

Strategic Environmental Assessment and Future Aggregates Extraction in the East Midlands Region

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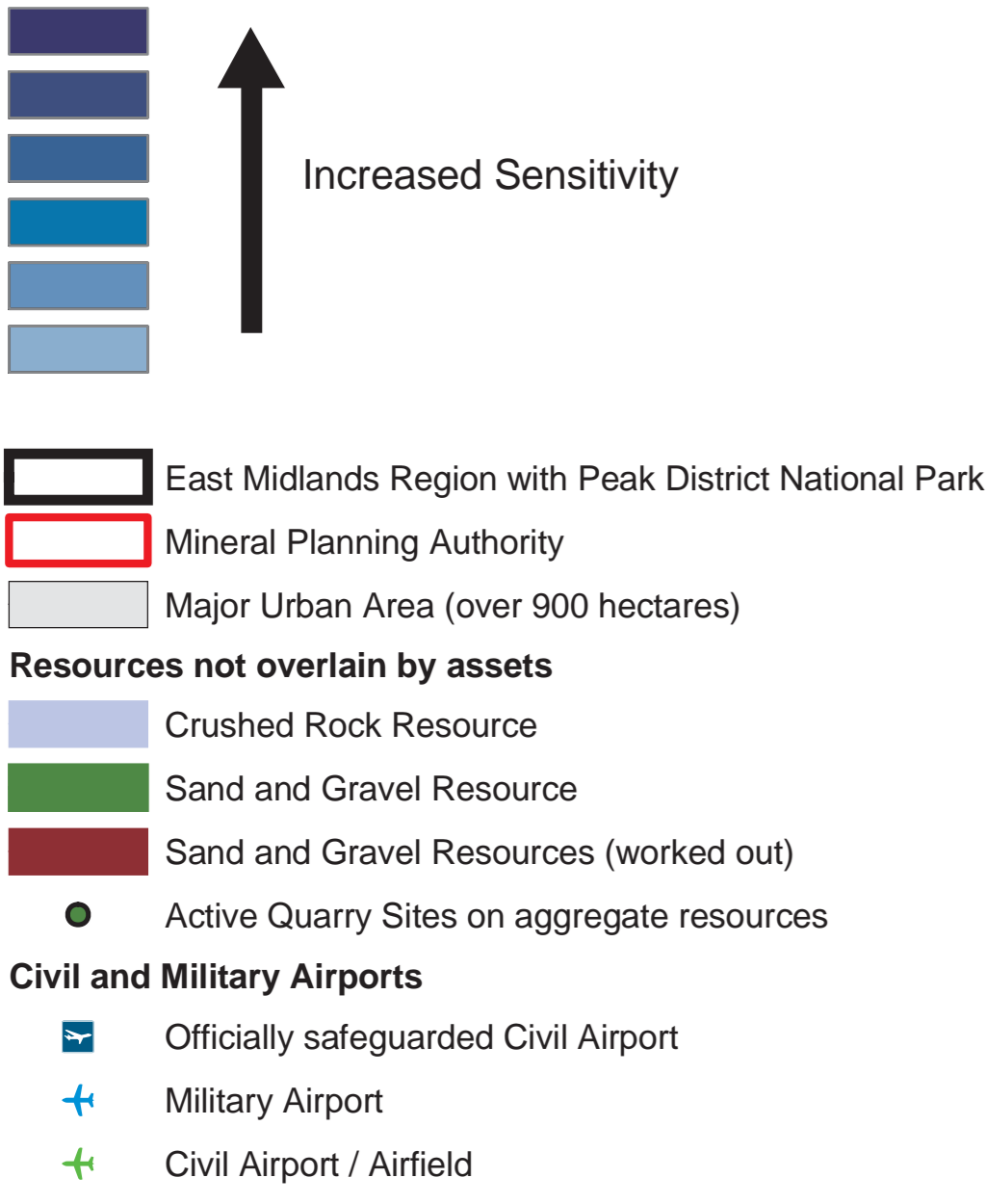
This Aggregates Levy project was co-funded by the British Geological Survey and the Mineral Industry Sustainable Technology Programme (MIST). MIST is managed by the Mineral Industry Research Organisation (MIRO) on behalf of the Department for Environment, Food and Rural Affairs (DEFRA).

Overview
Detailed information about the research behind this map can be found in Report CR/04/003N. The aim of the research was to contribute to the process of Strategic Environmental Assessment (SEA) by providing a non-prescriptive tool to aid the understanding of the relationship between aggregate resources and the environmental and the cultural assets that overlay them. The research aimed to achieve this through the production of a map entitled a 'future aggregates sensitivity map'.

The map was developed and produced through various stages that were integrated using a Geographical Information System (GIS). These stages involved: the development of a method for identifying and scoring environmental and cultural assets; the identification of aggregate resources in the study area; the development of GIS methodologies that could integrate the numerous data layers into one layer for display on the map; and finally stakeholder consultation. The East Midlands Region including the Peak District National Park was chosen as the trial study area in order to test the methodology. The method could however, be applied to other regions.

Following the comments and discussion at the stakeholder workshop in November 2003 re-evaluation of the analysis and presentation of the data was considered appropriate. Alternatives were explored using the county scale as opposed to a regional scale, which enabled results to be generated more quickly. The maps of Nottinghamshire demonstrate these alternatives.

East Midlands Regional Data

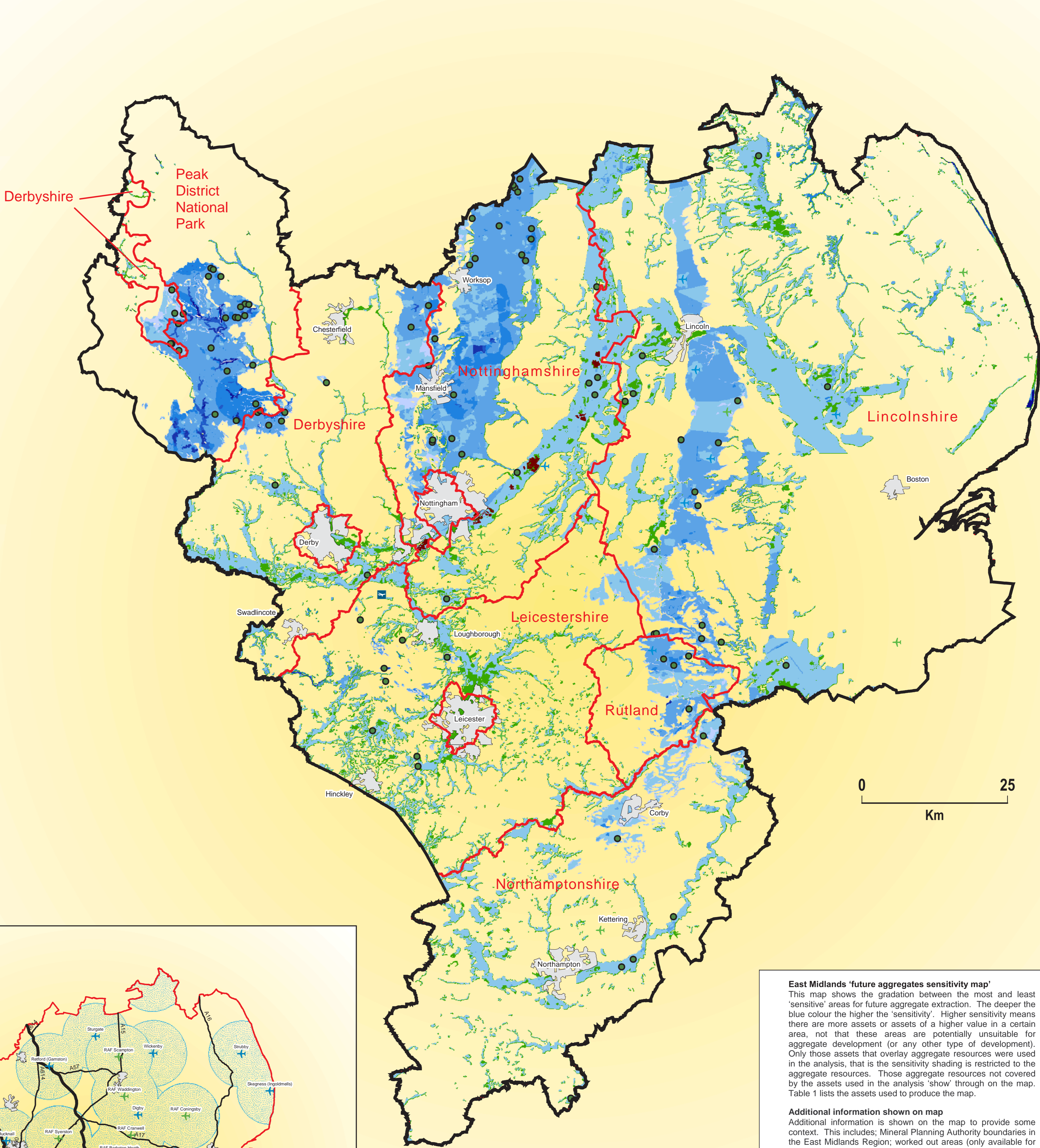


What are environmental and cultural assets?
In theory, assets can be defined as anything on which society places a value, or from which something of value arises. Consequently, when considering land underlain by aggregate resources, the list of potential assets is extensive. The focus here was on assets that could reasonably be defined as either environmental or cultural in nature. Defining the relative significance of each asset is potentially a highly subjective and contentious task and a number of methods were used to minimise the subjective element and link asset weighting to one or more externally validated 'anchor points'. For each asset the policy and law, and planning guidance and regulations, were reviewed in order to ascertain each component's relative importance or significance. The East Midlands Regional map was created using the data layers listed in Table 1.

Assets are not necessarily constraints on aggregates development and have not been treated as such in this research. The map produced in the research merely indicates where in the study area the most important or significant areas are, in terms of environmental and cultural assets. Higher sensitivity simply means there are more assets or assets of a higher value in a certain area, not that these areas are potentially unsuitable for aggregate development (or any other type of development).

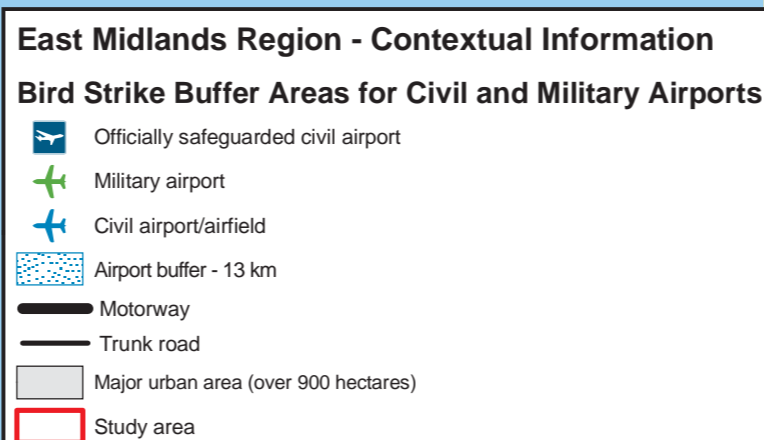
Table 1 Environmental & cultural assets used		
Assets used		Score
Agricultural Land: Likelihood of Best & Most Versatile Land; High, Medium, Low		8,6,4
Ancient Woodland		6
Area of Outstanding Natural Beauty		8
Community Forest		4
Groundwater Source Protection Zones 1, 2, 3		8, 8, 7
Millennium Green		7
National Forest		6
National Nature Reserve		8
National Park		8
Ramsar Wetlands		10
RSPB Important Bird Areas		8
RSPB Reserve		4
Scheduled Ancient Monument		8
Woodland Trust Site		4
Site of Special Scientific Interest (SSSI)		8
SSSI 2km buffer		4
Special Protection Area		10
Special Area of Conservation		10

'Future Aggregates Sensitivity Map'



East Midlands 'future aggregates sensitivity map'
This map shows the gradation between the most and least 'sensitive' areas for future aggregate extraction. The deeper the blue colour the higher the 'sensitivity'. Higher sensitivity means there are more assets or assets of a higher value in a certain area, not that these areas are potentially unsuitable for aggregate development (or any other type of development). Only those assets that overlay aggregate resources were used in the analysis; that is the sensitivity shading is restricted to the aggregate resources. Those aggregate resources not covered by the assets used in the analysis 'show' through on the map. Table 1 lists the assets used to produce the map.

Additional information shown on map
Additional information is shown on the map to provide some context. This includes; Mineral Planning Authority boundaries in the East Midlands Region; worked out areas (only available for Nottinghamshire); active quarries (only shown where they overlay aggregate resources); Ordnance Survey urban areas (only large areas, over 900 hectares) and the location of civil and military airports. A smaller map of the East Midlands provides further contextual information. It too shows large urban areas and the location of civil and military airports, but it also shows; motorways; trunk roads (as defined by the Highways Agency) and 13 km buffer zones of civil and military airports that fall within the region.



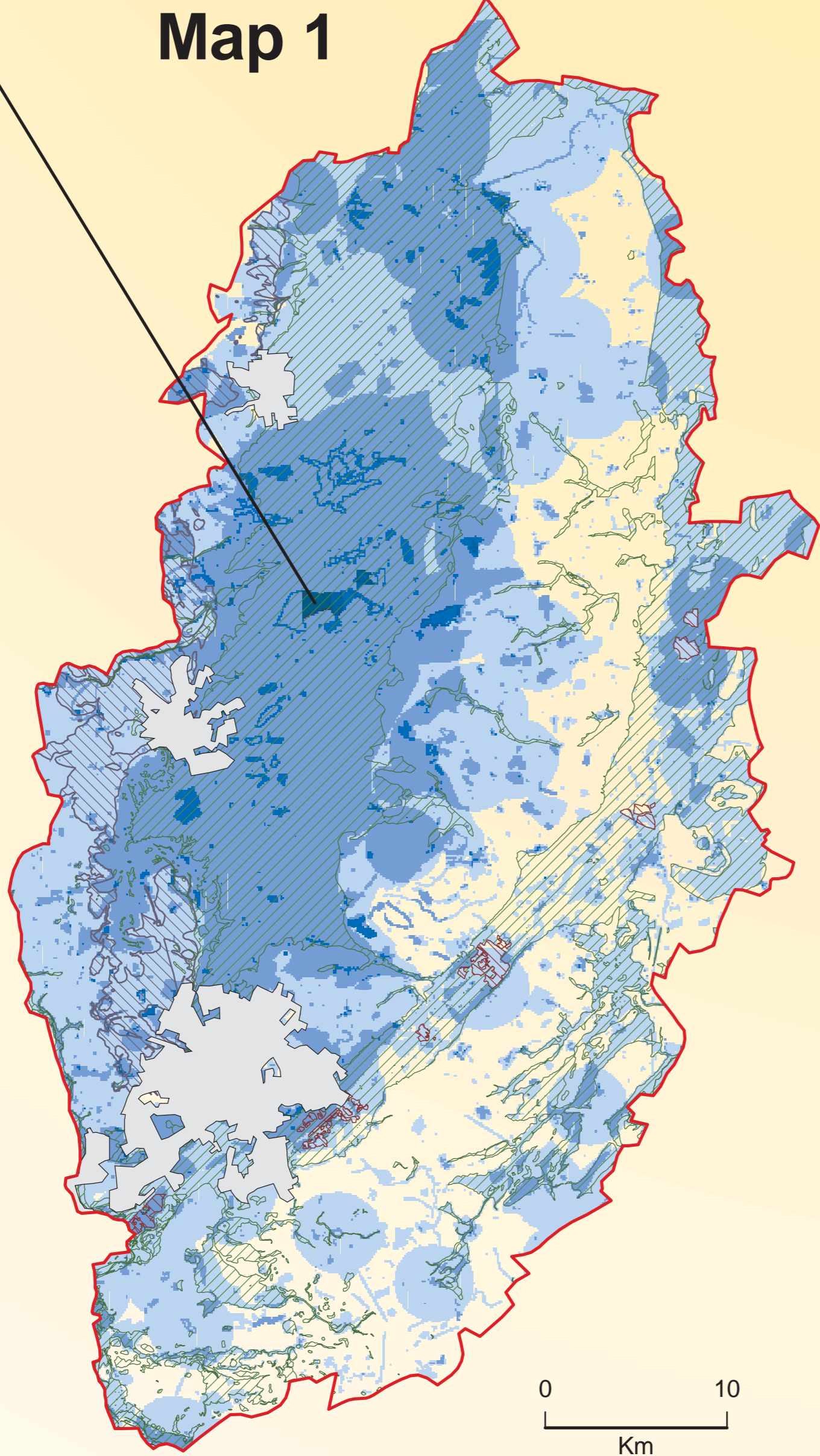
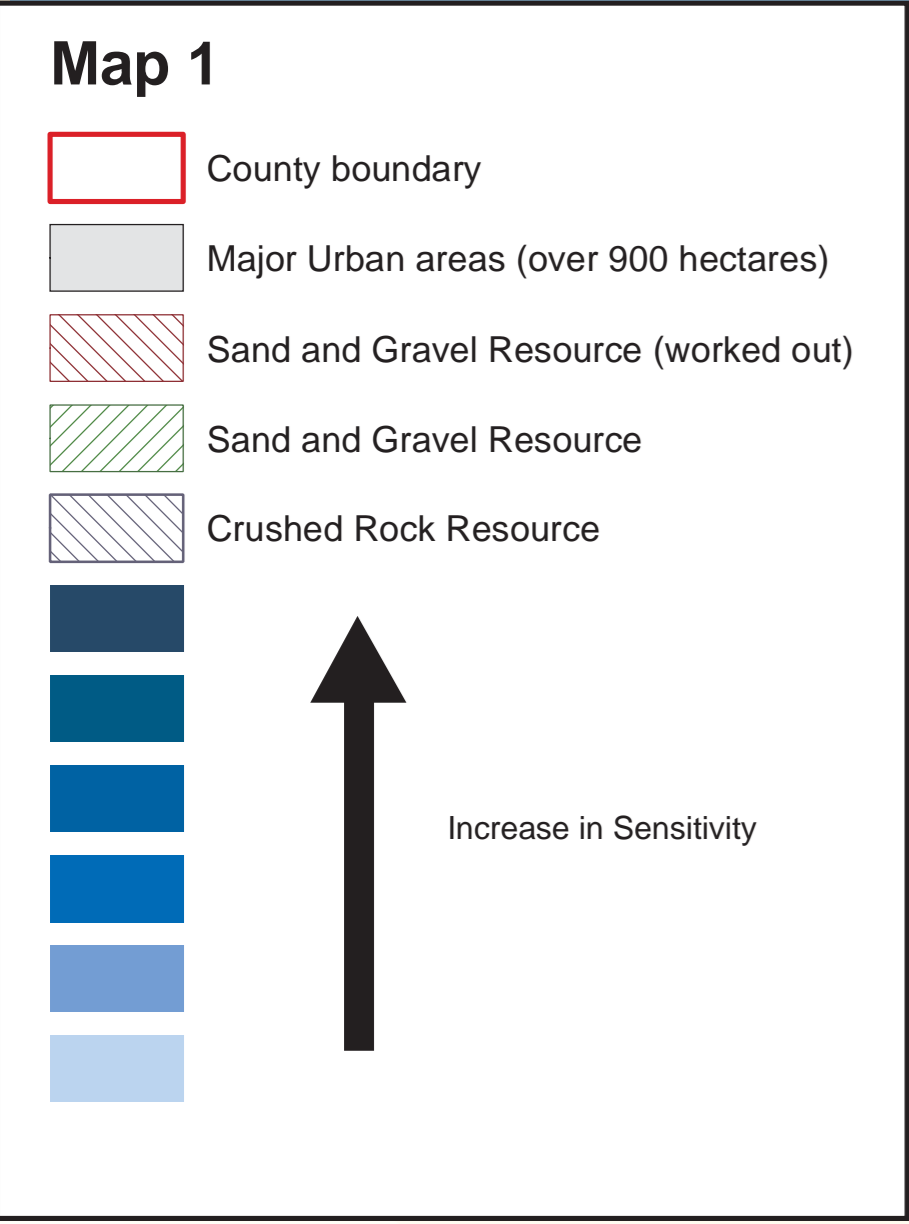
Limitations
The map produced here is for illustrative purposes only and should be used in conjunction with report CR/04/003N. The map should not be regarded as end product.
It is anticipated that the map will be visual tool for all stakeholders involved in the SEA of future aggregate plans. The map is intended for general consideration of aggregate issues at the regional scale, not as a source of detailed information on specific sites.
Local planners can provide detailed information if required. They can also provide their experience and local knowledge of non-mapped assets in their locality that may be important when considering future aggregates extraction.
Asset data are subject to change and are for indicative purposes only. Asset data were converted to a 1 hectare grid, which was aligned to the British National Grid. The map is limited to those assets that could be obtained digitally and freely or at a reasonable cost.

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The Nottinghamshire Maps include data reproduced from 'Alert Maps' supplied by Nottinghamshire County Council (NCC), Environment Department. NCC reserves copyright for the data supplied and used.

Identify Results		
Layers: <Top-most layer> [7]		
Location: [462636.799570 367244.339750]		Value
Field		
Ancient Woodland		0
Agricultural Land Classification		0
Area of Outstanding Natural Beauty		0
Community Forest		7
Ground Water Protection Zone		1
Millennium Green		0
National Forest		0
National Nature Reserve		8
National Park		8
Ramsar		0
Scheduled Ancient Monument		0
Site of Special Conservation		10
Special Protection Area		0
Site of Special Scientific Interest		8
Woodland Trust		0
Woodland Trust		0
Grade II Listed Building		0
Local Nature Reserve		0
Land Building		0
Other Historic Park		0
Registered Historic Park		0
Conservation Area		0
Wildlife Trust		4
Total Asset Score		53

Table 3
This table identifies a grid cell on Map 1. It is included to demonstrate the functionality of the GIS. The table shows the assets that are present and the score used for those assets in the grid cell. The total score for that grid cell is also displayed. It is possible to retrieve a range of information such as; who supplied the data and what authority or consulting body needs to be contacted about the assets in this particular grid cell.



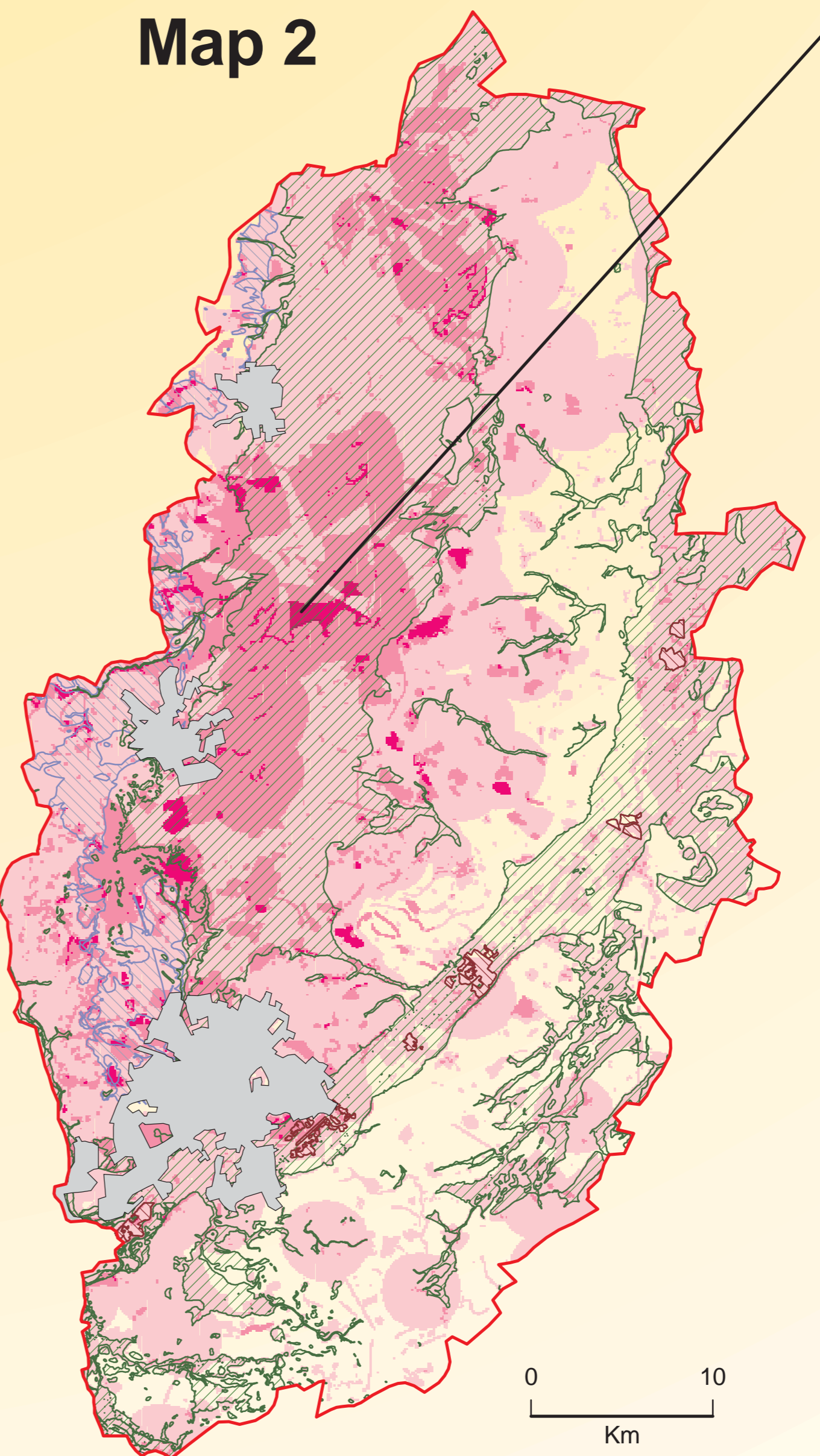
Map 1: Nottinghamshire 'sensitivity' map
This map uses the same methodology as the regional map but includes a wider range of local information. Also the asset data is not restricted to the outline of the aggregate resources. The supplementary datasets obtained from Nottinghamshire County Council (Table 2) were integrated into the original gridded data layer. A greater level of detail was obtained by using this supplementary local data. The inclusion of additional information also highlights the flexibility of the methodology, which can be implemented simultaneously on a regional and local scale. In addition it demonstrates the ease with which new data can be integrated into the system.

Map 2: Nottinghamshire 'frequency of assets' map
This map does not use the method of scoring assets. In response to the subjectivity of attributing scores to assets an alternative approach was tested. As for the Nottinghamshire 'sensitivity' map this method used the additional Nottinghamshire data (Table 2) and did not restrict the assets to the resources. The original 1 hectare vector grid was used to determine a simple presence or absence for each asset within each grid cell. The values in the grid represent the total number of assets for each given grid cell. This total is converted to a graduated colour. The darker the colour the higher the number of assets in that grid cell.

Paper output versus GIS
GISs are powerful tools that can integrate, display, analyse and output information. It is not possible to convey the numerous and diverse spatial information that was analysed in this research on a paper map. All the information collated and analysed in this research is held within a GIS. The next logical step might be to provide this data in a GIS of some sort. The user will than be able to interrogate the information behind the values on the maps. Some functionality of the GIS is shown here. Tables 3 and 4 are attribute tables that identify a grid cell on the Nottinghamshire maps. Each table shows some of the information held within the GIS.

Table 2 Additional local assets used		
Assets used*	Score	
Grade 2 Listed Buildings		8
Listed Buildings		8
Local Nature Reserves		4
Conservation Area		4
Other Historic Park		4
Registered Historic Park		4
Sites of Important Nature Conservation		2
Wildlife Trust		4

* These were supplied as 'Alert' files by Nottinghamshire County Council, Environment Department. The data supplied is not the most up to date, and is for indicative purposes only.



Identify Results		
Layers: <Top-most layer> [7]		
Location: [462658.430764 367248.272895]		Value
Field		
Ancient Woodland		1
Agricultural Land Classification		0
Area of Outstanding Natural Beauty		0
Community Forest		1
Ground Water Protection Zone		1
Millennium Green		0
National Forest		0
National Nature Reserve		0
Ramsar		0
RSPB Reserve		0
RSPB Reserve		0
Scheduled Ancient Monument		0
Site of Special Conservation		1
Special Protection Area		0
Site of Special Scientific Interest		1
2 km buffer round Site of Special Scientific Interest		1
Woodland Trust		0
Grade II Listed Building		0
Listed Building		0
Other Historic Park		0
Registered Historic Park		0
SNIC (confirmed)		1
Conservation Area		1
Wildlife Trust		1
Number of Assets		8

Table 4
This table identifies a grid cell on the Map 2. It is included to demonstrate the functionality of the GIS. The table shows the assets that are present (denoted by the number one) and those that are absent (denoted by a zero) for a given grid cell in Nottinghamshire. The total number of assets for that grid cell is also displayed. It is possible to retrieve a range of information such as; who supplied the data and what authority or consulting body needs to be contacted about the assets in this particular grid cell.

