

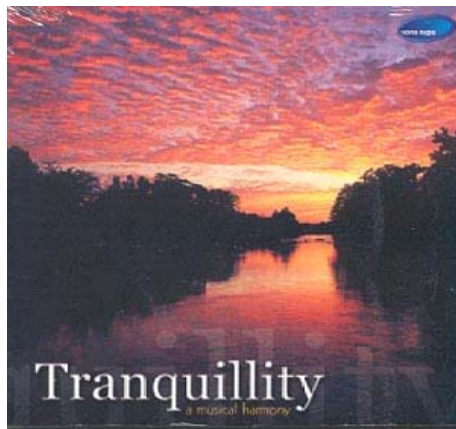
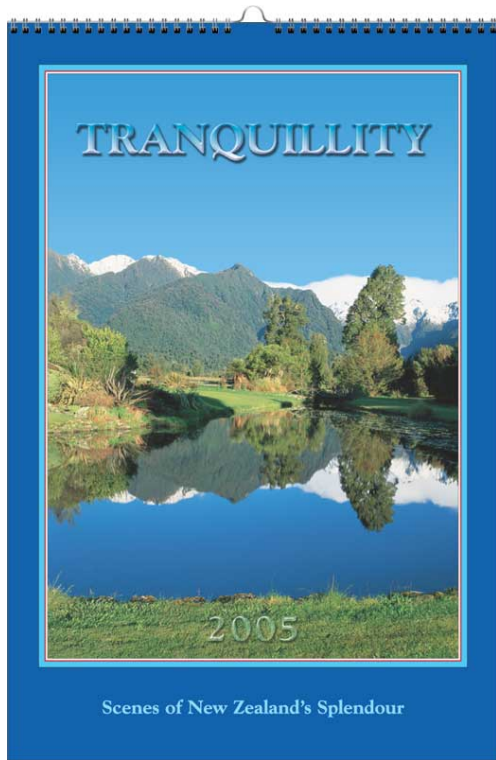
**Landscape Indicators, Challenges and Perspectives
International Seminar 29th – 30th November 2007**

Tranquillity as an Indicator of Landscape Quality

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Key Questions

- 1) Why is tranquillity important?**
- 2) How can it be measured and used as a reliable, robust indicator?**



Tranquillity and Health

- Beneficial effects on **health, well-being,** and **state of mind** of being in particular environments
- Allowing relaxation, restoration, fascination – places distinct from normal
- Places that are tranquil have these benefits
 - Allow a chance to recover from the stresses and strains of everyday life





The UK Government Rural White Paper

Chapter 9: Conserving and enhancing our countryside

The future: what we want to see:

- **Reduced pressures for greenfield development.**
- **There will be stronger protection for our most valued landscapes.**
- **Increased measures will be taken to promote tranquillity.**
- **Trees, woods and forests will have a more prominent place in the countryside.**



Use of ‘tranquillity’ in policy

Government Office for the North East (2002):

“Tranquillity is an important part of our countryside character”

- Development plans should:
 - 1) “..**identify** those areas where the maintenance of tranquillity is both important and practical..”
 - 2) “..**protect** and, where appropriate, **increase** tranquil areas throughout the region when formulating policies for land-use, transport, and traffic management..”

East of England Regional Development Agency
(2004):

“The plan is likely to have serious negative impacts on water resources, biodiversity, tranquillity, air quality, recreational access, and congestion”



‘Indicators’ of Quality

- **How is tranquillity to be identified, protected and increased?**
- **Need to be able to measure impact and change (positive and negative)**
- **Need for measurement tools... Indicators...**
- **Importance of quantitative measures of landscape attributes for government policy:**
 - e.g. length of hedgerows, air pollution, water quality, woodland losses, SSSI conditions, condition of monuments, etc.
- **But – is the feeling of ‘tranquillity’ something that can be measured using quantitative data...?**

Measuring experiences of landscape

Developing a robust and useful indicator, that addresses the innate subjectivity of the experience of tranquillity

Two related areas of research:

- on how people react to and feel about aspects of the environment
 - on how these can be assessed and mapped
1. **Definition and experience of landscape are subjective**
 - Research on 'wilderness' and 'naturalness'
 - Experiences of the 'same' environments vary according to perceptions, cognition, emotions, values, attitudes
 2. **Subjectivity does not make such concepts impossible to measure**
 - Studies 'break down' the concept and develop a set of criteria, the presence or absence of which lead to a 'wilderness' or 'natural' experience
 - "What might be regarded as very personal imagery can, in fact, be collected and used as a potential management tool" (Kliskey and Kearsley, (1993:203)



Literature: engaging people

But - what is often missing from these studies is engagement with people

- Asked about expert devised criteria
- Perceptions and definitions vary between experts and lay people
- Criteria may undervalue affective responses or the value placed on landscapes

Summary so far..

- Need for indicators
- Landscape is experienced experientially
- This experience can be measured



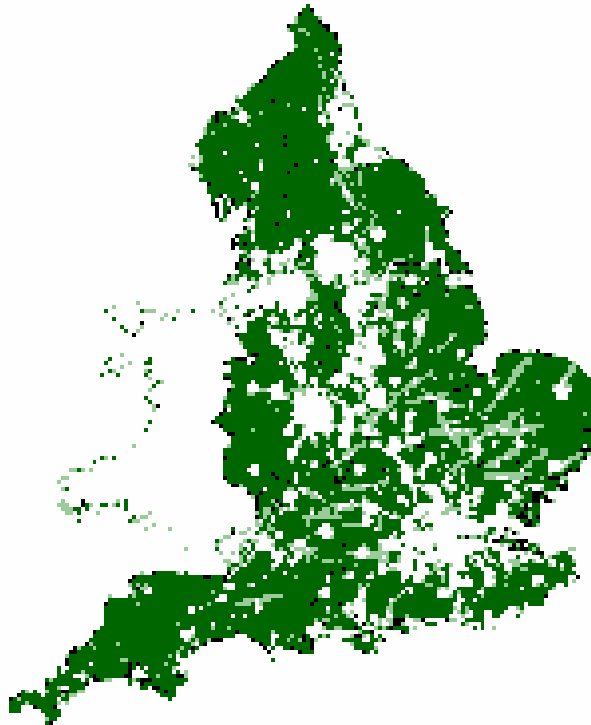
Previous Tranquillity Mapping

- Application to measuring tranquillity..
- *CPRE and the Countryside Agency (1995):* ‘places which are sufficiently far away from the visual or noise intrusion of development or traffic to be considered unspoilt by urban influences’
- Such places were determined by calculating the distances from various disruptive factors
- Decided that a Tranquil Area lay:
 - 4km from the largest power stations
 - 3km from the most highly trafficked roads, large towns and major industry
 - 2km from most other motorways and major trunk roads and smaller towns.
 - beyond military and civil airfield/airport noise lozenges
- Result: mapping of tranquil and vulnerable areas

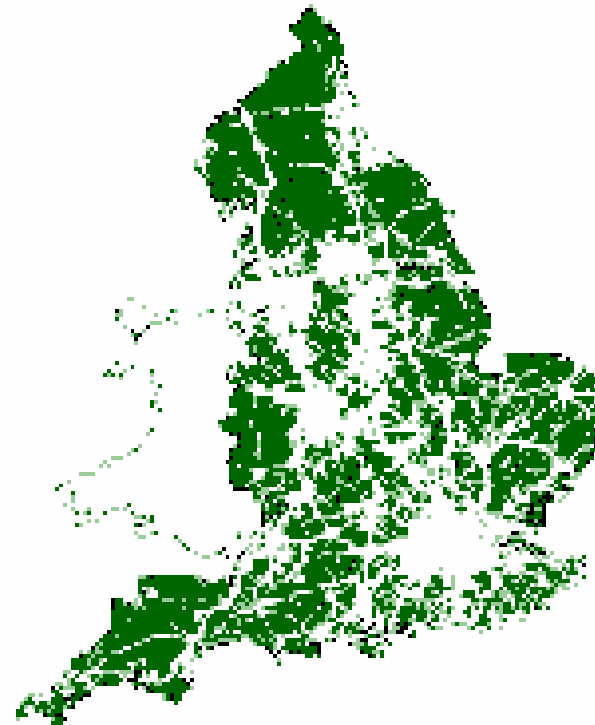


CPRE/CC 1990s Maps

Early 1960s



Early 1990s



Tranquil areas



Vulnerable areas (tranquil areas with some intrusion/disturbance)

Previous Tranquillity Mapping ctd

- ***The Forestry Commission (1999):***
 - absence of noise and visual impacts
 - ‘naturalness in the countryside’: tranquillity could be summed up as “the quality that allows us to feel that we have ‘got away from it all’”
- ***Number of criteria:***
 - Noise from roads, railways, airports, low-flying aircraft, powerboats, blasting and industrial sites;
 - Visual intrusion from built-up areas, industrial sites, power stations, overhead lines, airfields, derelict land, windfarms;
 - Recreational use: numbers of visitors, effects of facilities, car parking and associated noise and visual intrusion.



Critique of Previous Tranquillity Mapping

- **Previous work demonstrated the value of tranquillity mapping**
- **Critique of principles, data and methodology**
 - Use of simple thresholds
 - Insufficient attention to factors that do not occur on maps
 - No account taken of cumulative effects
 - Insufficient attention paid to intermittent and variable sources of disturbance
 - No account is taken of interactions between factors
 - Centrality of expert judgements



A new approach

Increasing volumes of data available

Increasing advanced techniques for data analysis

- **Using graduated thresholds**
- **Taking account of cumulative effects and interaction between variables**
- **Considering intermittent and variable factors**
- **Taking account of experiential factors as well as those on maps**
- **Not relying on expert judgements – using only those from people who use and experience different landscapes**
- **Levett: What is needed “is a measure of tranquillity that includes all, and only, those sources of disturbance which people feel actually damage tranquillity; and which weights them in proportion to peoples’ perceptions of their relative impacts on tranquillity” (2000:4).**





**Participatory
Appraisal**

Participatory Appraisal

- Form of community research that values local knowledge
- Emphasis on tools & techniques that are designed to allow participants to contribute on their terms

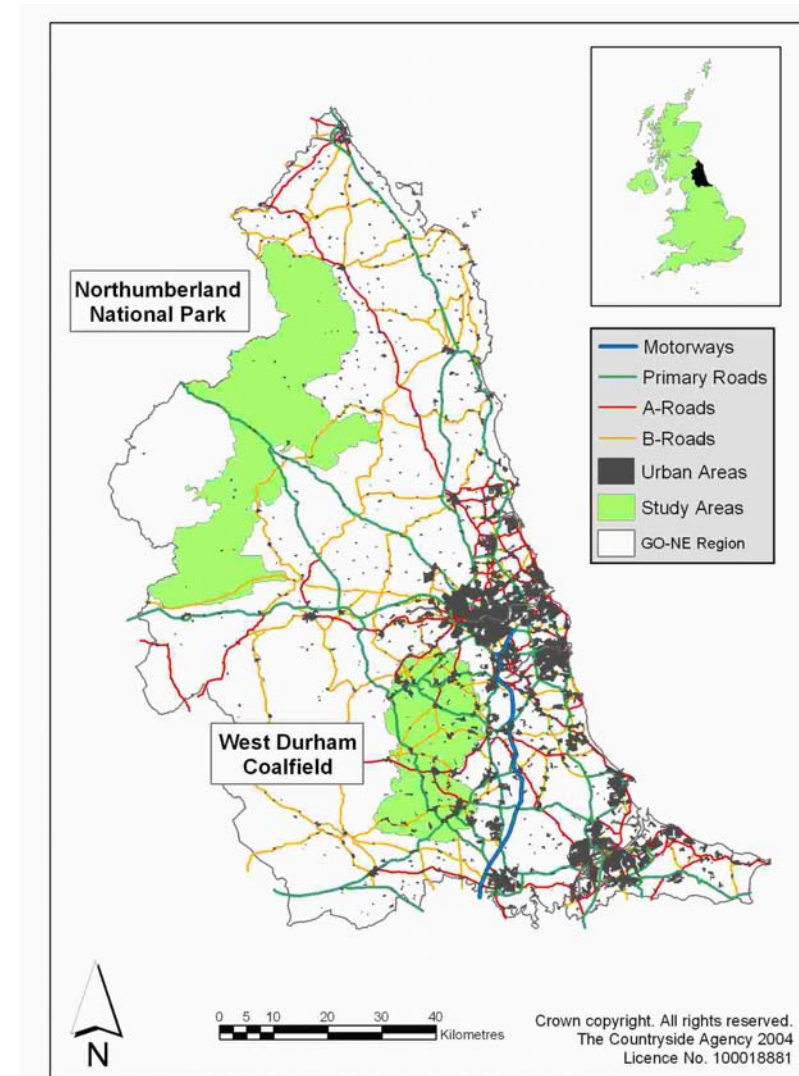


Participatory Appraisal Principles

- **Respect for local perceptions and choices**
- **Sympathy for local problems**
- **Humbleness on the part of external researchers**
- **Importance given to establishing a good rapport with local people**
- **Involvement of local people in planning the research**
- **The use of visual material**
- **An emphasis on the importance of feedback**
- **A focus on the application of the research for future improvements**

Study Areas

- **Northumberland National Park (NNP)**
 - England's least visited NP
 - Promotion rests on solitude, wildness & tranquillity
 - Internally varied landscape
 - WHS of Hadrian's Wall
 - MoD training
- **West Durham Coalfield (WDC)**
 - Densely populated
 - Dissected by roads, railways, etc
 - Substantial areas reclaimed land
 - Good access to the countryside



Participatory Appraisal Method

Stage 1:

Questions included:

- What is 'tranquillity'?
- What does it mean to you?
- Where can you experience it?
- What can you see, hear and feel?
- What detracts from tranquillity; what is NOT tranquillity?

Stage 2:

Through verification, the PA consultation defined:

- (a) what issues were important to people, and
- (b) their relative significance

Using the Data

The PA data was used to determine:

- **Whether tranquillity is important**
- **Why tranquillity is important**
- **What activities tranquillity is most associated with**
- **What visual things are positively associated with tranquillity**
- **What visual things are negatively associated with tranquillity**
- **What noises are positively associated with tranquillity**
- **What noises are negatively associated with tranquillity**
- **Which geographical areas are identified as being relatively tranquil**
- **What state of mind and experiences tranquillity is associated with**

Using the data: from perceptions to maps

Qualitative data from the PA sessions..

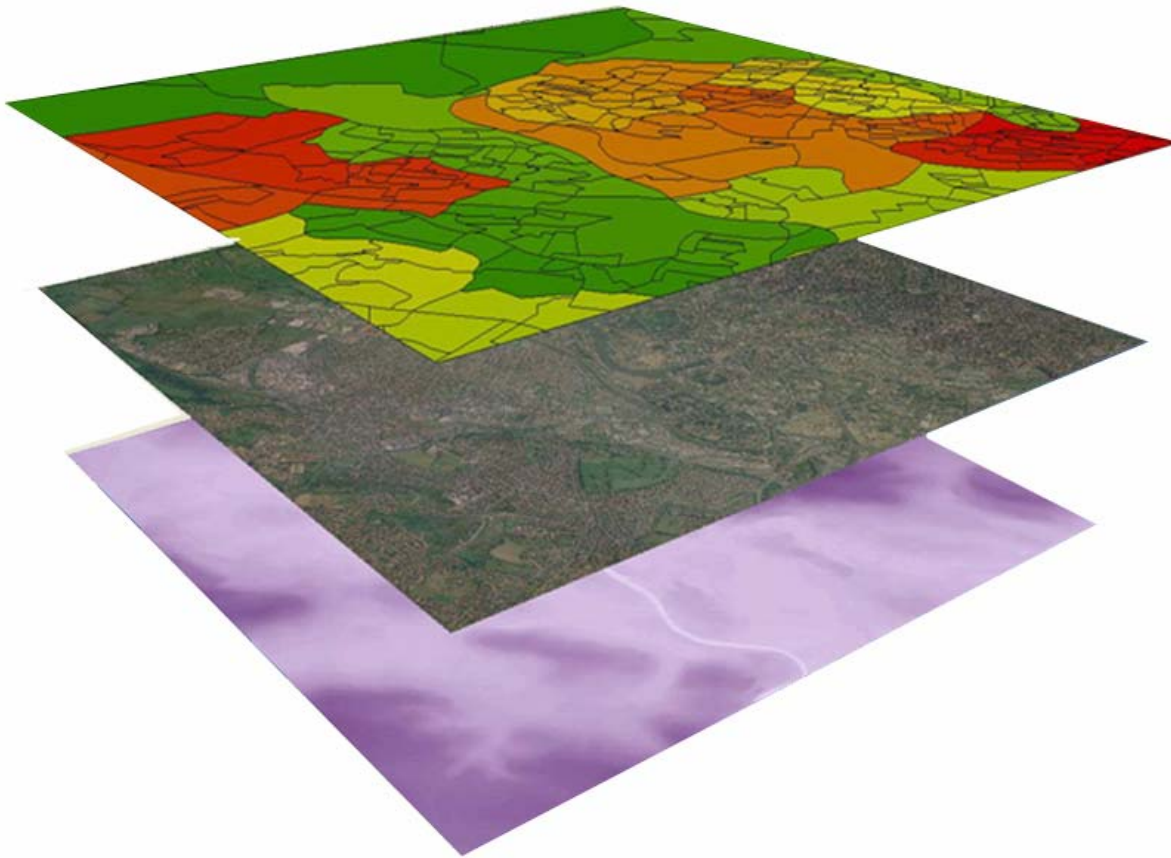
... categorised... into 3 main themes...

... and used in combination with GIS modelling techniques to produces maps of where people were more likely to be able experience tranquillity...



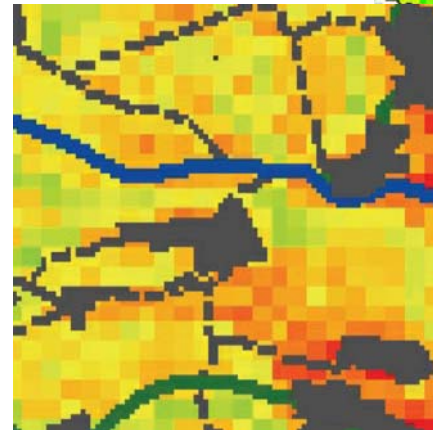
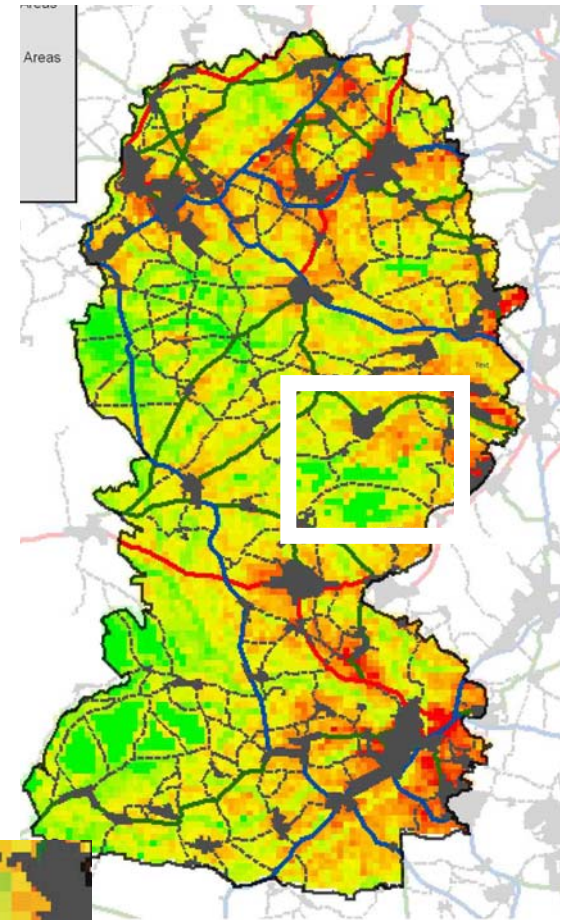
GIS Method

GIS handle, and analyse thematic 'layers' of data



GIS Method

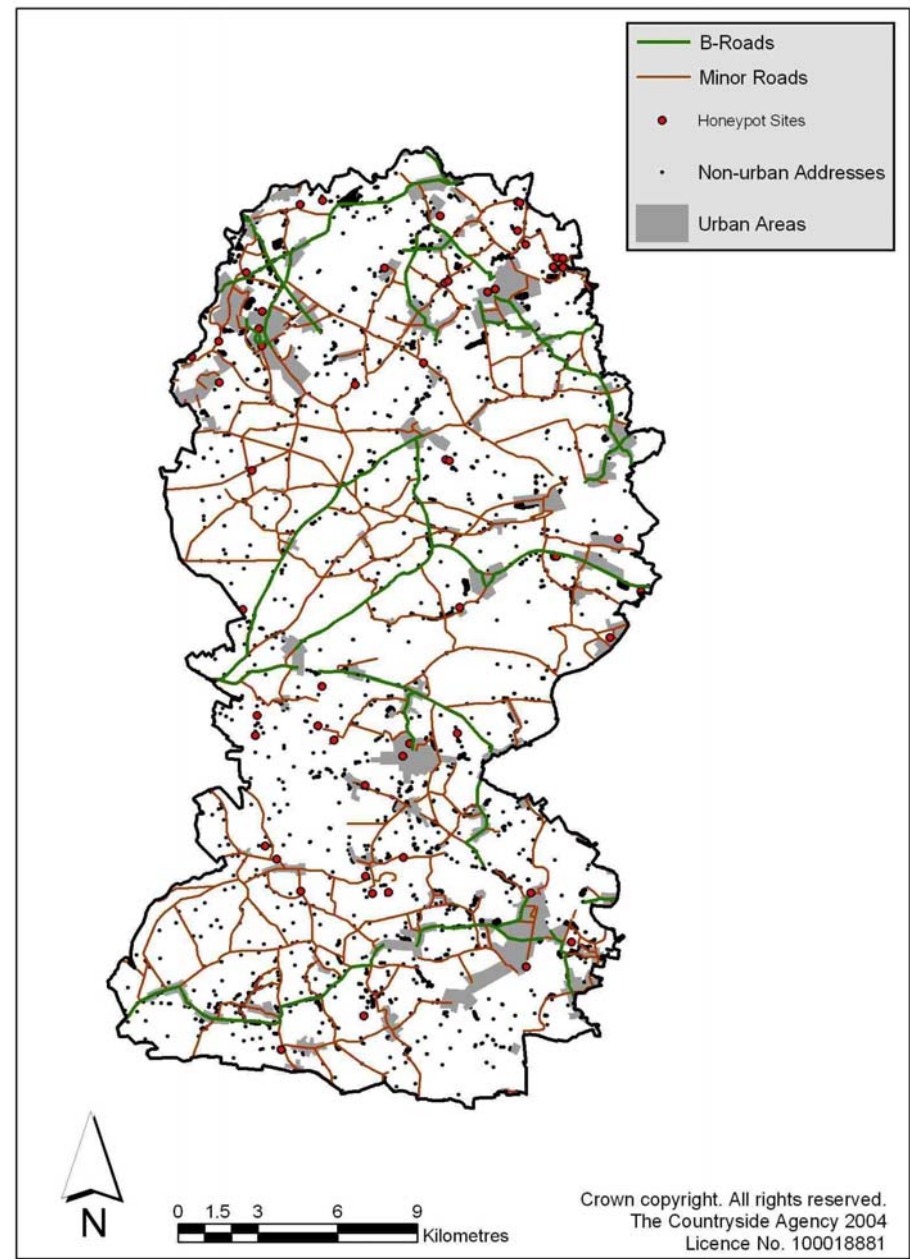
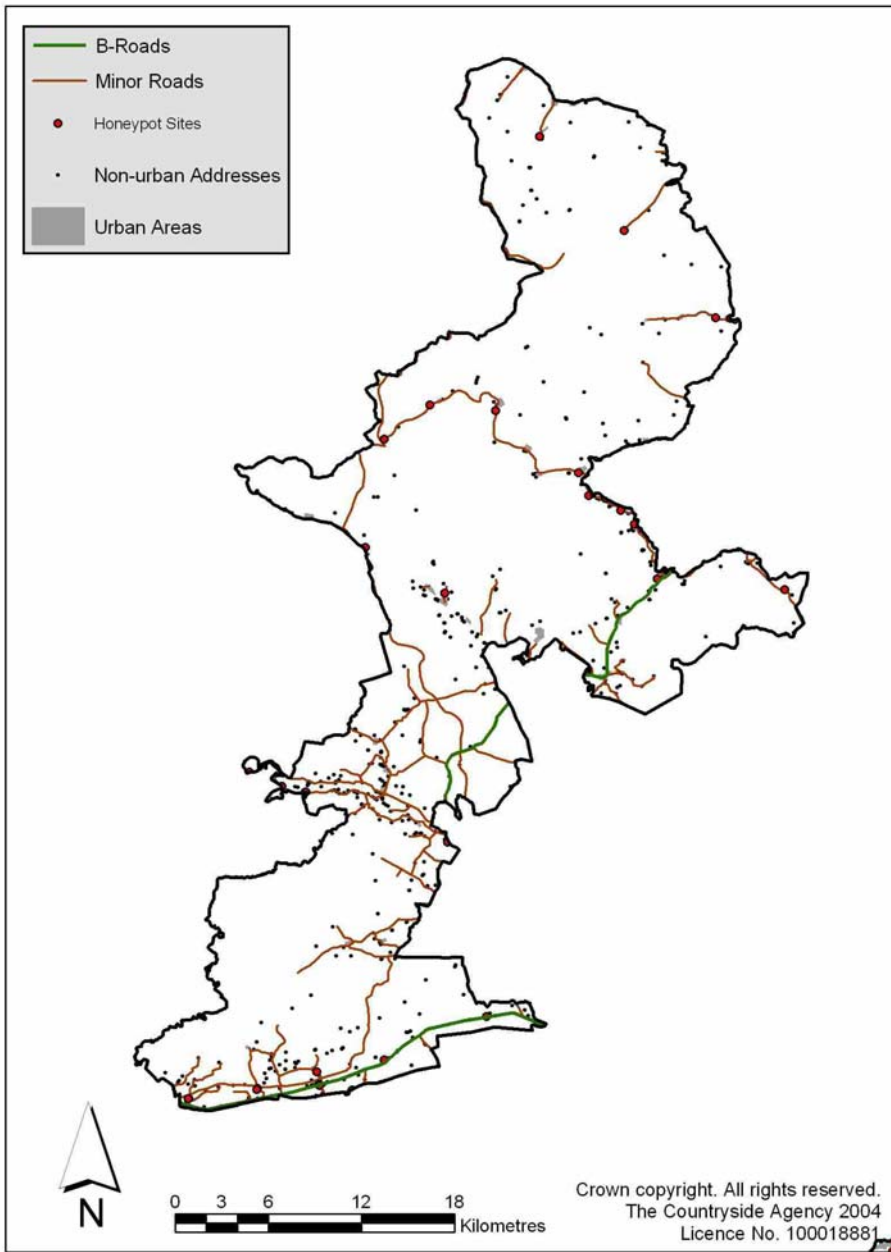
- Analysis of variables was carried out on many thousands of 'cells' of 250m x 250m
- Focus on nationally available datasets e.g.
 - Terrain (landform);
 - Urban Areas;
 - Isolated Settlements;
 - Countryside access points;
 - Public Rights of Way;
 - Power Pylons;
 - Wind turbines;
 - Roads by type and traffic;
 - Railways;
 - Quarries (explosions);
 - Artillery firing points

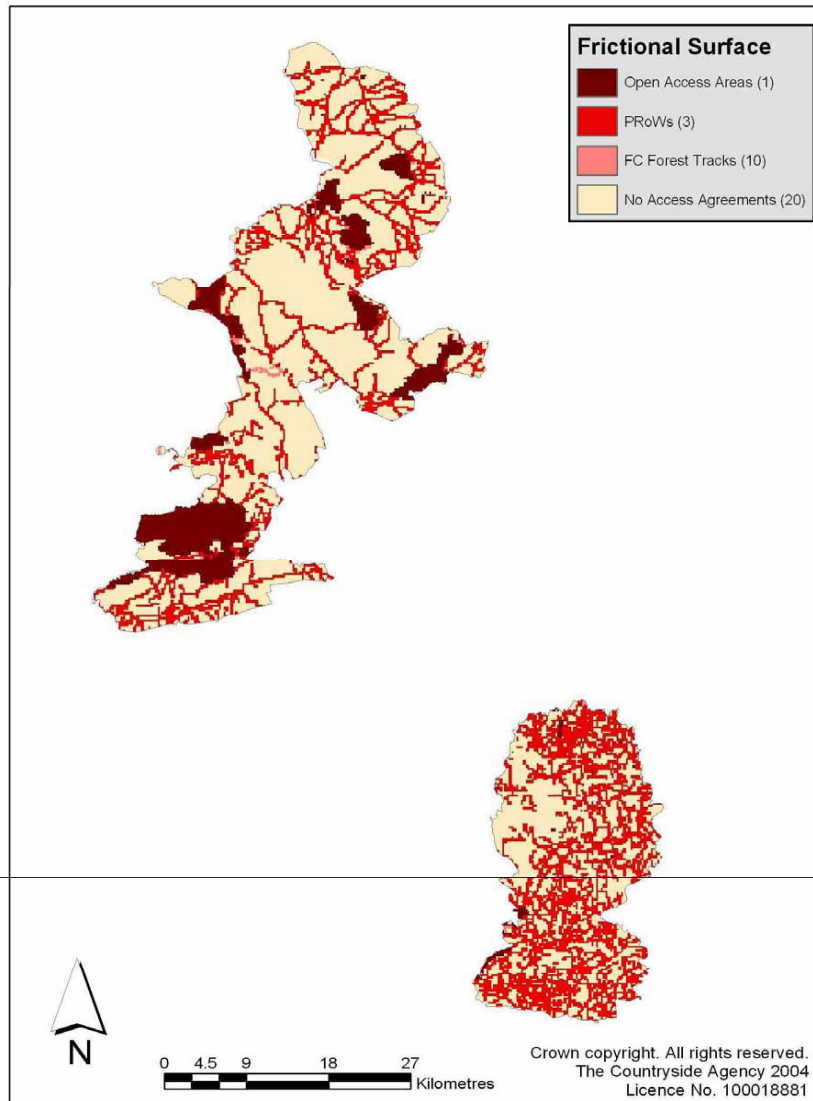


1) People

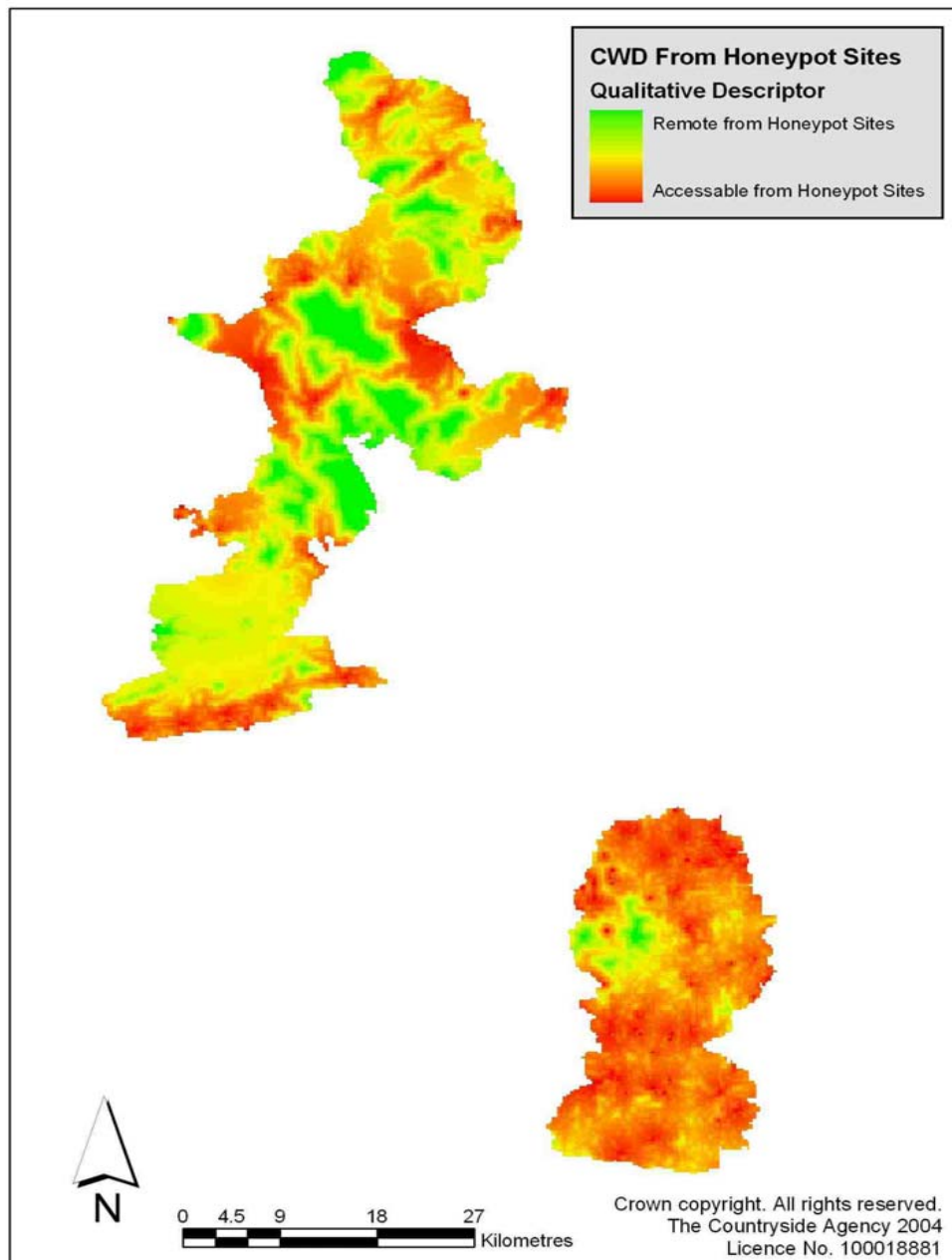
- There are many things about people and associated with people that detract from tranquillity e.g.
 - *Loutish behaviour*
 - *Dog dirt*
 - *Mobile phones*
 - *Rubbish*
 - *Loud Music*
 - *People shouting...*
- Modelling each of these very specific criteria was not viable, so the assumption was made that the detracting characteristics would increase with probability of meeting people.
- Key factors:
 - where people start from, and
 - where they get to



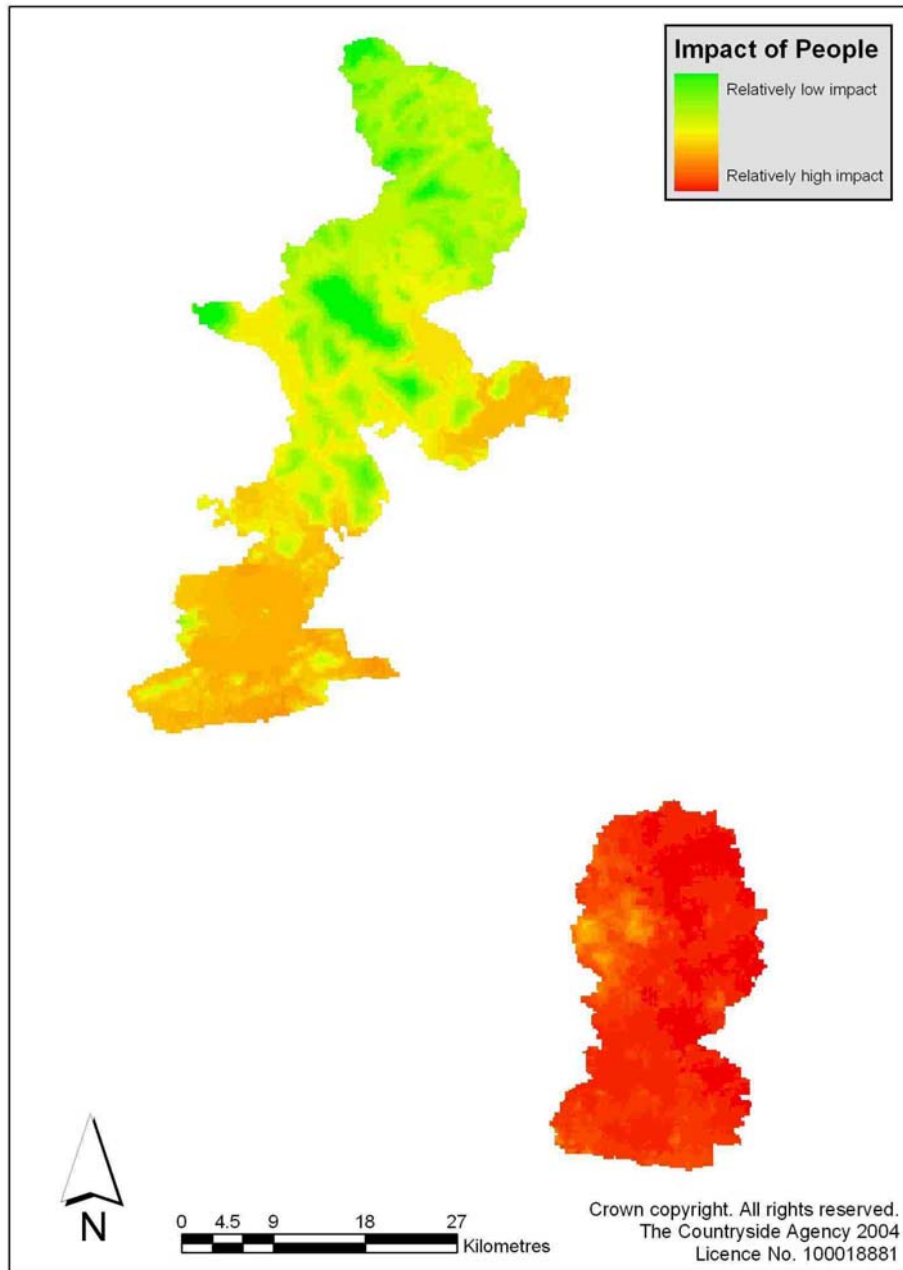




The Frictional Surface for Modelling



Modelled Diffusion Away from 'Honeypot' Sites



Modelled Impact of People

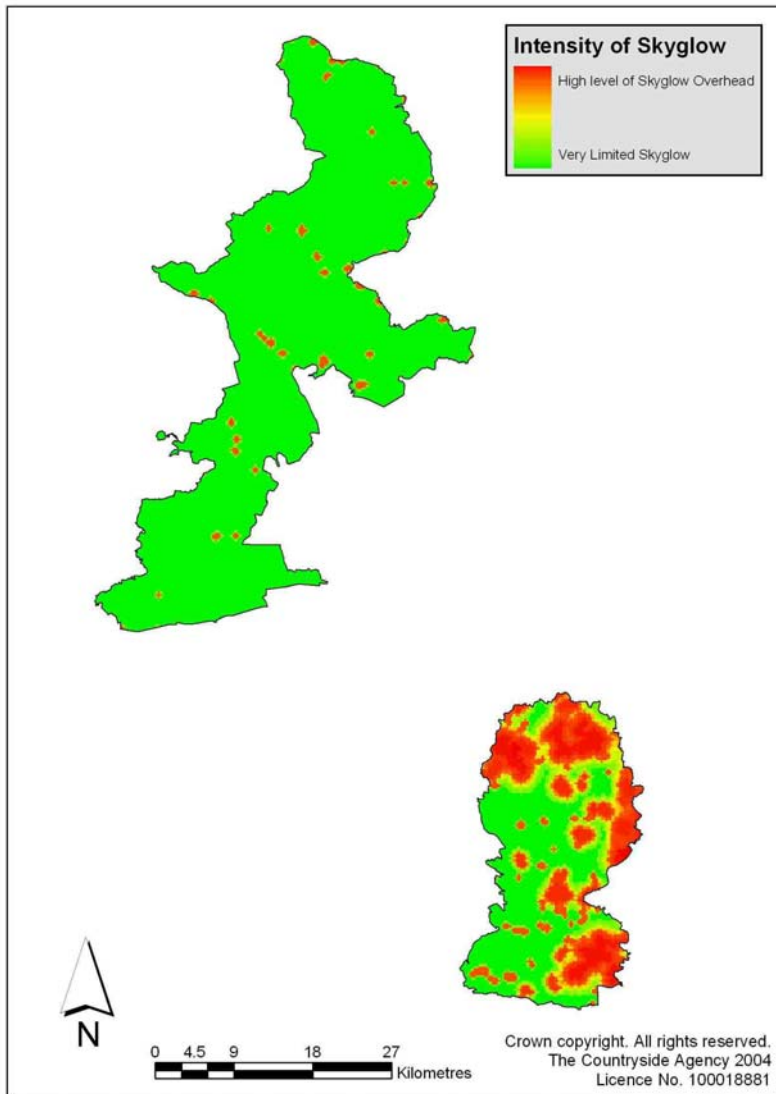


2) Landscape

- ✓ Openness
- ✓ Perceived Naturalness
- ✓ Presence & Visibility of Rivers
- ✓ Visibility of the Sea
- ✓ Visibility of Broad-leaved Woodland & Mixed Woodland
- ✗ Visibility of Roads, Urban Areas and other overt signs of Human Development
- ✗ Overhead Skyglow (Light Pollution)
- ✗ Visibility of Coniferous Plantations

Examples of Impacts on Perceived Naturalness

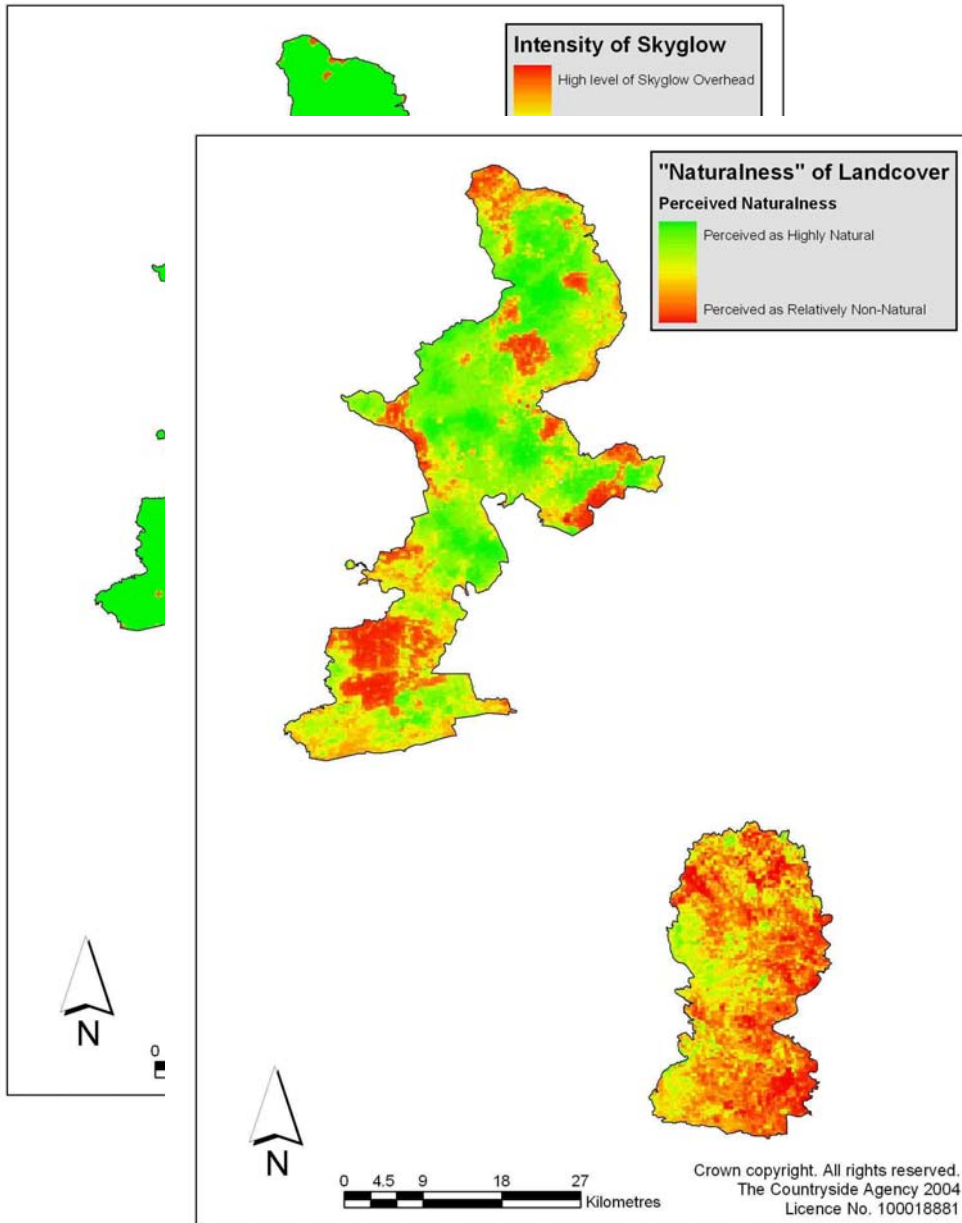
Overhead Skyglow at Night



Examples of Impacts on Perceived Naturalness

Overhead Skyglow at Night

Naturalness of Land Cover

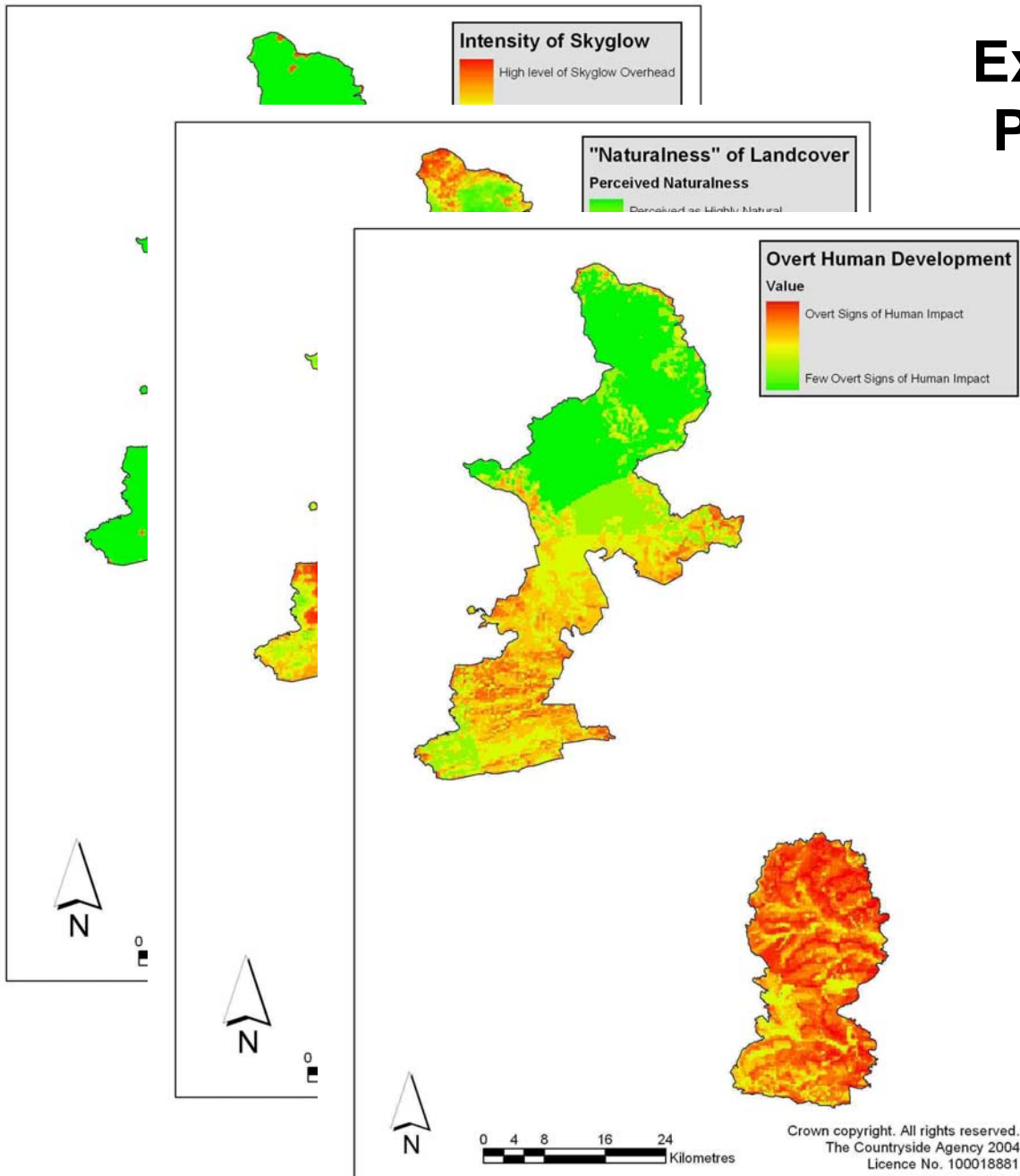


Examples of Impacts on Perceived Naturalness

Overhead Skyglow at Night

Naturalness of Land Cover

Overt Human Development

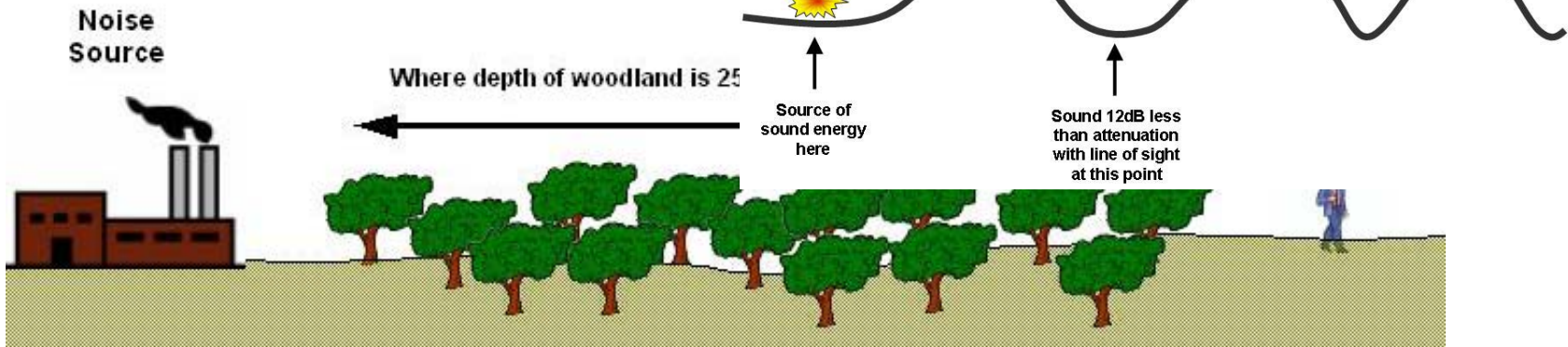
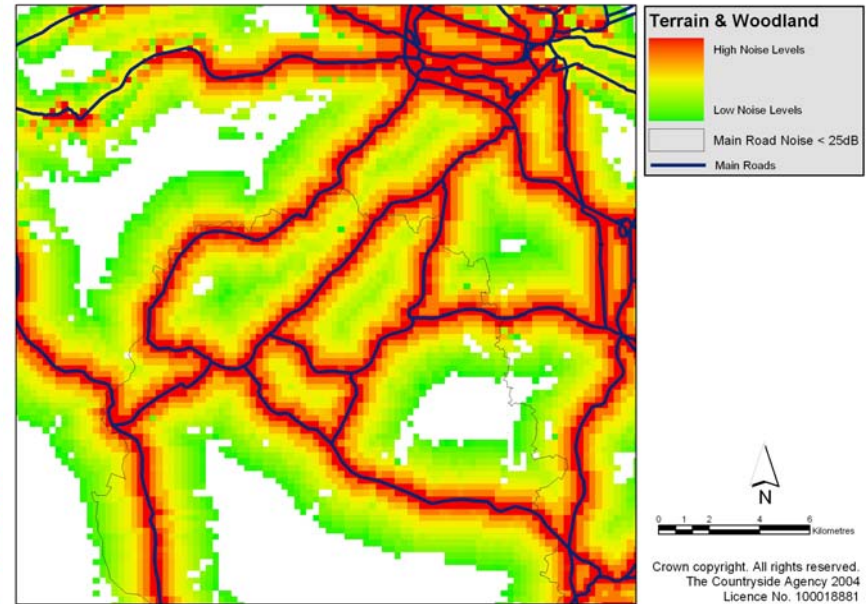


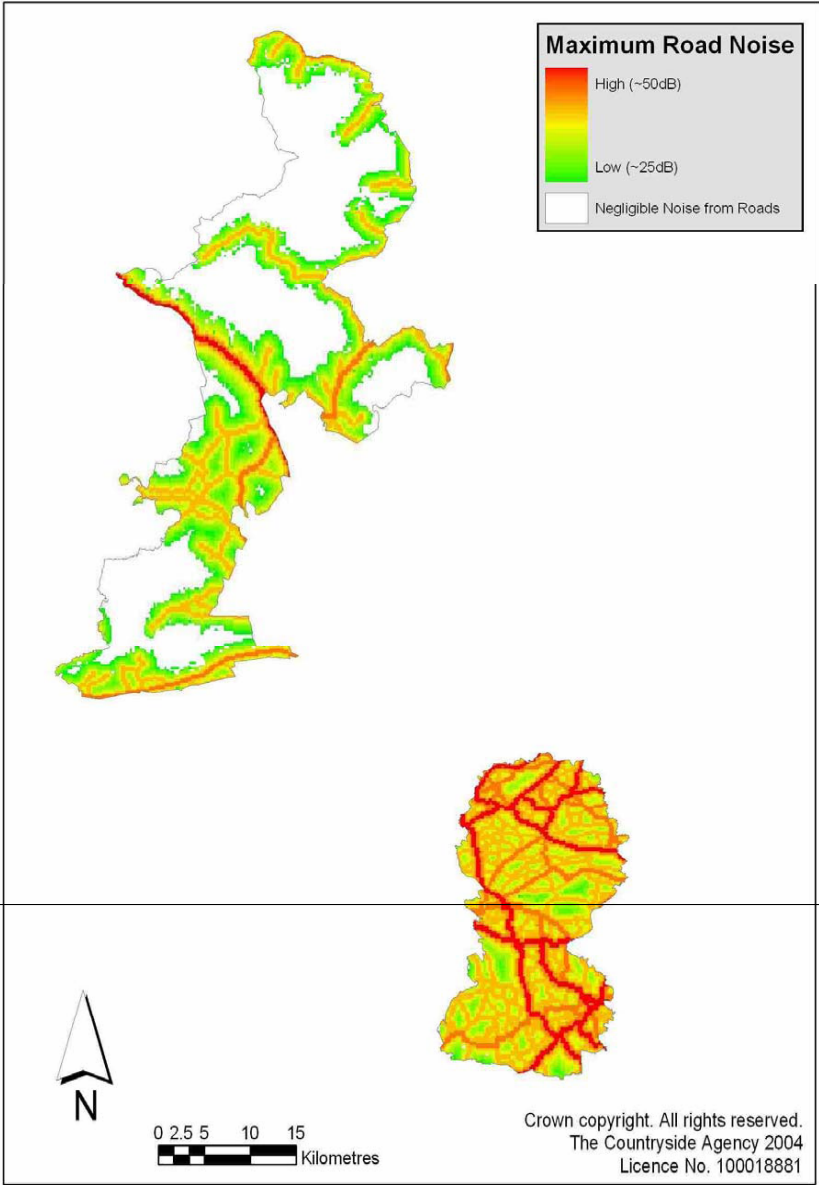


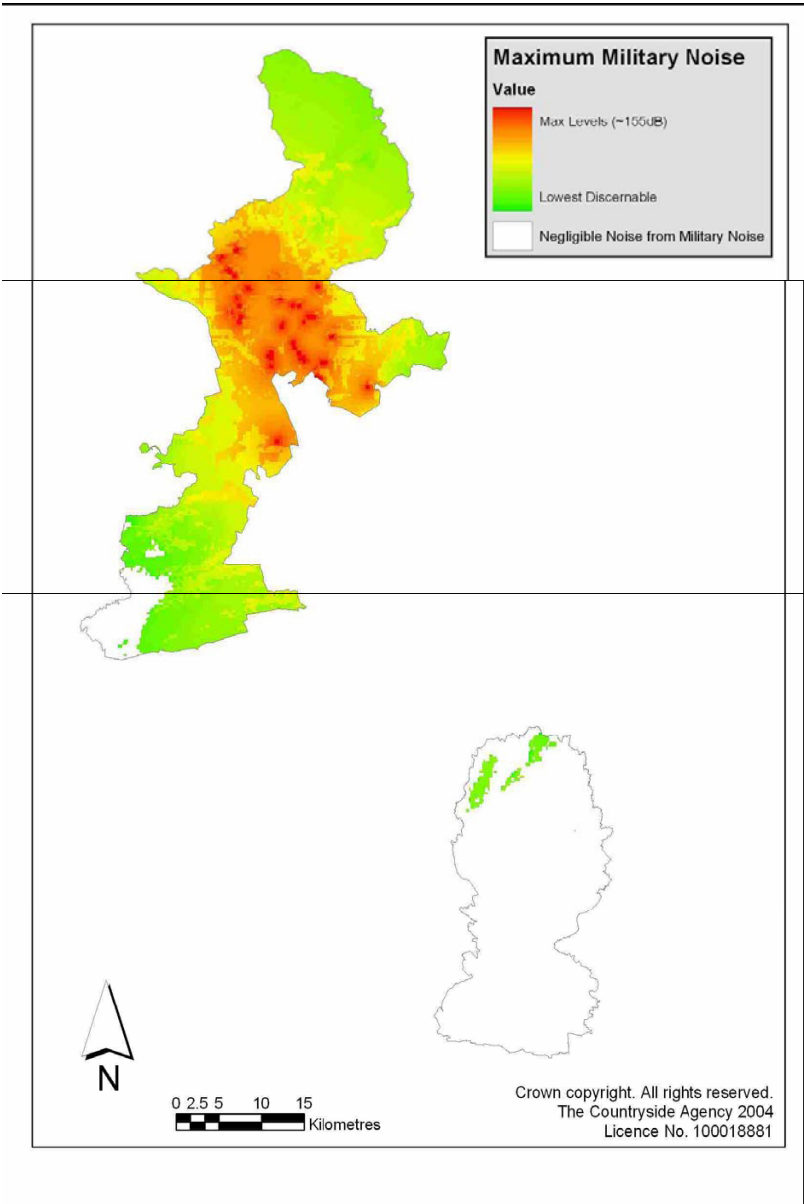
***Silence,
so you can hear
natural sounds...***

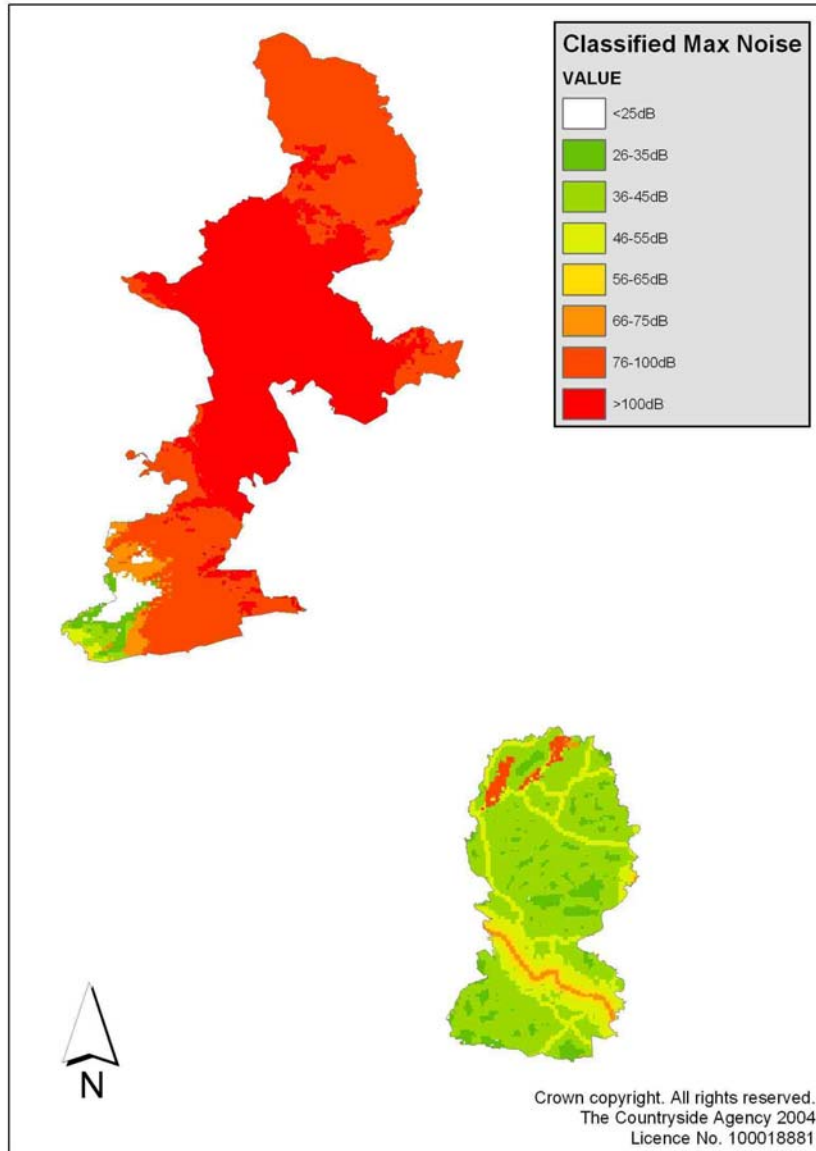
3) Noise

- Areas of low noise were closely associated with tranquillity (positive)
- Specific types of noise that were negative:
 - Road, train and urban
 - Aircraft noise (1.5% of –ve)
 - Military training (<1% of –ve)

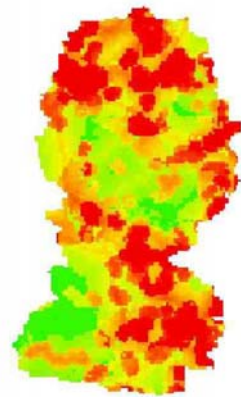
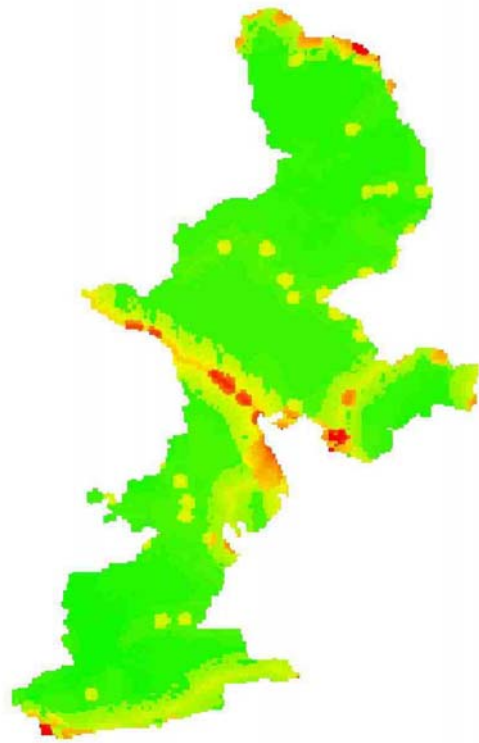




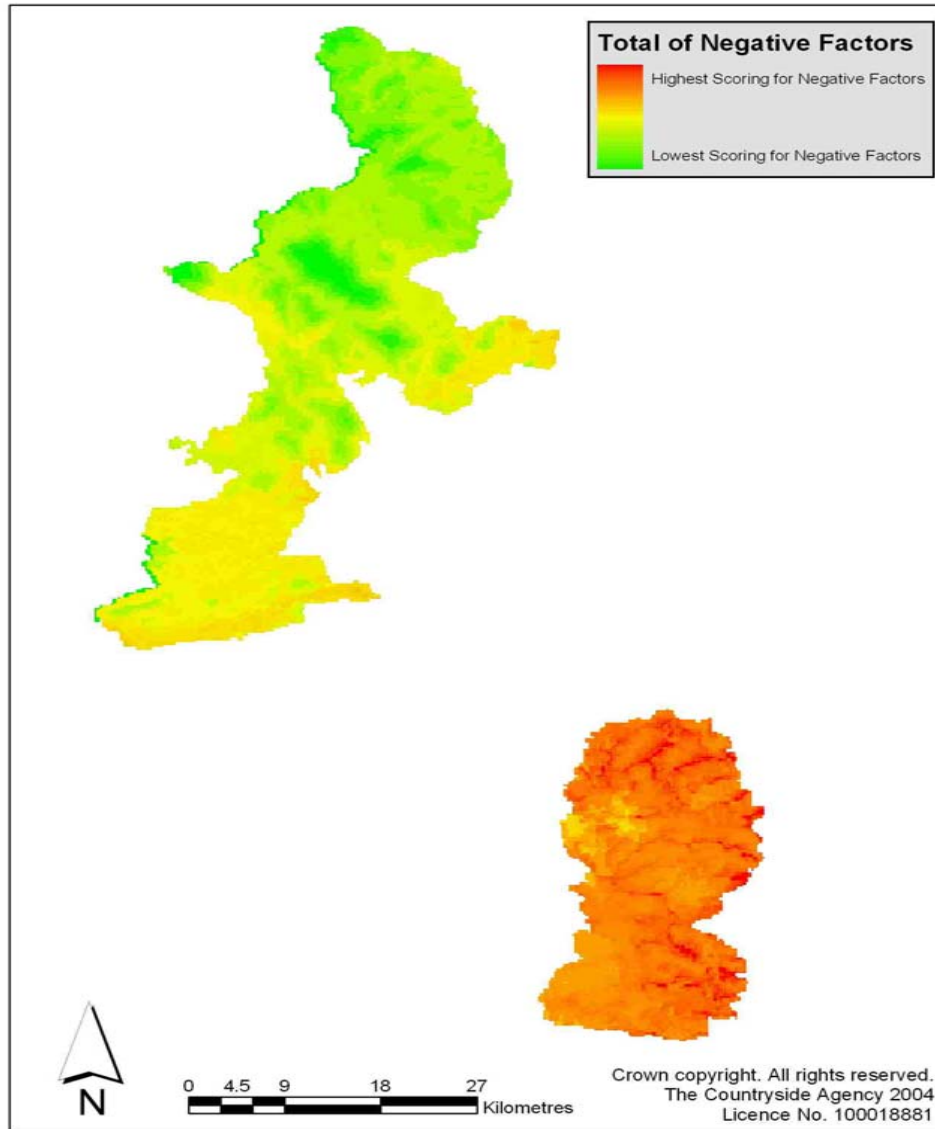


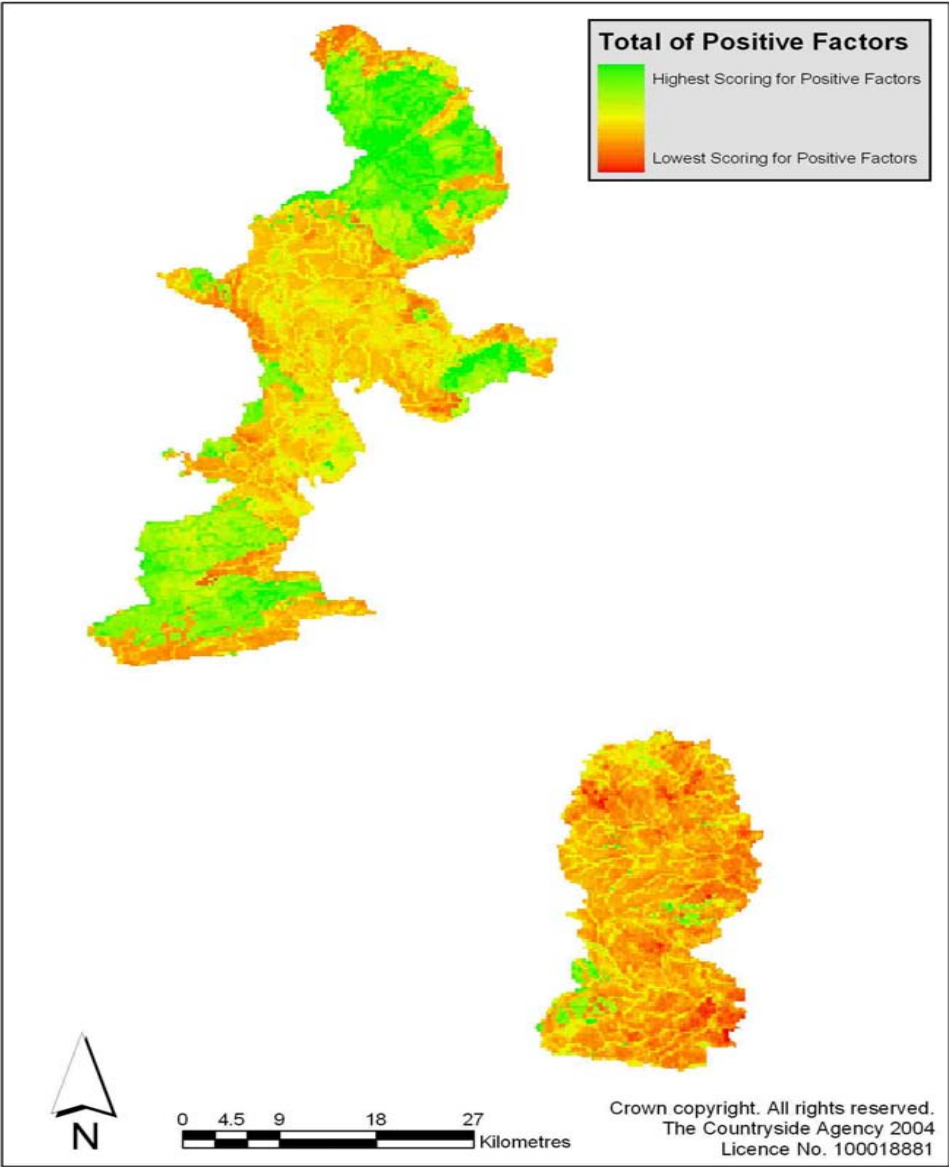


Time Weighted Noise

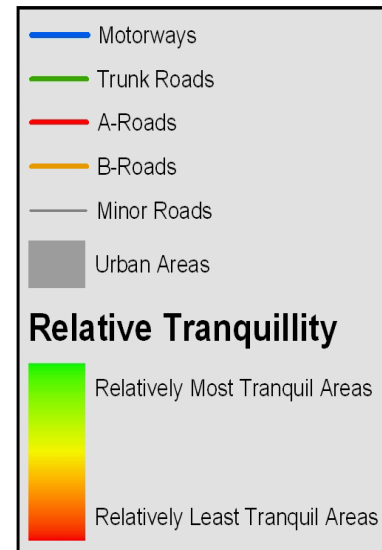
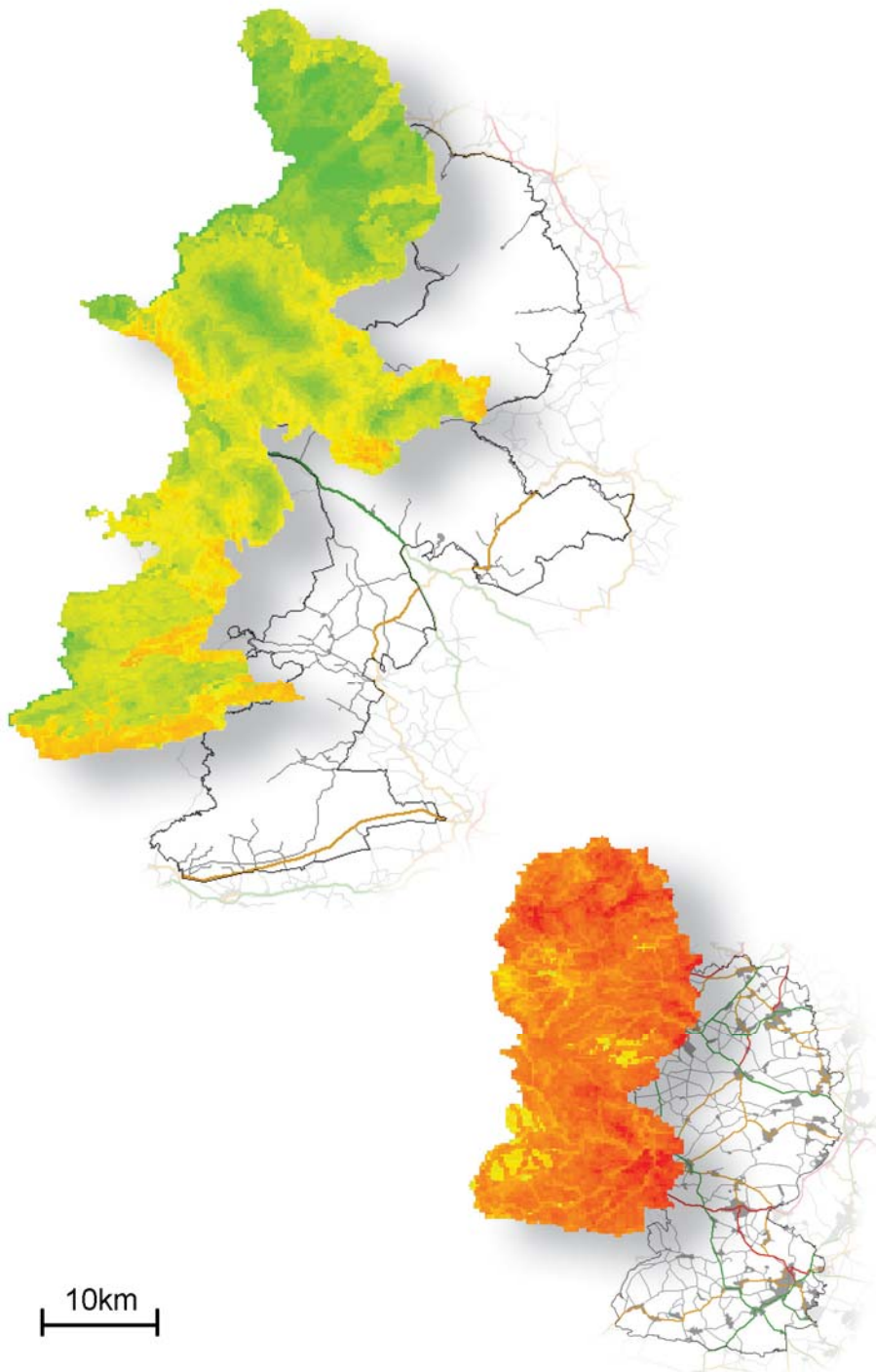


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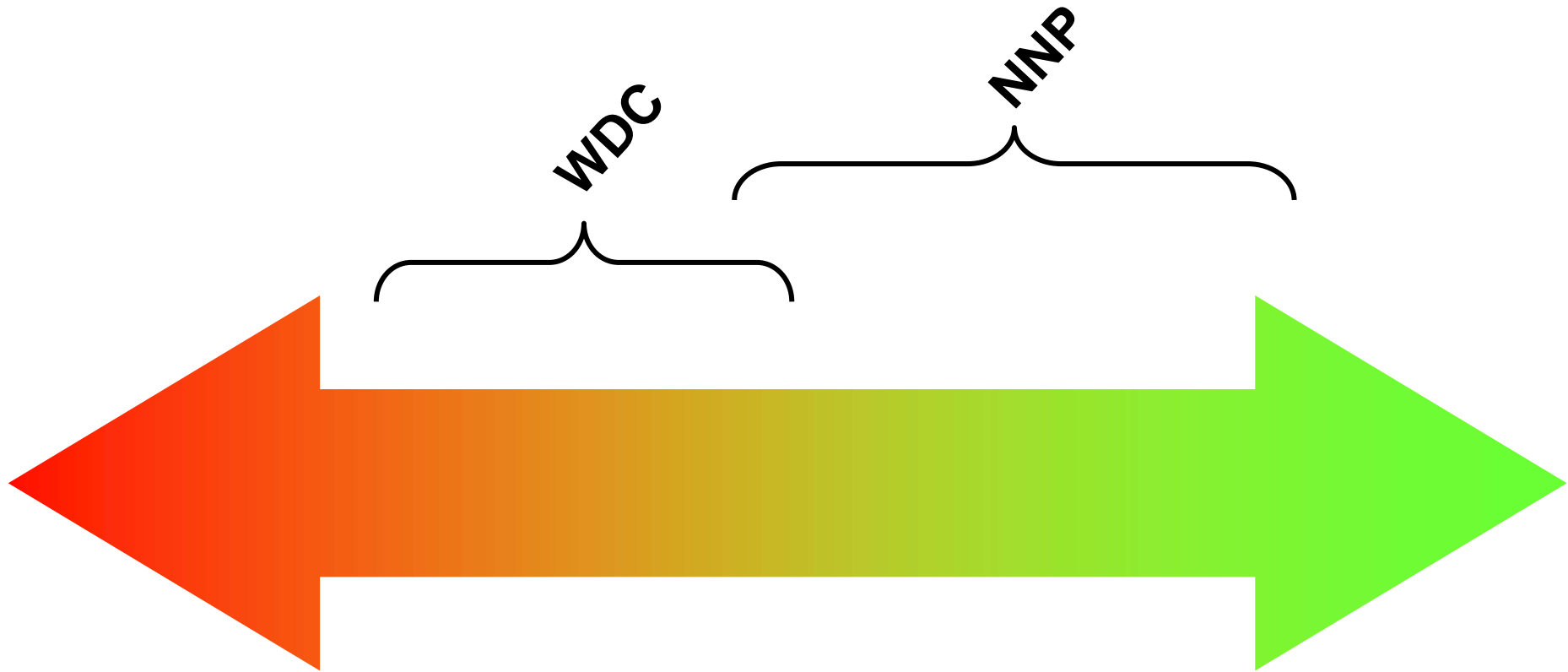




Map of Relative Tranquillity



Relative Tranquillity

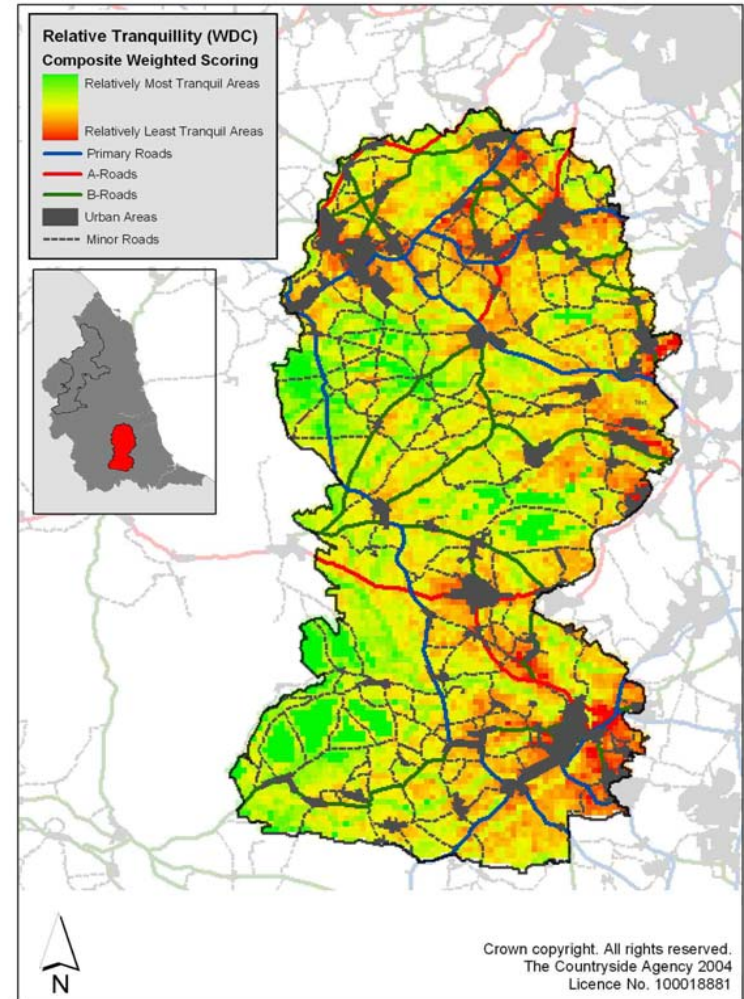
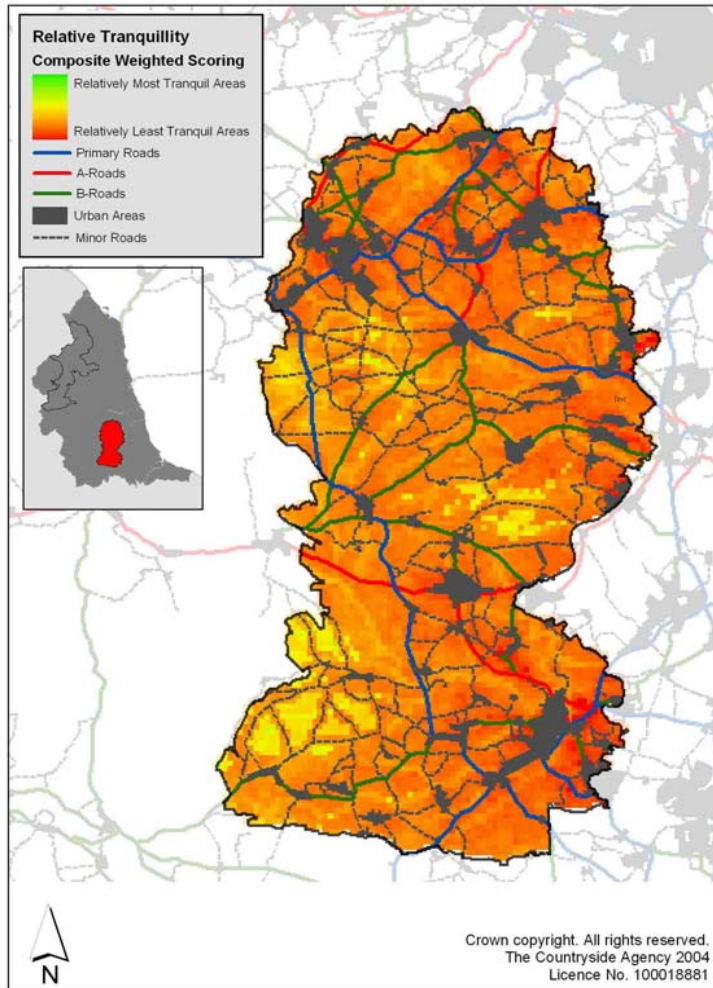


Local Significance

- **There is an important idea in here – things do not have to be nationally significant to be locally significant.**
- **While attention to the most tranquil areas is very important, area which provide a source of escape and contrast for local communities are extremely important as well.**



Relative Tranquillity for the WDC



From NE to National

- Research established that Tranquillity is important to people
- That while it a personal experience, the presence and absence of certain key factors is important
- Developed to produce a map of relative tranquillity for England



Methods

- Further research in five areas
 - Varied in landscape character
 - Varied in pressure from sources that detract from tranquillity
- Asked to chose from a list of factors from the NE work what adds to and detracts from tranquillity



Q.1. What is 'tranquillity'? What enhances 'it'? What adds to 'it'

Seeing...

- | | | |
|----------------------------|--------------------------|------------------------------------|
| 1 A natural landscape | 2 Wide open spaces | 3 A wild landscape |
| 4 Remote landscapes | 5 Trees in the landscape | 6 Deciduous trees in the landscape |
| 7 Natural looking woodland | 8 Streams | 9 Rivers |
| 10 Lakes | 11 The Sea | 12 The stars at night |

Hearing...

- | | | |
|------------------|--------------------|--------------------|
| 13 Birdsong | 14 Wildlife | 15 Natural sounds |
| 16 Silence | 17 Peace and Quiet | 18 No human sounds |
| 19 Running water | 20 Lapping water | 21 The sea |

Q.2. What is not 'tranquillity'? What detracts from 'it'? What lessens 'it'?

Seeing...

- | | | |
|------------------------------|----------------------------------|--|
| 22 Lots of people | 23 Anyone at all | 24 Overhead light pollution (night time) |
| 25 Low flying aircraft | 26 High altitude aircraft | 27 Coniferous woodland |
| 28 Power lines | 29 Wind turbines | 30 Urban development |
| 31 Any signs of human impact | 32 Railways | 33 Roads |
| 34 Towns and Cities | 35 Villages and Scattered Houses | 36 Military training (other than aircraft) |

Hearing...

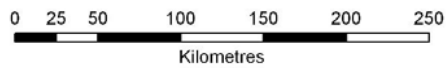
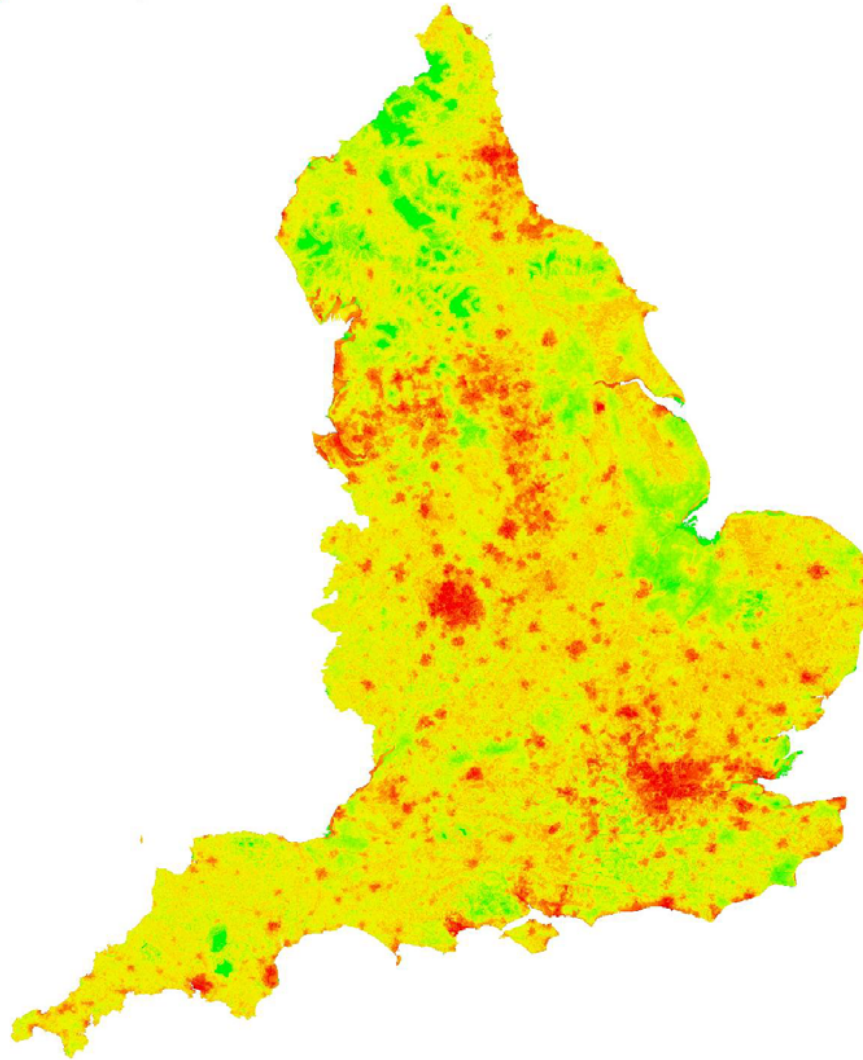
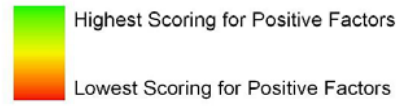
- | | | |
|-------------------------------------|--|--|
| 37 Lots of people | 38 Low flying aircraft | 39 High altitude aircraft |
| 40 Trains and railways | 41 Constant noise from cars, lorries and/or motorbikes | 42 Occasional noise from cars, lorries and/or motorbikes |
| 43 Military training (not aircraft) | 44 Non-natural sounds | |

Methods ctd

- Also asked people about distances from sources of noise or visual intrusion
- Showed photos of different landscapes, and from different distances and perspectives
- From this – established the important criteria
- And – appropriate weightings
- Used with nationally available data sets to produce a map of England

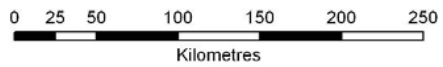
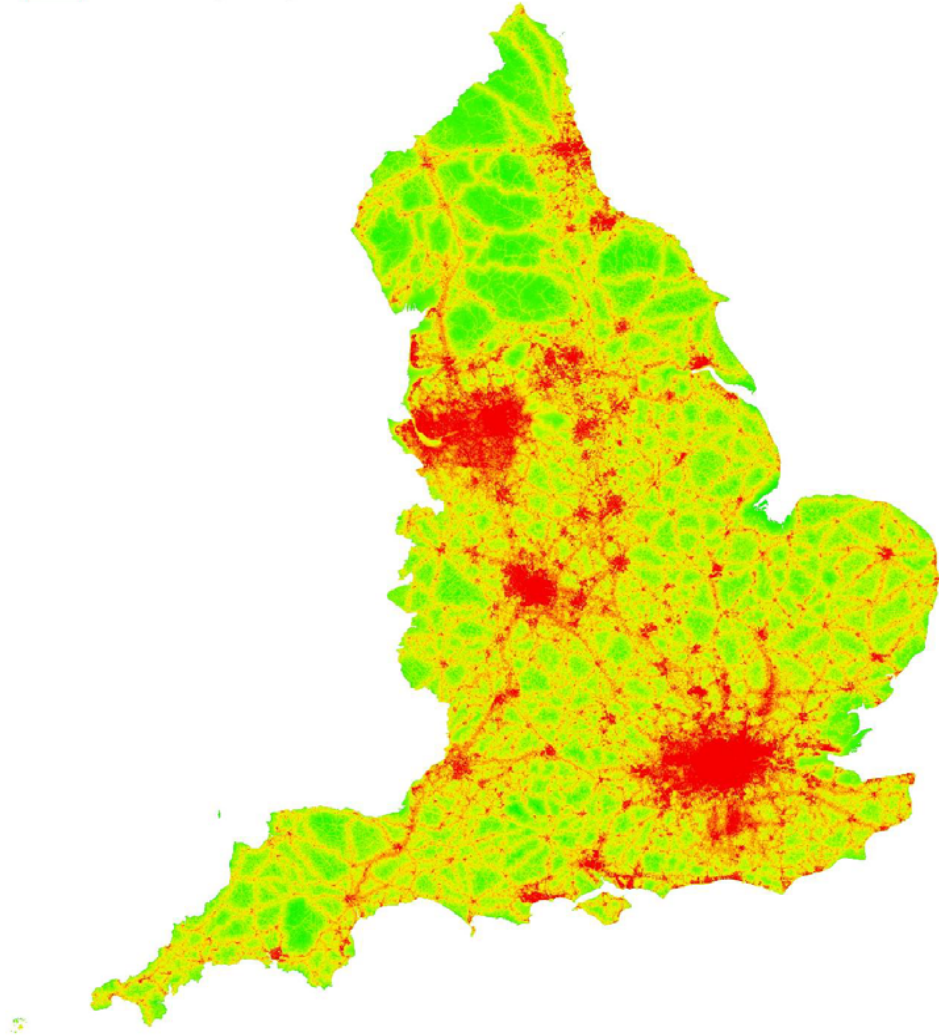
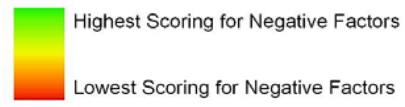


Total of Positive Factors



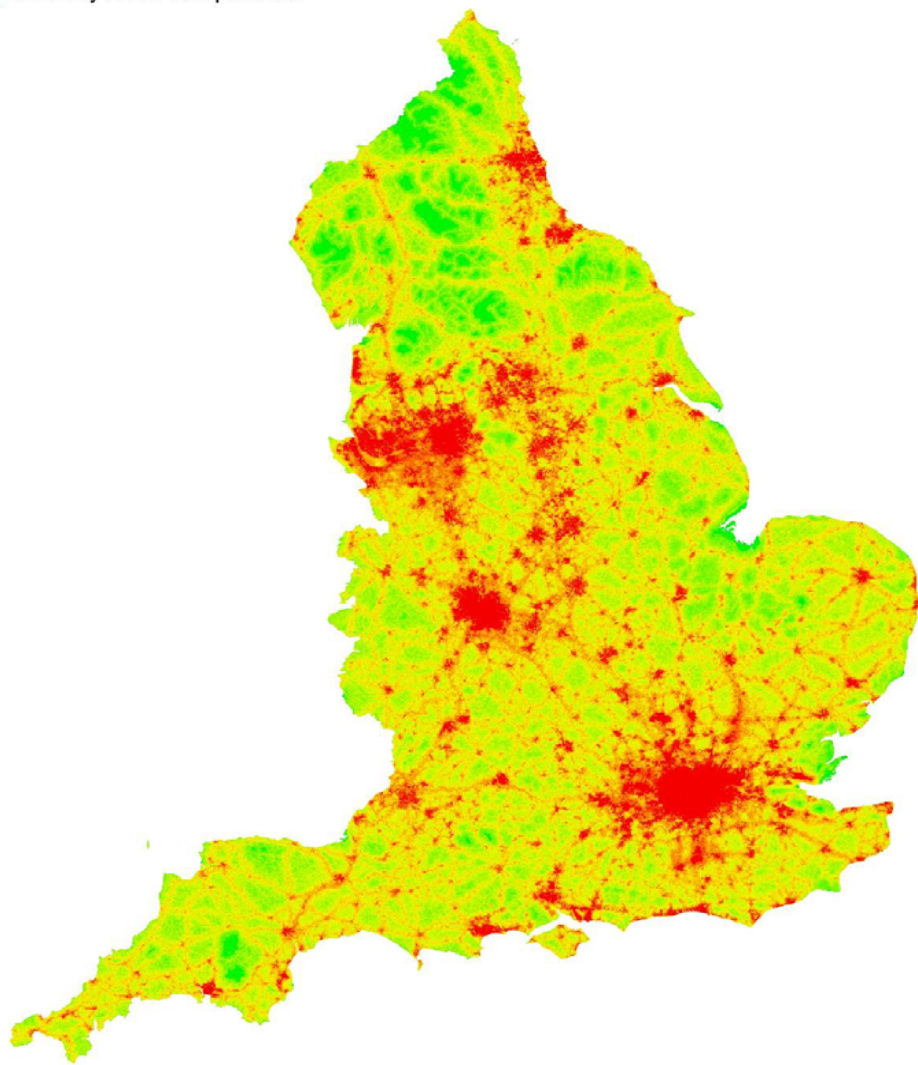
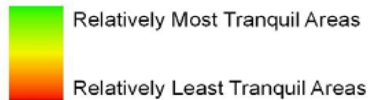
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Total of Negative Factors



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Relative Tranquillity Score



Map of *Relative* Tranquillity

Not absolute thresholds

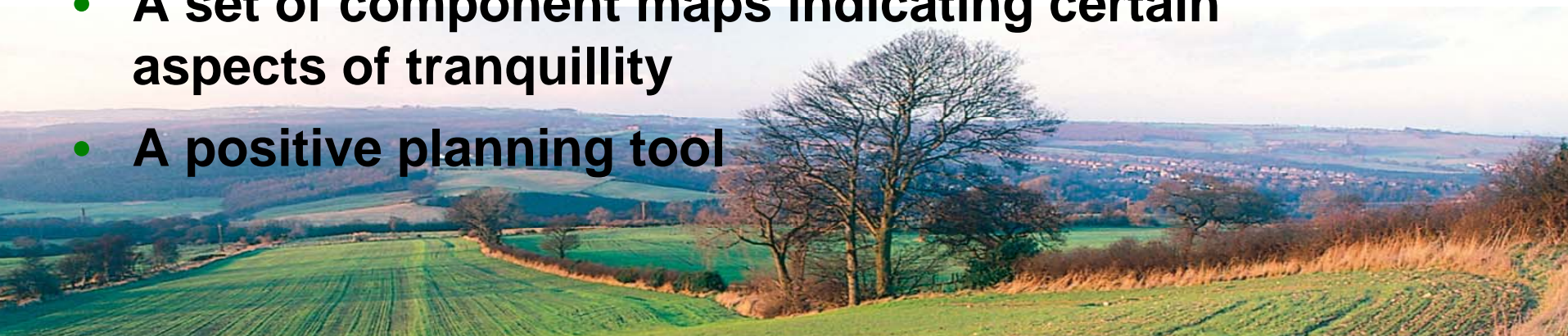


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Applications – what this can be used for

- **A map on the wall**
- **A regional image/promotional tool**
- **An indicator of where relatively un/tranquil areas are – first step to protecting or promoting them**
- **A set of component maps indicating certain aspects of tranquillity**
- **A positive planning tool**



Landscape perceived as relatively unnatural

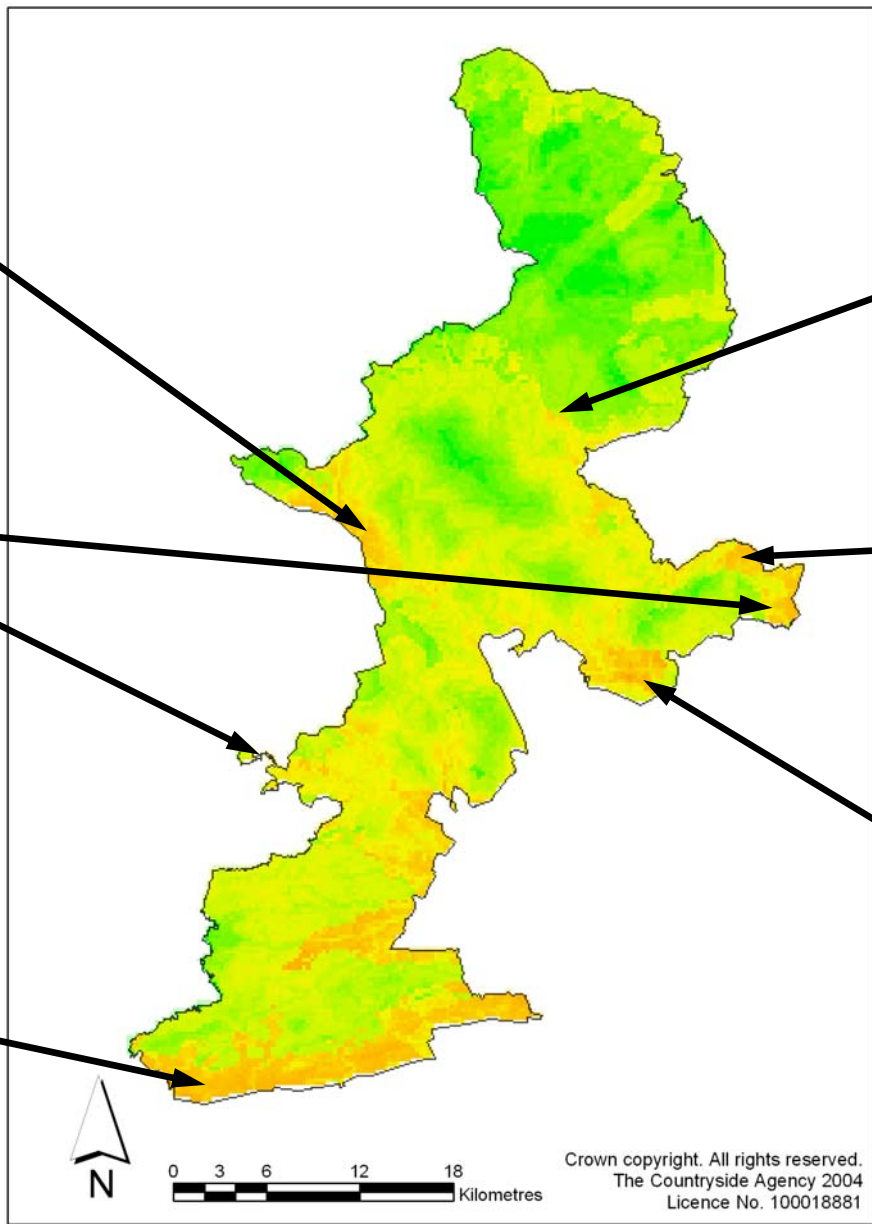
Intense, but localised visitor pressure

High visitor numbers and road noise

Low visitor numbers but periodic military noise

Signs of overt human development

Lower visitor numbers and low noise but landscape perceived as relatively unnatural



Conclusions from the Research

- **Tranquillity is important to people**
- **Tranquillity is not captured in existing indicators of countryside quality**
- **Tranquillity is subjective**
- **However, if you don't try to assess and account for tranquillity it will be 'undercounted'**
- **What was produced is not just a map – it has a range of applications, all of which should be geared towards targeting conservation where it matters most and development where it is appropriate**

Conclusions from the Research

- **Landscape is experienced subjectively**
- **It is possible to account for that experience**
- **It is important to account for that experience**
- **Such measurements can be policy-relevant**
- **Measurements are perhaps more valid if they include this subjectivity, and the values, beliefs and experiences of people**

The Research Team

The Participatory Appraisal

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PEANuT

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GIS Analysis

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Centre for Environmental and Spatial Analysis

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Project Management

Sue Jackson

Bluespace Environments

The Sponsors



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Full details of the project are available at:

www.northumbria.ac.uk/tranquillity