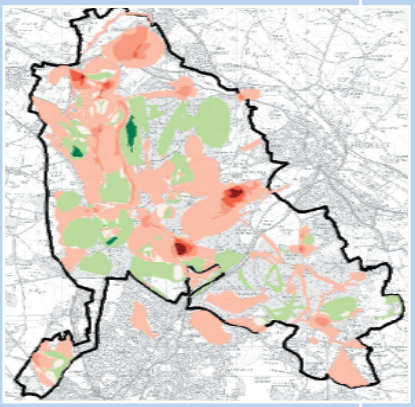
April 2007

Tranquillity Mapping in Cannock Chase AONB



Prepared for Cannock Chase AONB
by Land Use Consultants

CANNOCK CHASE
Area of Outstanding Natural Beauty

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1. INTRODUCTION

1.1. The purpose of this short study has been to suggest an approach for mapping and refining an assessment of tranquillity across the Cannock Chase AONB, building on best practice from CPRE and other sources, and to enable the subsequent monitoring of tranquillity across the AONB.

1.2. Cannock Chase AONB is a relatively small AONB located in the West Midlands. As shown in **Figure 1**, the AONB lies north of Birmingham and is located between Litchfield and Stafford, surrounded by the M6 motorway to the South and West, and the A51 to the East. Cannock Chase provides an important recreational resource for the surrounding urban areas.

1.3. The AONB Management Plan, produced in 2004, shows that extensive areas of lowland heath and coniferous woodland cut through the AONB from the north-west to the south-east, with additional areas of farmland, broadleaved woodland, and active and inactive mineral sites located throughout the area.[1] According to the Forestry Commission's National Inventory of Woodland and Trees, 28.8% of the land area within the AONB is coniferous woodland, and 11.7% is broadleaved woodland[2].

1.4. The first Vision Principle outlined in the Management Plan is to:

> *Develop the sense of Cannock Chase AONB as a special place for everyone who lives in, works within or visits the area through:*
>
> - *protecting the landscape's wilderness qualities of openness, peace, tranquillity and visual beauty for people to enjoy; and*
> - *conserving the heritage of Cannock Chase so that people can appreciate and care for it.*

1.5. Building on this principle, Action 8A of the 2006-07 AONB Action Plan is to:

> *Identify and agree broad areas and perceptions of peace and tranquillity within the AONB.*

1.6. An additional relevant theme from the current Action Plan is the need to balance the recreational purposes of the AONB with nature conservation needs. Action 24C of the Action Plan is that:

> *Recreational activities in the AONB will be reviewed to monitor their effects on the AONB.*

1.7. This report works towards the achievement of Action 8A, above. The work builds on the recent national map of tranquillity prepared for CPRE by the University of Newcastle and published in November 2006. A particular concern of Cannock Chase AONB is that the national CPRE map was developed without local

[1] Cannock Chase AONB Management Plan 2004-2009 – Figure 8: Land use within Cannock Chase AONB
[2] These percentages are likely to be a slight underestimate as this data excludes woodland tracts of less than 2 hectares.

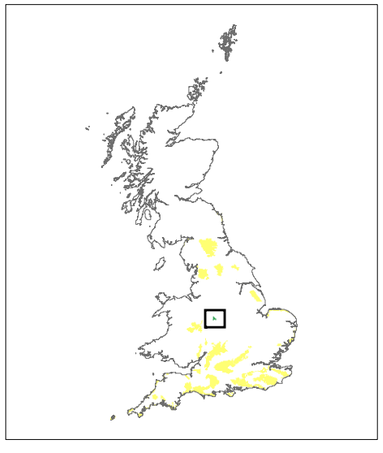
consultation. It is felt therefore not necessarily to reflect local circumstances or the important role that Cannock Chase plays in providing an area of local tranquillity within a predominantly heavily urbanised area.

Cannock Chase AONB Tranquillity Mapping

Figure 1: Cannock Chase AONB - Context

Key

Cannock Chase AONB



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2. APPROACH

2.1. The specific elements of work that have been undertaken in this short study have been:

- To fully understand the methodology that lies behind the current CPRE 2006 national map of tranquillity (based on an approach that was developed in the North East of England)
- To contact all other protected landscapes in England to understand if they have or propose to undertake more local work mapping tranquillity, and if they have or are undertaking such work, to understand the approach/methodology that they are adopting
- To map work that has recently been undertaken in Cannock Chase where local stakeholders have been asked to identify areas that they feel are most and least tranquil, based on recreational activity (using the ESRI ArcGIS 9.1 software, using geo-referenced scans of the eight paper maps provided), and to overlay the maps to build up a composite picture of perceptions of tranquillity.
- Based on all of the above information, to recommend the future approach that Cannock Chase AONB could adopt towards the mapping of tranquillity.

3. BACKGROUND

3.1. From the early 1990s increasing focus has been placed on the importance of recognising and conserving tranquillity. Tranquillity is an elusive quality that can mean different things to different people.

CPRE tranquillity mapping 1995

3.2. A major step forward came in the mid 1990s when the CPRE and the then Countryside Commission published a series of regional tranquil area maps (produced by Rendel and ASH Consulting). In these maps tranquil areas were defined as "*places that are sufficiently far away form the* ***visual or noise*** *intrusion of development or traffic to be considered unspoilt by urban influences".* These areas were determined by distances from various disturbing factors, with tranquil areas defined as those that lay:

- 4km from the largest power stations
- 3km from the most highly trafficked roads such as the M1/M6; from large towns (e.g. towns the size of Leicester and larger); and from major industrial areas
- 2km from most other motorways and major trunk roads such as the M4 and A1 and from the edge of smaller towns
- 1km from medium disturbance roads i.e. roads that are difficult to cross at peak times (taken to be roughly equivalent to greater than 10,000 vehicles per day) and some main line railways
- beyond military and civil airfield/airport noise lozenges as defined by published noise data (where available) and beyond very extensive open caste mining.

3.3. These regional tranquil areas were drawn with a minimum radius of 1km to eliminate local effects. These therefore were very clearly regional *Tranquil Areas.*

3.4. Within the *Tranquil Areas* a further set of factors were identified as creating lower levels of disturbance affecting areas 1km wide. These were:

- *linear features:* low disturbance roads; 400KV and 275KV power lines; and some well trafficked railways
- *sites:* large mining or processing operations; groups of pylons or masts; settlements greater than 2,500 in population, some half abandoned airfields and most windpower developments.

3.5. On this basis, the regional maps that were prepared identified *Tranquil Areas* (that met the first set of criteria) and *Semi-tranquil Areas* (ie those areas that fell within the influence of factors creating a lower level of disturbance). At the time of mapping, the 'early 1990s' areas of tranquillity were compared with those in the early 1960s which were mapped following exactly the same approach.

3.6. Some more local areas subsequently invested in more detailed tranquillity mapping, such as the East Hampshire AONB and the Sussex Downs AONB. These maps followed the general approach used for the regional maps but went down to a finer level of detail, mapping areas of high medium and low tranquillity, again based on distances from identified 'detractors' both noise generating and visual'.

Criticisms of the 1995 approach

3.7. These regional and more local maps of *Tranquil Areas* played a vital role in raising political awareness of tranquillity. Nevertheless, over time the approach that lay behind the maps was subject to criticism. The main thrust of this criticism was that the approach:

- did not take local perceptions into account
- only considered detractors from tranquillity, ignoring factors that contribute to tranquillity

3.8. As a consequence of these criticisms, the Countryside Agency and CPRE commissioned researchers from Northumbria University and the University of Newcastle to develop a robust methodology for tranquillity mapping. This research used two case study areas (Northumberland National Park and West Durham Coalfield) to pilot the methodology. This research is described in the next section.

3.9. A follow up study using the same techniques and undertaken by the same researchers but based in the Chilterns AONB was conducted a year later in 2005, this research is also described below.

3.10. Finally, CPRE conducted further work to develop and extend the approach developed in the initial pilot study areas. This work consisted of additional consultation and the development of a GIS model to map relative tranquillity throughout England. This work is described in the concluding part of the next section.

4. SUMMARY OF THE TRANQUILLITY MAPPING METHODOLOGY DEVELOPED BY CPRE AND THE COUNTRYSIDE AGENCY FROM 2004

Developing the methodology in the North East (2004)

4.1. The revised methodology for mapping tranquillity, piloted in the Northumberland National Park and the West Durham Coalfield, is described in the full 180 page report: *Tranquillity Mapping: Developing a Robust Methodology for Planning Support. Technical Report on Research in the Northumberland National Park and the West Durham Coalfield* (December 2004) prepared by the centre for Environmental and Spatial Analysis (CESA) Participatory Evaluation and Appraisal in Newcastle upon Tyne (PEANuT) Northumbria University and Landscape Research Group (LRG) Newcastle University.

4.2. What clearly distinguishes this methodology from the 1995 methodology is that:

- It is based on an extensive participatory approach undertaken within the two pilot areas, taking into account as many different views as possible
- These qualitative results were then 'translated' into maps, using data analysis and GIS tools
- The resulting maps produced are continuous surface maps of **relative tranquillity,** rather than identifying tranquil /non tranquil areas or areas of high / medium / low tranquillity.

The participatory appraisal

4.3. The starting point of this methodology was a Participatory Appraisal (PA) which aimed to include the views of as many different people as possible, through the use of highly visual tools. It consisted of an extensive public and stakeholder consultation, where participants were asked specific questions in order to find out which are the most important defining characters that contribute or detract from tranquillity.

4.4. The main questions explored during the PA consultation used in developing the methodology in Northumberland National Park and West Durham Coalfield were:

- What is 'tranquillity'?
- What makes an area 'tranquil'?
- What does 'tranquillity' mean to you?
- If an area were described as being 'tranquil', what features would it have?
- Where are 'tranquil' areas you know of?
- What factors cause 'tranquillity'?

- What makes an area more 'tranquil'?
- What makes an area less 'tranquil'?
- What impacts do 'tranquil' areas have?
- When you are in what you consider to be a 'tranquil' area, how do you feel?
- What does a 'tranquil' area look like?
- Do places become more/less 'tranquil' over time?(day/night, weeks, months, seasons, years…)

4.5. This consultation provided a large amount of information that was very varied and qualitative. Therefore some judgements had to be made in order to group and categorize the responses, to make the mapping possible. The following headings were chosen:

- Whether tranquillity is important;
- Why tranquillity is important;
- What state of mind and experiences tranquillity is associated with;
- What activities tranquillity is most associated with;
- What visual things contribute to tranquillity;
- What visual things damage or detract from tranquillity;
- What noises contribute to tranquillity; and
- What noises damage or detract from tranquillity.

4.6. Tranquillity could then be summarised under three different dimensions:

- People
- Landscape
- Noise

4.7. These results identified which issues were important to people. These issues were then associated with nationally available datasets such as landcover, terrain, urban areas and other human infrastructure to represent the different dimensions of tranquillity that had been identified through the participatory activities.

4.8. Once the characteristics were identified, they were weighed against their importance in defining tranquillity. The importance was evaluated through the percentage of similar responses during the consultation. The following figure provides a summary of the results obtained from the participatory appraisal.

Figure 2: Positive and negative factors' weight in defining tranquillity[3]

Positive factors	Weight
Openness of the landscape	24%
Perceived naturalness of the landscape	30%
Rivers in the landscape	21%
Areas of low noise	20%
Visibility of the sea	6%
Total of positive factors	100%
Positive Scores as a percentage of the overall scores	**44%**

Negative factors	Weight
Presence of other people	60%
Visibility of roads	12%
General signs of overt human impact	10%
Visibility of urban development	8%
Road, train and urban area noise	7%
Night time light pollution	3%
Aircraft noise	1.5%
Military training noise	<1%
Total of negative factors	100%
Negative Scores as a percentage of the overall scores	**56%**

4.9. This weighting of the different characteristics was used during the mapping process.

GIS Methodology

4.10. The mapping of tranquillity was based on 250x250 metre squares. Each of which was given three scores based on a GIS analysis for each of the three dimensions identified during the PA: People, Landscape and Noise. All calculations relating to these dimensions were carried out for each square, to assess relative tranquillity across the entire extent of each case study area.

Mapping the 'people' dimension of tranquillity

4.11. During the consultation, people and their activities were associated with many negative effects on tranquillity, such as loud noise, litter, barking dogs, noisy children, or even the very presence of people in the area. Essentially, the scores given to each square were a measure of remoteness from other people. These scores were calculated from a model which gave the likelihood of people being in a given square.

4.12. The basic assumption was that people-related nuisance declines with a reduction in the concentration of people. The results are expressed as a graded level of likelihood of seeing, hearing or being in close proximity to other people. In accordance to the PA results, people working on the land were not seen as a nuisance, and therefore were excluded from the model.

[3] Source: CPRE (2005) *Mapping Tranquillity: Defining and assessing a valuable resource.*

4.13. Each square was given a relative score using calculations that were based on the proximity of people 'sources' (e.g. urban areas) and the relative levels of resistance to the spread of people through the countryside provided by the surrounding area.

4.14. The calculations were based on the following elements of data:

1. The location of the 'source' from which the 'diffusion of people' emanates. The GIS layers used as 'sources' of people were:
   - Urban areas (polygons from the OS Strategi dataset and attributed with population and stratified into five categories from Office for National Statistics data)
   - Buildings outside of urban areas (from OS Addresspoint)
   - Roads (from OSCAR dataset)
   - Honeypot sites, comprised of:
     - Car parks (digitised from 1:25,000 base maps)
     - Caravan and Camping Sites (georeferenced from yell.co.uk search and cross-referenced against 1:25,000 base maps)
     - Picnic Sites (digitised from 1:25,000 base maps)
     - Visitor Centres (digitised from 1:25,000 base maps)
2. Layers defined as having relative levels of resistance, or friction to the spread of people through the countryside. These GIS layers were:
   - Open access areas (digitised from the hard copy 1:25,000 maps)
   - Public Rights of Way (supplied by the County Council Highways Authorities)
   - Forest Tracks (supplied by the Forestry Commission).

   Each of these layers was weighted against the level of friction to the spread of population as shown in **Table 1.**

Table 1: Relative frictional levels allocated for calculations[4]

Area	Level of Friction
Open Access Area	1
ProW	3
Forest Track	10
Remaining Area	20

4.15. The surface resulting from this process, showing the expected relative impacts of people on tranquillity, was fed into the final model and given an overall weighting of 60% of all the negative factors likely to impact on tranquillity.

[4] Source: MacFarlane, R., Haggett, C., Fuller, D., Dunsford, H. and Carlisle, B. (2004). *Tranquillity Mapping: developing a robust methodology for planning support*, Report to the Campaign to Protect Rural England, Countryside Agency, North East Assembly, Northumberland Strategic Partnership, Northumberland National Park Authority and Durham County Council, Centre for Environmental & Spatial Analysis, Northumbria University.

Mapping the 'landscape' dimension of tranquillity

4.16. Landscape was a theme that was associated with both positive and negative characteristics. It was therefore given two scores for each square, one positive and one negative.

4.17. The responses enabled the definition of several key characteristics:

- *The perceived naturalness of the landcover* (Positive and Negative). It could also be described as the visitor's immediate surroundings, which were modelled using the type of landcover in each square, and the type of landcover in the surrounding squares. The landcover was defined by the Centre for Ecology and Hydrology in the Landcover Survey 2000 dataset. This scoring was based as much as possible on the PA findings, but in order to make this data more quantifiable, the researchers used information from literature as well as their own professional judgement. The scoring was as follows:

Table 2: Scores allocated for perceived naturalness
(based on MacFarlane et al. 2004)

Name (Landcover sublass)	Score
Broad-leaved woodland (1.1)	6
Dwarf shrub heath – dense (10.1)	6
Dwarf shrub heath – open (10.2)	6
Fen, marsh and swamp (11.1)	6
Bog (12.1)	6
Standing water / canals (13.1)	6
Setaside (5.2)	5
Neutral Grass (6.1)	5
Calcareous (7.1)	5
Acid Grass (8.1)	5
Bracken (9.1)	5
Inland Rock (16.1)	5
Improved Grassland (5.1)	4
Coniferous woodland (2.1)	3
Arable – cereals (4.1)	3
Arable – horticultural (4.2)	3
Non – rotational horticulture (4.3)	3
Built up areas, suburban /rural developed (17.1)	2

Built up areas, urban residential / commercial urban industrial (17.2)	1

- *The openness of the landscape* (Positive). This is the ability to see far from one given square, with the relative visibility from all squares limited to 35Km. The positive or negative character of openness is not certain as the further that can be seen from a given square, the higher the risks of seeing features that detract from tranquillity. However, within the landscape theme, openness related solely to elevation and not to the presence or absence of built features in the landscape. On this basis, the openness of the landscape was calculated using the Digital Elevation Model (DEM) dataset.

- *Light pollution* (Negative). The skyglow modelling was based on Office of National Statistics data for urban areas, classified according to their population, and a further equation (drawn from Albers and Duriscoe, 2001) which calculated the relative contribution of skyglow from different sized settlements.

- *The presence and visibility of rivers* (Positive). The squares which contained or had a view of a river were weighted higher, and therefore more positively, than those that did not. The GIS dataset used to determine the presence of rivers was the Rivers layer from the OS Strategi dataset, while the visibility of rivers was calculated using visibility analysis techniques.

- *The ability to see the sea* (Positive). This was calculated using visibility analysis techniques as well.

- *The relative visibility of features perceived as signs of human interference* (Negative). This was calculated using visibility analysis techniques explained in the following paragraph, and related to the following features:

  - Roads: motorways and primary roads, A roads, B roads and minor roads
  - Railways
  - Urban Areas
  - Isolated Properties
  - Camping and Caravan parks
  - Vertical structures: e.g. power pylons and telecommunications masts
  - Windfarms

4.18. The visibility of features perceived as signs of human interference was assessed using key variables:

- The terrain model, which determined intervisibility between points;

- The height of the object being observed;

- The height of the person viewing (average of 1.85m);

- The distance limit beyond which visibility is no longer calculated (Zone of Theoretical Visibility), which is different for objects of different heights; and

- A distance-related scoring system, which means that a close visible object had a higher score (negative or positive depending on the object) than the same object, still visible, but further away from the observer.

Mapping the 'noise' dimension of tranquillity

4.19. As there are no existing available maps of noise, GIS techniques were used to model the diffusion of noise away from sources such as roads, urban areas, railways and military training areas. For each square time-averaged noise exposure and the maximum noise at any time were estimated. This was done to take intermittent but very loud noise and constant but low background noise into account.

4.20. The impact of noise was modelled by identifying the sources of noise that were most significant in detracting from tranquillity. These were road noise, aircraft noise, urban noise, military training and other human associated noise such as explosions or railways.

4.21. Potential maximal noise was estimated through a model that took into account the attenuation of noise resulting from geometrical divergence over distance, air absorption, ground absorption and other effects including reflection from surfaces, foliage and buildings.

Other PA findings that did not fit into the previous three dimensions

4.22. These responses dealt with the importance of the concept of tranquillity. The aim was to use this information alongside the maps to explain people's perceptions of tranquillity.

Producing the final map

4.23. Based on the three dimensions described previously, 'People', 'Landscape' and 'Noise', three datasets were produced. In order to create one final map showing the areas where an individual is most likely to experience tranquillity, these datasets were combined, through five stages.

Stage 1: The PA data were associated with a specific map-based dataset where possible.

Stage 2: Each dataset was classified as either contributing or detracting from tranquillity.

Stage 3: All of the datasets were classified and weighted to establish their relative importance, e.g. remoteness from people was far more quantitatively significant in the model than overhead light pollution. These weighted scores are shown in **Table 3**.

Stage 4: The positive and negative overall scores were calculated.

Stage 5: The positive and negative scores were combined, using a weight of 44% for the positive scores and 56% for the negative scores as found during the PA (see **Figure 2**)

Table 3: Weighting based on the PA responses for Landscape, People and Noise

Landscape and tranquillity			
Dataset	**Weighted score**	**Positive or negative**	
Light pollution	3.79	-	**Overall Weights**
Openness	25.67	+	**Negative** / **Positive**
Landcover	23.26	+	43.72 / 85.15
Overt Human Impact	10	-	
Rivers	20.89	+	
Visibility: Broadleaved Woodlands	9	+	
Visibility: Conifers	0.25	-	
Visibility: Roads	15.71	-	
Visibility: Sea	6.33	+	
Visibility: Structures	3.69	-	
Visibility: Urban	10.22	-	
Visibility: Wind Turbines	0.06	-	
People			
Dataset	**Weighted score**	**Positive or negative**	
People	80.66	-	
Noise			
Dataset	**Weighted score**	**Positive or negative**	
Low noise areas	21.65	+	**Overall Weights**
Noise: Aircraft	1.68	-	**Negative** / **Positive**
Noise: Explosions	0.05	-	10.52 / 21.65
Noise: Military	0.33	-	
Noise: Roads	6.47	-	
Noise: Trains	0.09	-	
Noise: Urban	1.9	-	

The Chilterns AONB Tranquillity study[5]

4.24. In order to assess whether the same approach in a different geographical setting and location would generate similar or different findings, the researchers who carried out the North East project undertook a comparative study of the Chilterns AONB in 2005.

4.25. The Chilterns AONB Tranquillity Study's main goal was to further explore the consultation approach, whilst documenting perceptions of tranquillity across the AONB area. This study enabled the researchers to explore the utility of the consultation approach across different areas, as well as enabling them to explore the similarities and differences in responses to what local people describe as tranquillity in different areas

4.26. A secondary aim of this project was to train local people from the AONB in participatory appraisal consultation skills, with these volunteers then acting as local

[5]Fuller, D. et al (July 2005) *Chilterns Tranquillity Study - Report on the Participatory Appraisal Consultations in the Chilterns Area of Outstanding Natural Beauty*. Report to the Countryside Agency.

facilitators. These local volunteers would also be able to provide necessary local knowledge.

4.27. For practical reasons, the participatory appraisal was carried out in two different forms:

- 'Field-based' sessions, which involved users of the Chilterns AONB at suggested outdoor locations. These participants were therefore unlikely to be aware of the project beforehand (although awareness clearly grew during the project time-span).
- 'Non-field-based' sessions, which involved participants with a 'professional' interest in the notion of tranquillity.

4.28. In total 418 people were consulted during the field-based sessions, and 38 during the non-field-based sessions.

4.29. It was important that similar, if not the same questions, were asked during the Chilterns work as had been asked during the consultations in the North East (or at least that no new, or radically different questions were introduced), to ensure that the studies were comparable. In addition to information related to the questions/responses, additional data about respondents was obtained, where possible. This included gender, age group, where participants were from and mode of transport used in accessing the site (when interviewed on-site). This information helped categorise and understand who the users of the Chilterns AONB are.

4.30. From the outset of the consultation period a reporting procedure was put in place (mirroring the approach adopted in the North East) to ensure that all responses made during the PA sessions were recorded as wholly and accurately as possible.

4.31. Verification events were held once the data had been collected to create opportunities for rectifying misunderstandings, discussing the proposed ideas and commenting on the draft report, which was circulated during the event.

Development of the National Tranquillity Map (2006)

4.32. Drawing together the work from the North East and Chilterns studies, CPRE went on to generate the national map of tranquillity through a process of further consultation and the development of a GIS model. This further work is described in CPRE's report *Saving Tranquil Places* (October, 2006) which is summarised below.

4.33. The further consultations took the form of interviews with over 1,300 countryside visitors. These interviews were conducted in four locations within each of five Districts. These districts were: Harrogate (North Yorkshire); West Lindsay (Lincolnshire); Swale (Kent); mid Devon (Devon) and Stratford upon Avon (Warwickshire). They were distributed geographically to attempt to provide a national view on tranquillity and were selected on the basis of their landscape characteristics and the presence of factors relating to tranquillity, such as air traffic, urban expansion, recreational pressure and busy roads. Rather than use the open ended questions used in the two pilots, response options were given to the four main questions:

1. What is tranquillity?
2. What adds to it?
3. What is not tranquil?
4. What lessens tranquillity?

4.34. These response options were developed from the work carried out in the pilot studies and enabled a further refinement of the weightings to be made, attempting to take into account a 'national' view.

4.35. Additional research at this stage also involved the development of visual thresholds relating to tranquillity, to compliment existing research on noise thresholds: "*researchers questioned people using photographs of man-made structures at various distances in the landscape and gained an understanding of these visual thresholds"* (CPRE, 2006). These visual thresholds therefore relate to "*how much intrusion of man-made structures into largely natural landscapes people can tolerate before it significantly reduces their experience of tranquillity"* (CPRE, 2006).

4.36. Drawing on the survey work and the additional research into thresholds, 44 factors were developed which had either a positive or a negative impact on tranquillity. Each of these factors was given a weighting, reflecting the perceived importance of that factor as quantified from the consultation work. The impact of these factors on the ground was then calculated using geographic data sets within a GIS, providing outputs on a 500m sq. grid basis throughout England. Finally scores were provided for each 500x500m square, by applying the weightings to each of the factors in the geographical output.

4.37. The overall scores provided an indication of "*how likely the environment in that square was likely to make people feel tranquil"* (CPRE, 2006). It is worth noting that two different squares assessed using this methodology could have the same output score

for entirely different reasons. Clearly this is a very much more sophisticated approach to that adopted in 1995.

5. SUMMARY OF RECENT WORK UNDERTAKEN ON TRANQUILLITY WITHIN OTHER PROTECTED LANDSCAPES

5.1. As part of this short piece of work, the majority of the protected landscapes in England have been contacted by telephone to understand if they have or may carry out work on tranquillity mapping. This was preceded by a brief review of the relevant Management Plans to identify whether mapping of tranquillity had been identified as a specific action (see **Table 3** below).

5.2. Of the protected landscapes contacted (in addition to Northumberland National Park and the Chilterns AONB) five may undertake tranquillity mapping work in the future, while five are currently undertaking, or have recently undertaken, specific work in this area. These latter five are briefly described below.

The Yorkshire Dales National Park

5.3. The Yorkshire Dales National Park Authority is currently continuing to adopt CPRE's 1995 methodology, so that change can be clearly identified over time. As already described, this approach is desk based and involves identifying features that detract from tranquillity and mapping areas of influence around these to identify remaining tranquil areas. Changing the methodology at this stage would involve time and money which they do not have.

Kent Downs AONB

5.4. Following publication of the 'new' CPRE tranquillity map, the AONB Unit circulated a tranquillity questionnaire in the local paper (see **Appendix 1**). This short questionnaire covers the meaning of tranquillity, how it makes people feel, how important it is to people, where people feel it is tranquil, and the activities undertaken in tranquil areas. People were also asked to score detractors from tranquillity on a grade of 1 – 3.

5.5. The questions asked therefore were very similar to those in the national CPRE methodology but elicited a local response. These questionnaire responses are currently being analysed but, because of current staffing, it remains uncertain how and if they will be mapped and what data if any will be used in this mapping exercise.

Shropshire Hills AONB

5.6. In late 2006, but before the CPRE national map was released, the Shropshire Hills AONB, started a piece of work with three elements that sought to respond to the largely desk-based nature of the 1995 tranquillity methodology. Consultants were commissioned to monitor actual noise levels at 15 selected locations across the AONB, aiming to give a geographical spread, and a representative range from noisy (by main roads) to remote locations. Some locations were deliberately chosen to be popular sites with visitors. These choices were seen as consistent with the limited scale of the project, which aims to illustrate the issue rather than attempt to map

noise comprehensively. The focus is clearly on noise as this is seen to be the main issue.

Table 3: Contact with protected landscapes

Designated areas	Management Plan Review		Telephone Interviews				
	Management plan reviewed	Action to map tranquility	Designated areas contacted	Recent work on mapping tranquillity undertaken	Ambition to undertake work on mapping tranquillity	Rely on CPRE's work	Plan to use CPRE's work
Areas of Outstanding Natural Beauty							
Arnside and Silverdale	✓		✓				
Blackdown Hills	✓		✓				
Cannock Chase							
Chichester Harbour	✓		✓		Maybe		
Chilterns**				✓			
Cornwall			✓		Maybe		
Cotswolds	✓		✓			✓	
Isles of Scilly			✓				
Cranborne Chase and West Wiltshire Downs	✓	✓	✓	✓	Maybe		
Dedham Vale	✓		✓				
Dorset	✓		✓	✓			
East Devon	✓	✓	✓				
East Hampshire			✓				
Forest of Bowland	✓		✓				
High Weald	✓		✓				
Howardian Hills	✓		✓				
Isle of Wight	✓		✓			✓	
Kent Downs	✓	✓	✓	✓			Maybe
Lincolnshire Wolds			✓				
Malvern Hills	✓		✓			✓	
Mendip Hills	✓		✓				
Nidderdale	✓		✓			✓	
Norfolk Coast	✓		✓				
North Devon	✓		✓				
North Pennines	✓						
North Wessex Downs	✓	✓	✓			✓	
Northumberland Coast	✓		✓			✓	
Quantock Hills	✓		✓				
Shropshire Hills	✓	✓	✓	✓			✓
Solway Coast	✓						
South Devon	✓		✓			✓	
Suffolk Coast & Heaths			✓				
Surrey Hills	✓		✓				
Sussex Downs			✓				
Tamar Valley	✓		✓				
Wye Valley	✓		✓		Maybe		✓
National Parks							
Dartmoor	✓						
Exmoor	✓						
Lake District	✓		✓				
New Forest							
North York Moors			✓			✓	
Northumberland**	✓	✓		✓			
Peak District	✓						

Designated areas	Management Plan Review		Telephone Interviews				
	Management plan reviewed	Action to map tranquility	Designated areas contacted	Recent work on mapping tranquillity undertaken	Ambition to undertake work on mapping tranquillity	Rely on CPRE's work	Plan to use CPRE's work
The Broads			✓		Maybe	✓	
Yorkshire Dales	✓		✓	✓			

** The Chilterns AONB and the Northumberland National Park were not contacted as the methodology they followed was described in the CPRE work found during the literature review phase.

5.7. This emphasis on noise generation reflects that Defra are currently undertaking a noise mapping project based on the measurement of ambient noise levels, although so far this has only been taken forward in London.

5.8. The other two elements of this study in the Shropshire Hills, which have yet to be taken forward, are:

- a desk exercise looking specifically at road traffic based on traffic flow data from the Highways Authority; and
- a perception of tranquillity questionnaire with Parish Councils.

Dorset AONB

5.9. Although Dorset AONB indicated that some work in assessing tranquillity has taken place, it has not been possible to establish what work has been carried out, and we are therefore unable to provide a description of this work within this report.

Cranborne Chase and West Wiltshire Downs AONB

5.10. In 2003 LUC carried out an Integrated Landscape Character Assessment on behalf of the AONB. This work did not set out to map tranquillity, but where remoteness and tranquillity were felt to be part of the key characteristics of the landscape character this was noted within the report. A sense of remoteness and tranquillity was also suggested as one of the AONB-wide indicators for monitoring change.

Other approaches

5.11. Eight of those protected landscapes contacted aim to use the current CPRE map without making any further amendments (**Table 3**) believing this to be adequate for their needs. For example, in the case of the Cotswolds it is recognised that it would be very difficult and costly to undertake any more local work, given that the Cotswolds cover various 'local areas'. A further five protected landscapes may undertake some form of local tranquillity work in the future, potentially building on the CPRE national map. In the case of the Lake District any work on tranquillity would not be for at least three years, although it is possible that the Friends of the Lake District might undertake some tranquillity work sooner. In the case of Cranborne Chase and West Wiltshire Downs AONB the primary aim will be to compare the landscape character descriptions contained in the Landscape Character Assessment of the AONB (which identifies tranquillity as a key characteristic of the AONB) with the CPRE national map.

6. DEVELOPING AN APPROACH TO TRANQUILLITY MAPPING FOR CANNOCK CHASE AONB

WORK UNDERTAKEN TO DATE

6.1. Following the release of the CPRE National Tranquillity maps in October 2006, Cannock Chase undertook some consultation work with key stakeholders and local interest groups to create maps of the AONB showing areas with greater or lesser recreational impact.

6.2. One of the drivers for this work is the fact that Natural England has set tranquillity as a key performance indicator for all AONBs nationwide. Additional drivers are the actions set out in the introduction to this report from the Cannock Chase AONB Action Plan 2006-07.

6.3. The release of the national CPRE map, although welcomed as a national indicator of relative tranquillity, was not felt to fulfil the task needed to establish a local baseline for tranquillity and enable the future monitoring of this baseline. One of the concerns of the AONB team was that reasons for local tranquillity (or lack of) are likely to vary geographically and whilst some factors, such as the openness of the landscape, are of particular importance in some areas, in others areas different factors will have a much greater importance in contributing to or detracting from tranquillity.

6.4. In essence, what might be needed is a version of the CPRE map with a set of 'local weightings', developed through consultation, to establish what tranquillity is within Cannock Chase, and what it means to the users of the AONB.

6.5. The maps drawn up in consultation are shown in **Figure 3**. These are a selection from a number of maps created in a series of meetings from October 2006 to January 2007. The consultees for the initial maps were those considered to have specialist knowledge, such as ecologists and landscape architects within the County Council, rangers and staff from the Forestry Commission and tourism specialists. Subsequent meetings included a broader range of stakeholders, including representatives from local Parish Councils, local residents, farmers, Staffordshire Wildlife Trust and West Midland Bird Club.

6.6. The maps were drawn up during meetings which covered landscape and recreational issues, including 'Managing the Landscape' topic groups, and a Visitor Centres meeting. These meetings all took place within the AONB boundary.

6.7. The contributors were asked to map those areas of the AONB which were busiest, in their opinion, with grades of 'busy-ness' or levels of recreational impact, being denoted by different colours of crayons. One of the assumptions behind this approach was that the most tranquil areas would be left on the map as those without any colouring, the benefit of this approach being that attention would not be drawn explicitly to the most tranquil areas.

6.8. A number of points were raised during the mapping exercises, some of which are noted below, drawn from the minutes of the Managing the Landscape Topic Group meeting on 04/12/06.

6.9. Some interesting points raised through this process relate to the difficulty of defining and establish tranquillity, e.g.

- *Biggest problem is no tranquil areas on open heathland – point contested!*
- *Some people feel more safe (therefore more tranquil) on heathland as they can see around them. Whereas others feel safer (therefore more tranquil) in woodlands as they feel protected by the trees.*
- *How do you define tranquil? Main roads go through tranquil areas where there's not many people. Is it people or noise?*

6.10. Other points related to the differing levels of tranquillity at different times of the day, week or year, e.g.

- *Sherbrook is perceived as busy, but depends on time of day/week/year and part of Sherbrook being visited.*
- *Events can make a difference for example to the number of Land Rovers on Cannock Chase AONB.*
- *Varies greatly at weekends. Winter weekends attract more visitors.*
- *"rush hours" for people such as dog walkers.*

6.11. Finally, one of the points suggested that '*Perhaps we should map areas we'd like to be tranquil*'.

6.12. Eight of the maps drawn up through this process were scanned, georeferenced and digitised as part of this work, and the result of this can be seen in **Figure 4**. The final map in the series shown in this figure is an amalgamation of all eight maps, and this map aims to provide a gradation of levels of recreation impact, based on all the contributory maps.

6.13. To produce this composite map, each contributory map, once digitised, was provided with a score for the areas outlined, as defined in **Table 4**:

Table 4: Scoring system for composite map

Level of recreational impact	Colour on original maps	Score
High	Red	-10
Medium	Orange	-5
Low	Green	+10

6.14. This basic scoring system aims to highlight areas that have been identified by a number of groups as having a high level of recreational impact (and are less tranquil

as a result), and to also highlight those areas that have low levels of recreational impact and are likely to be more tranquil. Those areas noted on only 1 or 2 maps will have scores closer to zero, and as a result will be less bold on the composite map.

6.15. The resulting composite map, together with the output scores, is shown in **Figure 5**, this map also shows where there are levels of agreement between the contributory maps, and where there are disagreements. It is evident from the map that there are considerable areas of disagreement, and it is likely that the maps would need to be re-explored with the consultees to establish clearly the reasons for these differences.

6.16. Finally, the amalgamated map drawn up on the basis of the consultation sessions has been compared with the CPRE map of tranquillity, as shown in **Figure 6**. A full understanding of the factors contributing to and detracting from the CPRE map would be gained through an analysis of the scores for each area of the map. Unfortunately, CPRE have been unable to release this data within the timescales required for this work, so a comprehensive analysis of these factors has not been possible.

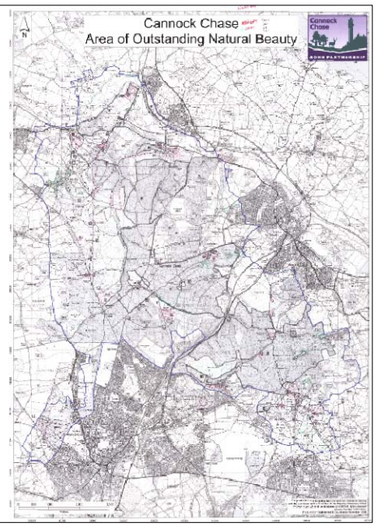
6.17. Notwithstanding the lack of data, and based on a visual analysis, there are some areas of similarity between the two maps, with areas of lesser recreational disturbance, or greater tranquillity, being shown around Haywood Warren and Strawberry Hill, for example. However, there are distinctly local effects shown in the consultation maps around visitor centres and 'honeypot sites' such as Brindley Valley and Lady Hill which do not show up on the CPRE map. It is likely that this local relative lack of tranquillity is not distinct in the CPRE map as these areas would have scored highly for their perceived naturalness. Another distinct difference between the maps can be found in the area around the A460. On the consultation derived maps, this area is shown implicitly as having greater tranquillity, due to the lack of perceived recreational impact around the road; the CPRE map however shows this area as one of the least tranquil parts of the AONB, due to the combined effect of the road and its associated noise and the 'lack of friction' to visitors from the neighbouring urban areas of Rugeley and Cannock.

6.18. In summary, a number of differences between the two maps are apparent. Distinctly local effects on tranquillity (both positive and negative) picked up through the consultation process were not evident on the CPRE map. This was partly due to the differing scales of study, and partly due to the fact that the two maps are not comparing 'like with like'. In essence, the consultation maps were mapping one aspect of the CPRE maps – the negative effect of other people on the perceived tranquillity of the landscape.

Cannock Chase AONB Tranquillity Mapping

Figure 3: Original maps drawn up in consultation

Map 1

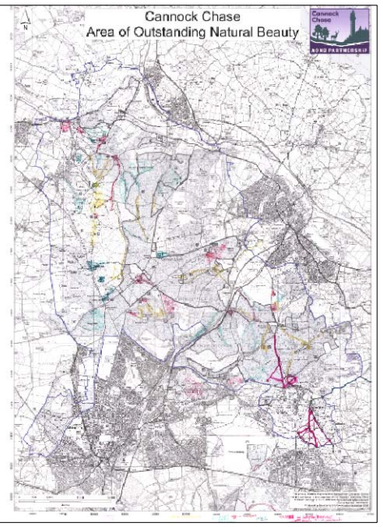


December 2006

Managing the Landscape Topic Group

Representatives from West Midland Bird Club, Natural England, Partnership Chairman (district councillor), local farmer

Map 2



December 2006

Managing the Landscape Topic Group

Representatives from Friends of Cannock Chase, Staffordshire Parish Councils Association (and our Advisory Partnership and district council), Litchfield District Council ecologist.

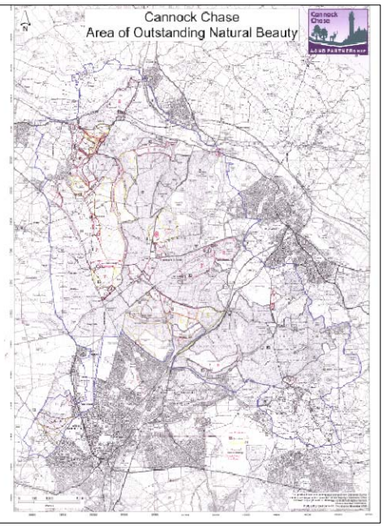
Map 3

January 2007

Visitor Centre Group

Representatives from Forestry Commission rangers and Cannock Chase Council Tourism

Map 4

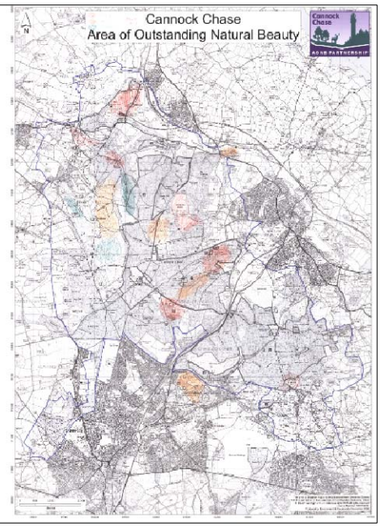


October 2006

Managing the Landscape Topic Group

Representatives from Staffordshire County Council - Ecology

Map 5

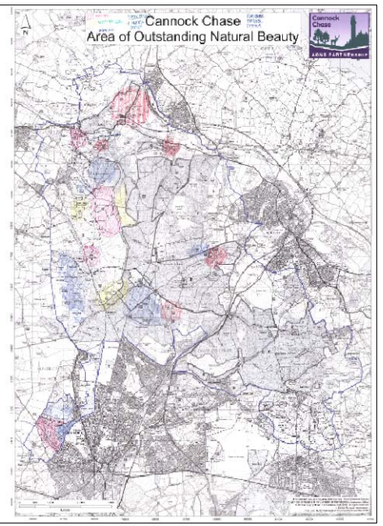


January 2007

Visitor Centre Group

Representatives from Staffordshire Wildlife Trust, Woseley Centre (HQ & visitor centre), Museum of Cannock Chase.

Map 6

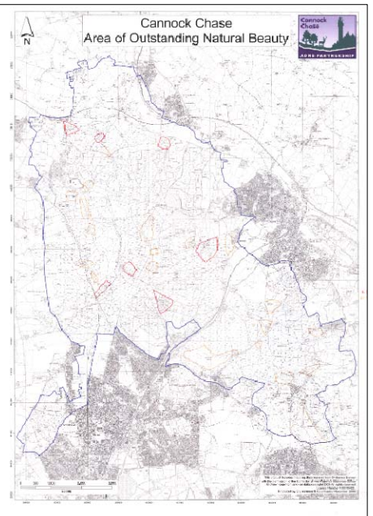


December 2006

Managing the Landscape Topic Group

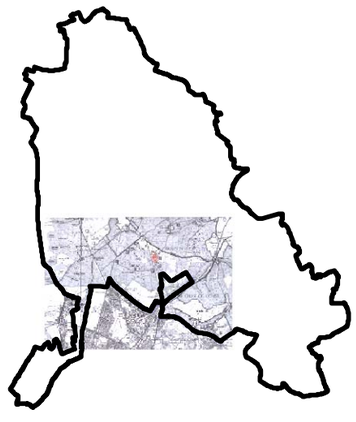
Representatives from local Parish Council, South Staffordshire Council (planning), Staffordshire County Council tourism

Map 7



Completed seperately by a Parish Council Chairman/ West Midland Bird Club representative.

Map 8



Date unknown

Visitor Centre Group

Tourism professional

N
W E
S

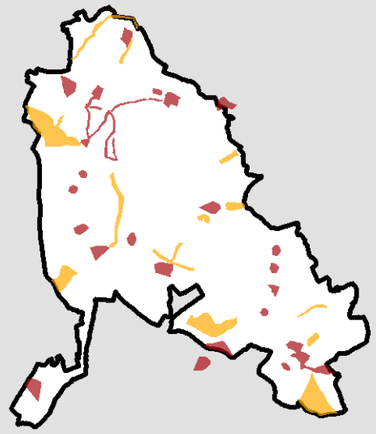
0 1.25 2.5 5 Km

Source: Consultation work carried out by Cannock Chase AONB

Date: 19/03/2007
Revision:

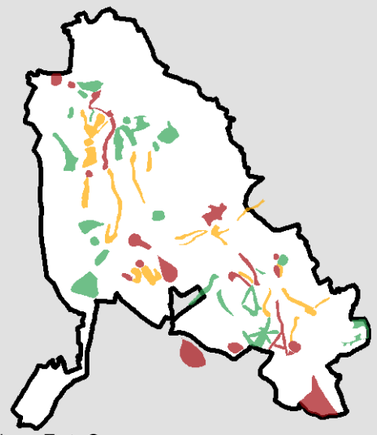
File: S:\4000\4075 Cannock Chase AONB Tranquillity\GIS\Themes\ArcGIS9\4075-01_003_tranquillity_smallmultiple.mxd

Map 1



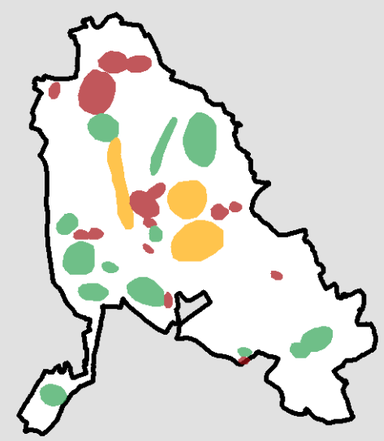
December 2006
Managing the Landscape Topic Group
Representatives from West Midland Bird Club, Natural England, Partnership Chairman (district councillor), local farmer

Map 2



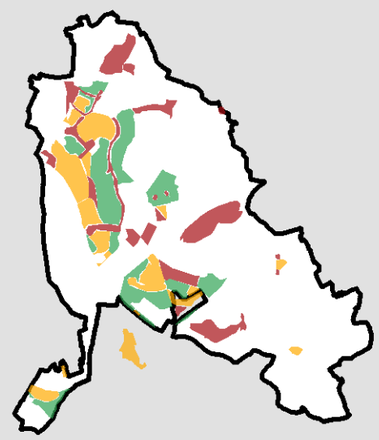
December 2006
Managing the Landscape Topic Group
Representatives from Friends of Cannock Chase, Staffordshire Parish Councils Association (and our Advisory Partnership and district council), Litchfield District Council ecologist.

Map 3



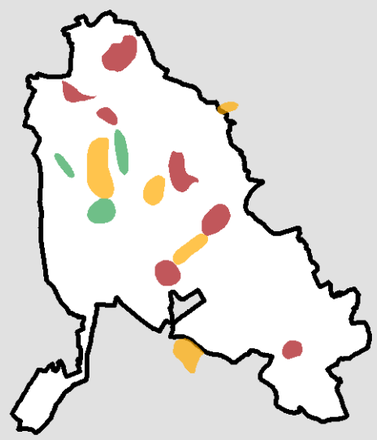
January 2007
Visitor Centre Group
Representatives from Forestry Commission rangers and Cannock Chase Council Tourism

Map 4



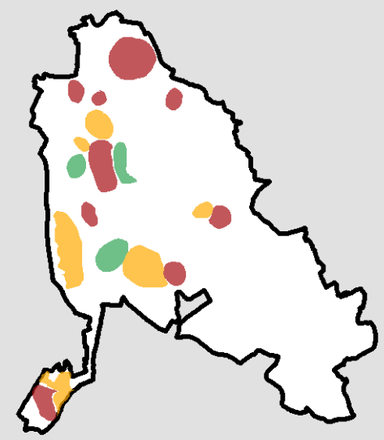
October 2006
Managing the Landscape Topic Group
Representatives from Staffordshire County Council - Ecology

Map 5



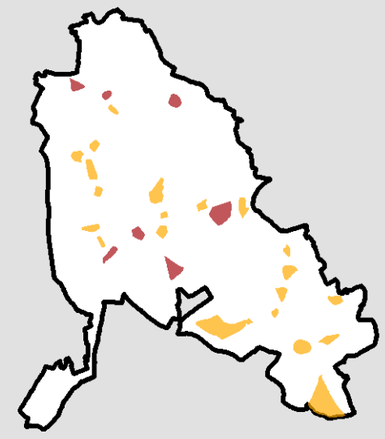
January 2007
Visitor Centre Group
Representatives from Staffordshire Wildlife Trust, Woseley Centre (HQ & visitor centre), Museum of Cannock Chase.

Map 6



December 2006
Managing the Landscape Topic Group
Representatives from local Parish Council, South Staffordshire Council (planning), Staffordshire County Council tourism

Map 7

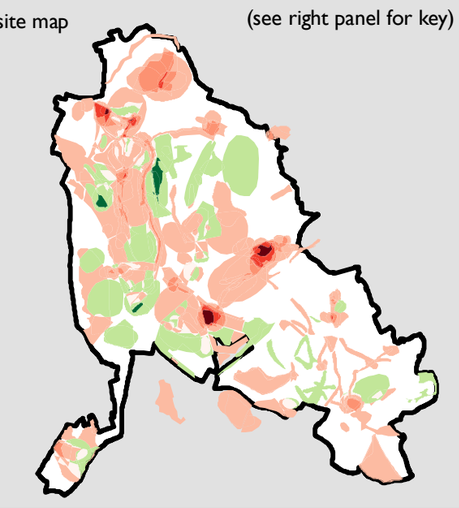


Completed seperately by a Parish Council
Chairman/ West Midland Bird Club representative.

Map 8

Date unknown
Visitor Centre Group
Tourism professional

Composite map (see right panel for key)



Cannock Chase AONB Tranquillity Mapping

Figure 4: Digitised tranquillity maps based on consultation work

Cannock Chase AONB

Key for maps 1 to 8

- Highest recreational impact
- Medium recreational impact
- Low recreational impact

Composite map key

- Highest combined recreational impact
- Lowest combined recreational impact

N
W E
S

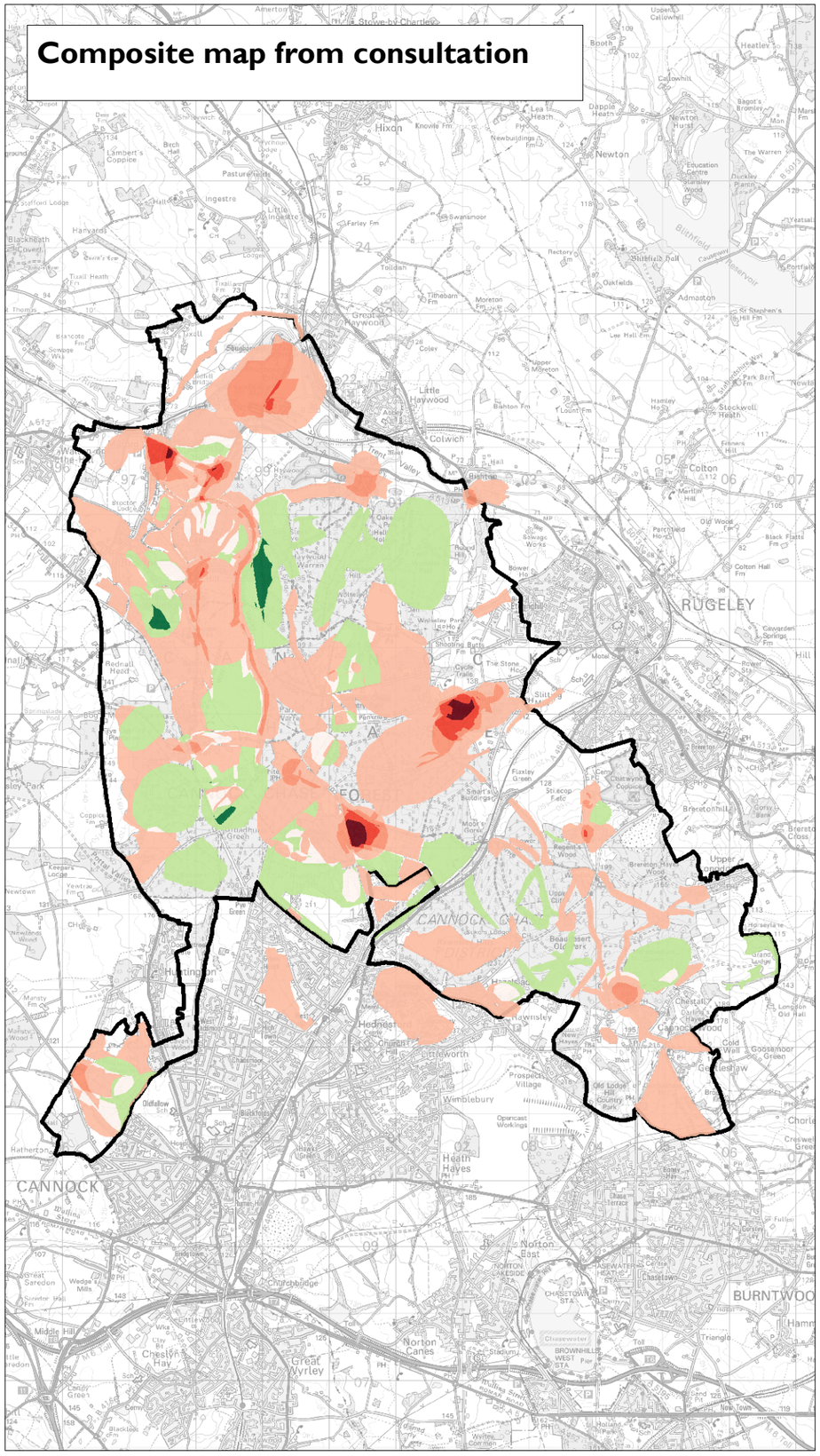
0 1.25 2.5 5 Km

Source: Consultation work carried out by Cannock Chase AONB

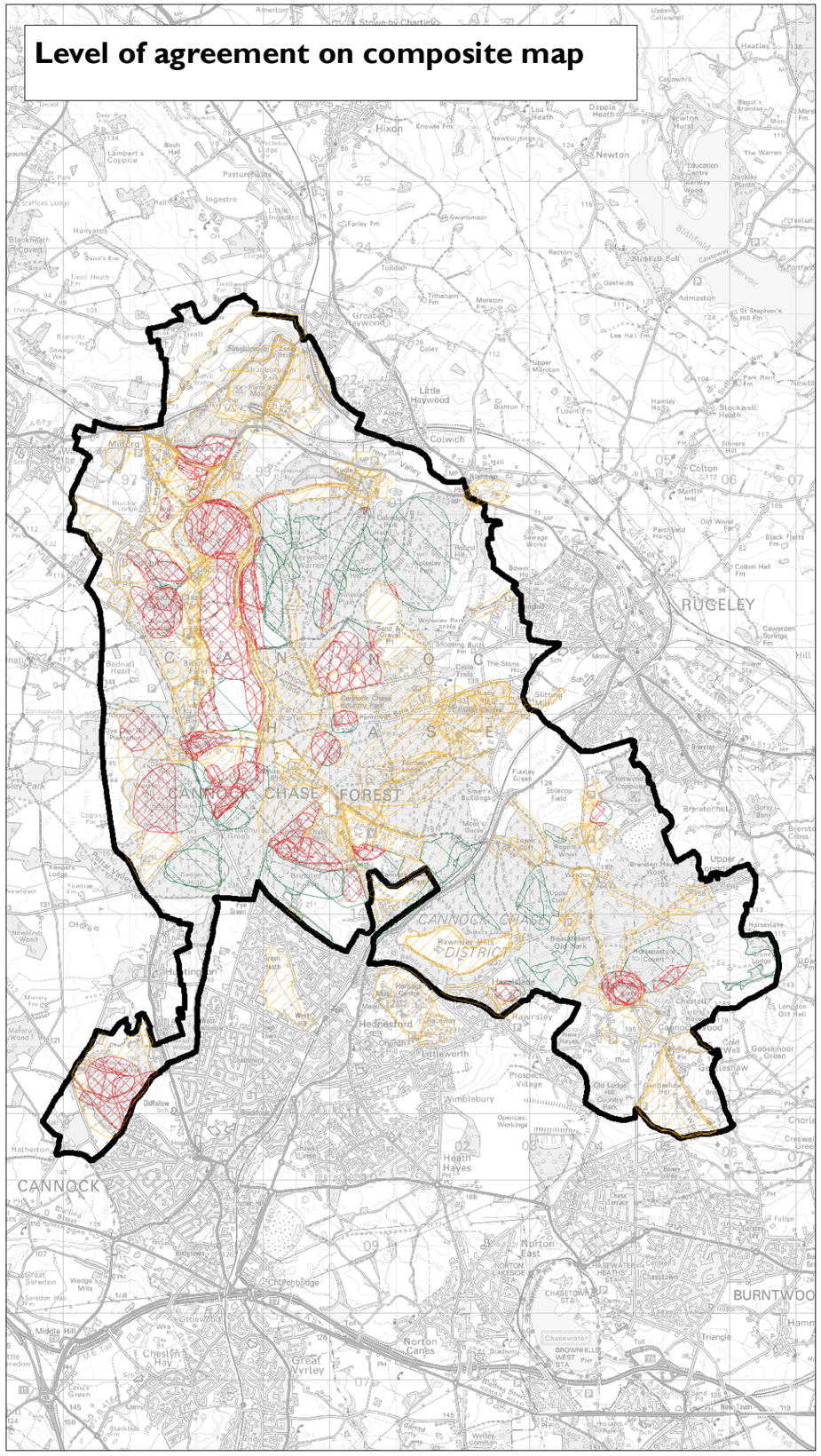
Date: 19/03/2007
Revision:

File: S:\4000\4075 Cannock Chase AONB Tranquillity\GIS\Themes\ArcGIS9\4075-01_003_tranquillity_smallmultiple.mxd

Composite map from consultation



Level of agreement on composite map



Cannock Chase AONB Tranquillity Mapping

Figure 5: Composite mapping scores and levels of agreement

Key

Composite score

- Highest combined recreational impact (-70)
- -45 to -60
- -25 to -40
- -5 to -20
- 0
- 5 to 20
- Lowest combined recreational impact (25 to 40)

Level of agreement

- Area of agreement (positive score)
- Area of agreement (negative score)
- Area of conflict
- Cannock Chase AONB

N W E S

0 0.3 0.6 1.2 Km

Source: Consultation work carried out by Cannock Chase AONB.

Date: 26/03/2007
Revision:

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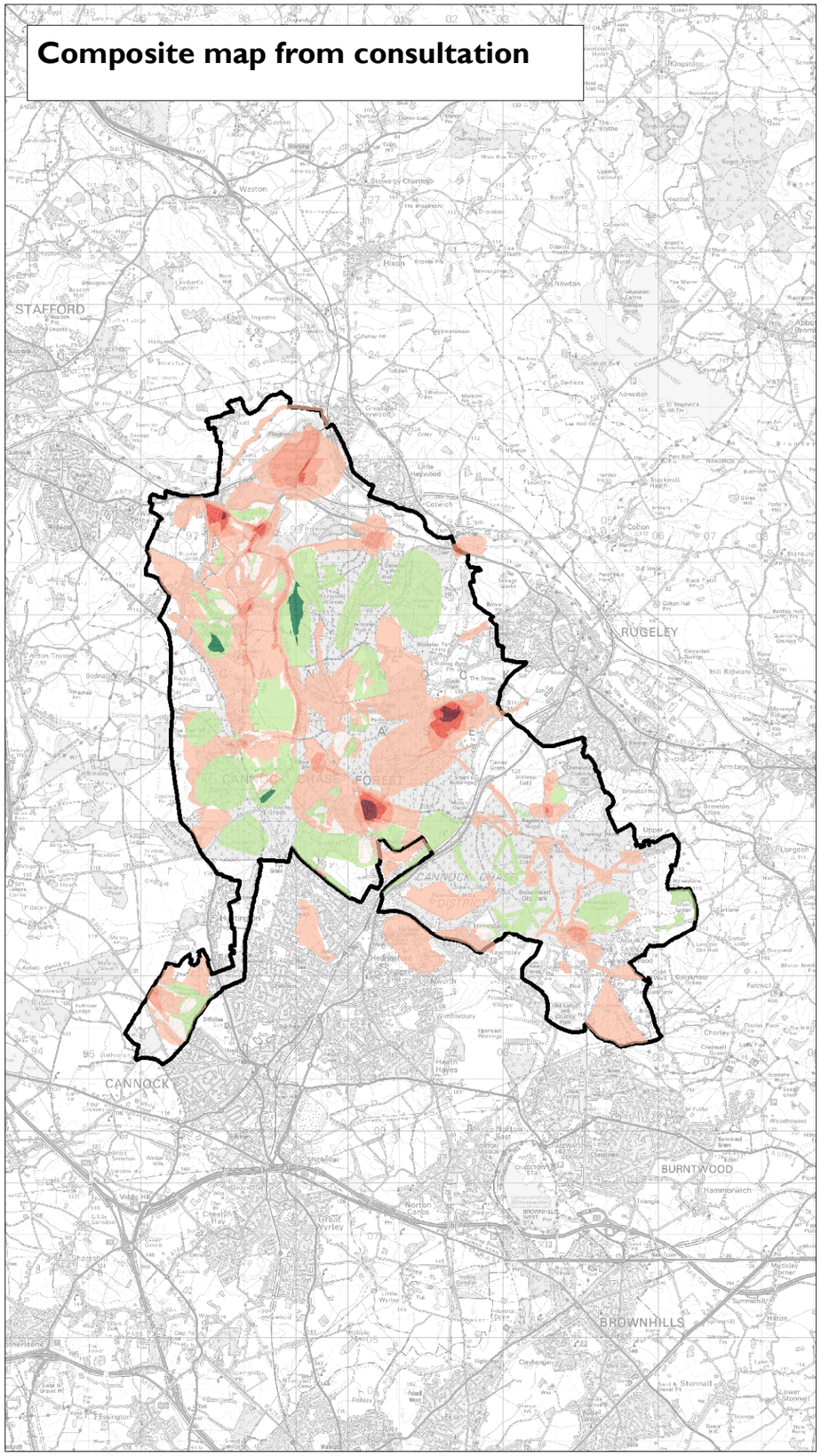
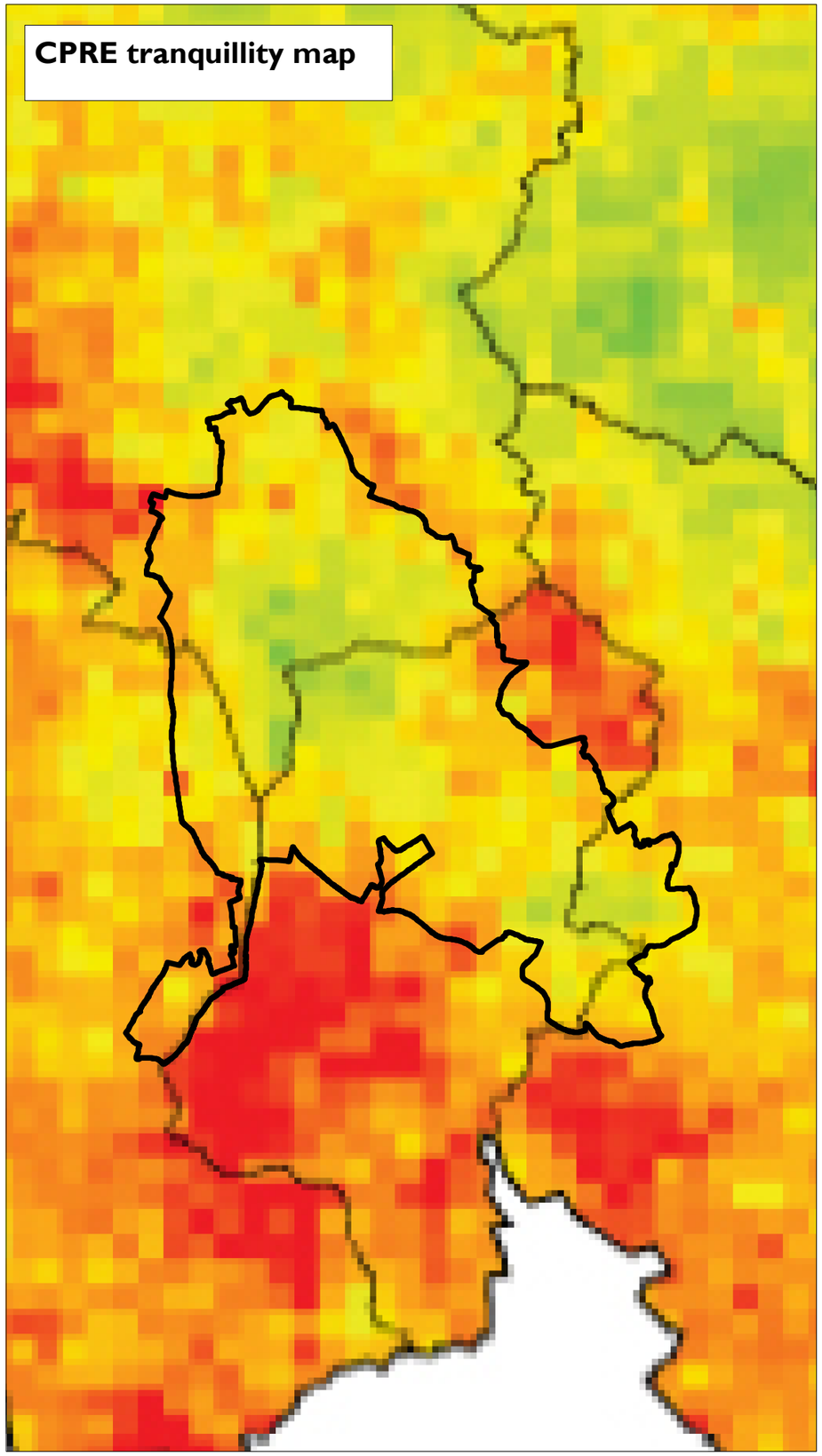
Composite map from consultation



CPRE tranquillity map



Cannock Chase AONB Tranquillity Mapping

Figure 6: Comparison of composite map and CPRE tranquillity mapping

Key

Composite score

Highest combined recreational impact

Lowest combined recreational impact

Cannock Chase AONB

CPRE map

Most tranquil

Least tranquil

N
W E
S

0 0.375 0.75 1.5 Km

Source: Consultation work carried out by Cannock Chase AONB.
CPRE mapping (c) CPRE, Natural England and Northumbria University

Date: 22/03/2007
Revision:

File: S:\4000\4075 Cannock Chase AONB Tranquillity\GIS\Themes\ArcGIS9\4075-01_004_tranquillity_cpre.mxd

POTENTIAL APPLICATION OF THE CPRE METHODOLOGY WITHIN CANNOCK CHASE AONB

6.19. The CPRE national map (2006) provides one assessment of tranquillity across Cannock Chase AONB although, as already noted, it does not necessarily pick up on local circumstances. One option would be to use this model as a basis for monitoring tranquillity across Cannock Chase in the future but to ensure that it reflects the particular circumstances of Cannock Chase by either:

- creating a more detailed (finer resolution) classification than the 500m^2 model used in the national tranquillity map; or
- re-producing the model using a different weighting scheme, more locally applicable than the one developed nationally, through the Participatory Appraisal process applied specifically to Cannock Chase.

6.20. These options are explored in more detail in the next section, but it is useful at this stage to outline the GIS dataset requirements of this approach. **Section 4** of this report sets out the use of GIS data sets in the initial CPRE study developed in the North East, and a summary of these data sets is provided in **Table 5** (drawn from MacFarlane et al., 2004).

Table 5: GIS data sets needed for analysis

Data set used in CPRE analysis	Description	Notes / Potential alternative data sets
Land Cover Map (LCM) 2000	A thematic classification of satellite imagery (year 2000) into types of Landcover, provided by the Centre for Ecology and Hydrology	LCM 2000 is a relatively expensive dataset with some inaccuracies at the local scale, due to its satellite derived data. Alternative data sources could include landcover classification digitised from Ordnance Survey 1:25k base map and Phase 1 Habitat survey data, if available.
Digital Elevation Model (DEM)	A raster dataset providing elevation data	Any of the following three products could be used: Ordnance Survey Panorama; Ordnance Survey Profile; NextMap Britain DSM
OS Strategi	1:250,000 scale OS dataset of urban areas, transportation infrastructure and key environmental features such as rivers and woodland	OS Strategi is a relatively low cost data set. An alternative, more detailed product is OS Meridian 2, a 1:50,000 vector data set containing communications and topographic related features.
OS Address Point	A point dataset representing every postal address in the UK, although it does not differentiate between	An alternative product is OS CodePoint, which includes differentiation between residential and business addresses.

	residential, business and other types of address	
ONS urban area classifications	Urban areas and their population	This data is freely available from the ONS web site.
OS Oscar	Roads	Alternative data sets include: MasterMap ITN and OS Meridian 2, roads could also be digitized from the OS basemap
Digitise from OS basemap	Camping and Caravan Parks	
County Council data on Quarries	Quarries, active and inactive.	
Digitise from OS basemap	VHF masts, pylons, telecommunications masts	
BWEA web site	Windfarms	

6.21. Although the list of data sets in **Table 5** appears to be relatively simple, what makes the CPRE methodology complex is:

1. Some of the data sets above are complex in their own right, particularly when manipulating them at a regional or national scale;

2. The series of models that make use of the above data sets are complex. Skyglow, for example, is calculated as a function of distance from urban area and size of urban area, using the ONS data defined in **Table 5**.

3. Some data sets were modified slightly between the pilot work carried out in 2004, and the development of the national map in 2006.

6.22. The 2006 technical report on the creation of the national tranquility map is currently in draft format and not yet publicly released. The release of this report will enable **Table 5** to be cross-checked against the datasets used in the final analysis for the national map.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. It has been a concern within Cannock Chase AONB that the national CPRE tranquillity map, developed by CPRE in conjunction with Natural England and Northumbria and Newcastle Universities, does not adequately reflect the local circumstances found within the AONB. Distinct local patterns, such as the disturbance to tranquillity around the visitor centres, although identified in the CPRE methodology, do not appear to have sufficiently high impact to be picked up in the national map. This is likely to be due to two factors:

- that issues that are of local significance to tranquillity can be masked by other factors of perceived greater importance at a national level;
- that the 500m^2 grid used in the creation of the national map is at too coarse a scale to enable a detailed picture of tranquillity within an area the size of Cannock Chase AONB to be developed and compared over time to identify change.

7.2. Based on the findings of this short study, therefore, we suggest that within the AONB there are potentially four main options that could be used to monitor tranquillity within the AONB in the future. These are:

Option 1: Use the CPRE National Tranquillity Map (and the methodology that underpins it) accepting the limitations that have been identified through this report from the perspective of Cannock Chase;

Option 2: Develop a composite map of tranquillity based purely on maps drawn up through workshop sessions involving Cannock Chase stakeholders;

Option 3: Use CPRE data but, based on local knowledge and interviews, manipulate this data (e.g. changing the weighting used in the final model to reflect local values, as suggested under paragraph 6.19 above);

Option 4: Devise a new methodology for mapping tranquillity within Cannock Chase, based on local perceptions and interviews, with additional GIS analysis.

7.3. These options are discussed in greater detail below.

Option 1: Use the CPRE National Tranquillity Map as it stands

7.4. The first option would be to use the CPRE national tranquillity map as it stands. The benefit of this approach is that considerable work has gone into the development of the national map, including extensive consultation on what tranquillity means to different people. Complex GIS modelling is used in the map, including noise attenuation modelling, for example, which would be costly and time consuming for the AONB to produce separately.

7.5. The disadvantage of taking this approach forward is twofold. Firstly, despite the extensive participatory appraisal which went into the CPRE model, no-one within or in the vicinity of Cannock Chase was consulted on the approach, and as outlined in **Section 6** some distinct differences between the national map and the maps drawn

up during local consultation work can be seen. This may mean that the national tranquillity map is not fully reflective of the state of tranquillity within Cannock Chase AONB. Secondly, and also significantly, future monitoring of tranquillity within the AONB is beyond the immediate control of AONB staff, as the AONB has no control over when the national map is next produced.

Option 2: Draw up maps based on local consultation

7.6. This option would involve using a series of workshops at which local stakeholders would be asked to draw on maps those areas that they considered to be most and least tranquil within the AONB. The process used would be similar to that used to map the areas of highest recreational use, as described in **Section 6**. The main difference would be that consultees would be asked to take both positive and negative factors into account, and that a consistent scale (and corresponding set of colours) would be used throughout e.g. 3 or 5 classes of tranquillity to be defined on every map, ranging from not at all tranquil, to very tranquil, covering the whole of the AONB area as far as possible. The maps could be combined using a process of GIS overlay (similar to that used in **Section 6** of this report) to produce a 'consensus' map showing the perceived relative tranquillity across the AONB.

7.7. As an addition to this approach, a structured interview could also take place, asking people to define the five most important features that contribute to tranquillity for them, and the five features that most detract from tranquillity. Should there be considerable disagreement from the mapping process as to the most and least tranquil areas, these interview results could be used to help interpret the mapping and potentially produce a map that can be agreed upon.

7.8. This option has the benefit that any maps produced would be based on local knowledge and perceptions. As tranquillity is, per se, a concept entirely related to individual perception, this could provide a rigorous methodology for producing both a baseline assessment of tranquillity, and future monitoring against this baseline.

7.9. The potential drawback to this option is that the output of the consultation maps would be unknown, and until the process is complete it would be difficult to predict how successful the overlaying of the different maps would prove.

Option 3: Use CPRE methodology and data with re-weighted factors

7.10. This option could entail:

- **Option 3A**: taking the GIS grids that are the output of the CPRE method, and re-weighting the individual factors that contribute to the final score; and/or
- **Option 3B**: developing a finer-grained grid (say at 100m^2), so that the reporting of the data is more sensitive to local circumstances.

Option 3A

7.11. This option would again require a number of local workshops and interviews, to elicit local opinion as to what makes (and what detracts from) a tranquil area. The interviews would need to be structured in a very similar way to those carried out in the Chilterns AONB Tranquillity study to enable the GIS data produced in the CPRE

study to be used, but weighted differently to show results according to local definitions of tranquillity.

Option 3B

7.12. This option would require following the CPRE 2006 methodology in full, to re-produce each GIS grid produced for the national study, but at a finer scale (say 100m^2). The consultation work outlined in Option 3A would then be used to weight each grid, so that the final composite map reflected local perceptions.

7.13. Using **Option 3A** and/or **Option 3B**, it would be possible to redefine the scale of tranquillity used (as the scale used on the national map is a scale of *relative* tranquillity throughout England). In this way areas of locally important tranquillity would be more obvious as they would be relative to local rather than national circumstances.

7.14. The benefit of this approach is that the CPRE approach is an established methodology building on a considerable volume of work and public consultation. This approach would also provide a method by which national comparisons can be drawn.

7.15. The disadvantages of **Option 3A** are that:

1. data availability is unknown – even if CPRE and their researchers release the GIS data, it would need to be in a format that enables the analysis and re-weighting of the data tables to be carried out, i.e. all of the contributory raster grids drawn up and used in the final analysis would need to be available for this approach to work;

2. until the 2006 technical report (currently in draft) is released, it is not possible to say how complex the process of re-weighting the factors would be.

7.16. For both **Options 3A and 3B**, additional disadvantages are that:

3. it is very likely that the AONB would need expert help to manipulate and process the data, and this may be time-consuming and costly; and finally

4. as with **Option 1**, the AONB has no control over when the national map is next produced, so future monitoring may be difficult.

Option 4: Devise new methodology based on local perceptions and GIS analysis

7.17. The final option would be to develop a new methodology, using GIS analysis, but taking into account local perceptions specific to Cannock Chase. This option would reflect the spirit of the new CPRE methodology but would be much simplified and would be devised to clearly reflect local circumstances. It would involve a process of consultation to establish local views on what contributes to and detracts from tranquillity. It would build on the approach outlined in **Option 2,** however, in addition to creating maps of local perception, a process of GIS analysis would be used to develop a factual statement of relative tranquillity that uses datasets that reflect local factors that consultees have identified as contributing least and most to tranquillity within Cannock Chase.

7.18. To some extent the option would have similarities with the initial map of tranquillity developed for CPRE in 1995 in that it would reflect distances from various factors that either enhance or detract from tranquillity (the distances reflecting local perceptions) and would not rely on complex computer modelling that could make it difficult for the Cannock Chase AONB to replicate the monitoring of tranquillity in future years. Reflecting local adaptations of the 1995 approach (paragraph 3.6) this proposed option has the potential for:

- more factors to be introduced (both elements that enhance and detract from tranquillity); and
- the spheres of influence to be mapped more gradually (rather than e.g. 1km from a medium disturbance road being not tranquil, and beyond that being tranquil, a range of buffer zones of decreasing influence could be defined reflecting local perceptions);

7.19. Being based on local perceptions and also taking account of factors that are seen locally to enhance tranquillity as well as detract from it, the approach would also address the main criticisms of the 1995 methodology.

7.20. The use of this approach would allow Cannock Chase AONB to control how and when the baseline for monitoring tranquillity is developed, and also to control when further monitoring takes place. The devised methodology could be relatively simple, so that costs are limited and the work has the potential to be undertaken in house, potentially with the assistance of volunteers. Updates to the approach would probably require repeat consultation and mapping of any changes within the AONB.

7.21. The main disadvantage of this approach is the lack of a national comparator by which the AONB could compare itself to other protected landscapes.

Recommendation

7.22. Based on the conclusions above, we recommend that **Option 4** is taken forward as the strongest option. Although **Option 3** is a strong option, and would satisfy Action 8A of the AONB's Action Plan (to identify and agree broad areas and perceptions of peace and tranquillity within the AONB), it has the potential to be complex and expensive to replicate and would be dependent on the models used in the national tranquillity mapping being made available by CPRE or their consultants.

7.23. **Option 4**, as set out in the conclusions above, would allow Cannock Chase to:

1. develop an approach particularly suited to local needs;
2. control how and when the baseline is developed;
3. determine when further monitoring against that baseline takes place.

7.24. Although the main disadvantage of this approach, as set out above, would be the lack of ability to compare the outputs to those of other protected landscapes, we do not perceive this to be a major issue. As set out in the introduction to this report, Cannock Chase plays an important role in providing an area of local tranquillity

within a predominantly urban area, and **Option 4** would enable this relative local tranquillity to be monitored.

7.25. For these reasons, we would recommend that Cannock Chase AONB develop a new methodology for mapping tranquillity, based on local perceptions and GIS analysis.

Land Use Consultants

4 April, 2007

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APPENDIX 1

Questionnaire prepared by the Kent Downs AONB

Questionnaire

Tranquility

Please answer questions 1 and 2 by using a few key words:

1. If a countryside area were described as being 'tranquil', what features would it have ? (Examples are: open countryside; uninterrupted views; woodland; sounds, smell and views of the sea, no disturbance or unnatural noises, etc)

2. When you are in a tranquil area, how do you feel? (Examples: calm, thoughtful, energized, happy, sleepy, etc)

3. How important is tranquility to your enjoyment of the countryside? (please indicate by circling or deleting)

   a. Not very important b. Moderately important c. Very important

4. Using place names or grid references, please tell us of areas of the Kent Downs countryside where you experience tranquility (this information will not be shared publicly)

5. Would you visit these areas of the Kent Downs if they did not offer tranquility? (please indicate by circling or deleting)

   a. Yes b. No c. Maybe

6. What activities do you generally undertake in these tranquil areas ? (please indicate by circling):

   Walking Running Cycling Horse riding Fishing
   Wildlife watching Photography/Painting/other artistic activity
   Other (please specify)

Non-Tranquility

7. Please indicate, on a scale of 1 (lowest score) to 3 (highest score) which of the following are negative features that detract from your experience of tranquillity in the countryside:

Detractor from Tranquillity

Scoring 1 – not very disturbing , 2 – moderately disturbing, 3- very disturbing

	Score		Score
Presence of other people		Road, train and urban area noise	
Visibility of roads		Aircraft noise	
Visibility of urban development		Military training noise	
Visibility of pylons, telecom masts, wind turbines etc		Unnatural or unpleasant odours	
Artificial light at night		Mechanical or electromagnetic vibrations	
Visually Intrusive clutter eg, horse jumps, buckets etc			
Fly tipping etc			
Others (please specify)			

8. Using place names or grid references, where in the Kent Downs, have you experienced disturbance that has detracted from tranquillity?