

# TRANQUILLITY AND RELATIVELY QUIET AREAS.

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## 1 Introduction

With the publication of the Rural White Paper and the EU Directive on Environmental Noise the issue of tranquillity and relatively quiet areas has become a matter of current debate. In this paper it is the aim to consider the nature of tranquillity and relatively quiet areas, to question how such areas can be measured and monitored, to consider the possible means of protecting these areas from future noise intrusion. Within the EU Directive there is a distinction made between relative quiet areas within towns and cities and relatively quiet areas in the countryside (see below). This paper will only consider quiet in the countryside but some of the discussion will apply to quiet areas within agglomerations. The paper does not have precise answers to difficult and often nebulous questions but it is hoped it will encourage, and even provoke, further discussion

## 2 The meaning of tranquillity

Looking through the various references to tranquillity there is some divergence over the meaning of the term. A dictionary definition<sup>3</sup> gives tranquil as 'calm, serene, unruffled', with no specific reference to noise. In the Rural White Paper it is more implicit that tranquillity is seen as being a noise issue. To quote from Section 9.4: Promoting Tranquillity

*9.4.1 It is not just its physical features which gives the countryside its unique character: there are less tangible features such as **tranquillity and lack of noise** and visual intrusion, dark skies and remoteness from the visible impact of civilisation. Here tranquillity and lack of noise are linked.*

*9.4.2 There will always be sources of noise in the countryside, and many of these –such as noise from harvesting and livestock – are themselves representative of activities that are central to the rural way of life. But protecting the countryside from further intrusion of noise is not a luxury. It is about preserving and promoting a feature that is genuinely valued by residents and visitors alike. Noise can also disturb the breeding of vulnerable species and thereby undermine biodiversity.*

- *We will consult next year on a national noise strategy. The strategy will include mapping the main sources and areas of noise.....The maps will enable policy to take account more accurately of the implications of*

*noise sources for rural areas, including major reservoirs of rural tranquillity and valued local pockets of tranquillity.*

The last part of that quote makes it obvious that the authors have taken tranquillity to be a noise issue and, further, one that can be modelled and predicted using noise mapping methods.

The EU directive on Environmental Noise<sup>4</sup> does not make specific mention of tranquillity instead it talks of the need to protect ‘relatively quiet areas’. For instance, Article 2, scope 1 states *‘This Directive applies to environmental noise perceived by humans in and near their homes, in public parks or other relatively quiet areas in an agglomeration, in relatively quiet areas in the open country, in and near schools in the case of pupils, in and near a hospital in the case of patients and in other noise-sensitive buildings and areas.* Here a distinction is drawn between relatively quiet areas in an agglomeration and relatively quiet areas in the open country. Article 3 explains these terms as

“relatively quiet areas in an agglomeration”, means an area, delimited by the competent local authority, which is not exposed to a value of  $L_{den}$  greater than a certain value, to be declared by the Member State.

“relatively quiet areas in the open country” means an area, delimited by the competent national or regional competent authority, that is undisturbed by noise from traffic, industry or recreational activities and where natural quiet can be experienced.

This latter definition is in line with the definition of Tranquillity that has been used by UK Quiet Pages web page<sup>5</sup>; *“ an area which is largely free of man made intrusive noise, but where the soundscape is largely dependent upon naturally occurring sounds...”*

Similarly the Council for the Protection of Rural England define Tranquil Areas<sup>8</sup> as *“places that are sufficiently far away from the visual or noise intrusion of development or traffic to be considered unspoilt by urban influences.”*

## **2.1 Actions require by the EU Directive.**

The EU Environmental Noise Directive requirements for noise maps concentrate upon major agglomerations, and transport routes. This will result in the mapping of only noisy areas, which is at odds with the Rural White paper statement that noise mapping will be used to identify tranquil areas unless it is taken that everywhere not within the planned set of noise maps is tranquil! The Directive also requires competent authorities to act upon the noise maps and to formulate action plans that include actions to maintain relatively quiet areas; this can only apply to relatively quiet areas within existing noisy areas. However it should be noted that Article 31 of the Directive requires member states to report in December 2007 their strategy for the preservation of relatively quiet areas in the open country.

### 3 Noise In the Countryside

There are some areas of the world where absolutely no roads, railways and buildings are present and the land can be considered to be untouched by mankind. These 'wildernesses' are remote and, having escaped human intrusion and retaining their natural ecology, will be the closest to natural tranquillity to be found on this planet. There are few areas within the British Isles can be considered to be a wilderness.

Britain is a crowded densely populated island with a highly developed transport infrastructure. The majority of the population reside in town and cities surrounded by countryside but the transport routes which link together the centres of population traverse the rural areas and in so doing bring noise to the open countryside. Whilst transportation noise dominates the whole noise climate of Britain, there are a numerous other sources of noise within the countryside.

Modern agriculture is heavily dependant upon machinery for all types of farm work. The numbers and size of farm machinery is ever increasing and as a result the noise from farming is ever louder. Even hill farms that once only echoed to the sound of the shepherd whistling to his sheep dog are now overrun with quad bikes ore hill and dale. Mountain and moorland, the closest that Britain gets to wildernesses, often suffer from noise from quarries and open cast mining. These remote areas are also often subject to military noise. Artillery practice, field exercises and low-level jet aircraft are all examples of loud military noise sources found in the countryside. Power stations are often located in the countryside well away from towns and cities and the noise from windpower generators should not be forgotten.

Natural noise sources can often be significant. Cattle and sheep at night can make enough noise to disturb the sleep of the visiting townie or others new to the countryside. The 'dawn chorus' can raise noise levels in the vicinity of hedgerows and trees well above 70 dB. Even insects can create local pockets of high noise levels. Rivers and streams are potent sources of noise especially when there is rapid turbulent flow over waterfalls, weirs and mill races.

The result of the many and varied noise sources within the countryside is that the resulting noise climate is complex and constantly changing. Many of the noise sources are transitory; varying in the duration, frequency and time of day in their occurrence. In a recent study Rimmer found that the diurnal variation in noise in the countryside was very similar to that found in towns<sup>6</sup>. Other noise sources will occur only seasonally or vary with the weather. Thus the soundscape of the countryside is not bland, placid and unvarying but is a complex mix of both man-made and natural noises constantly changing from minute to minute, from hour to hour, from day to day and from season to season.

## 4 Defining Tranquillity in Measurement Terms

If Tranquil Areas are to be monitored then it would be useful if tranquillity could be defined in terms of a noise index that could be measured simply using a sound level meter.

It is unlikely that the normal environmental noise index, the equivalent continuous noise level,  $L_{Aeq,T}$  will be suitable due to the very varying nature of noise in countryside areas. The energy averaging nature of the  $L_{Aeq,T}$  will give undue weight to any high noise levels, no matter how transitory. A low value of  $L_{Aeq,1hour}$ , say 25 dB, would be a positive indication of a quiet environment but would be unrealistic as a monitoring level, as any slightly noisy event would push the  $L_{Aeq,1hour}$  above the limit.

Statistical indices such as exceedance levels do offer the means of excluding noise levels at the extremes, either the very high or the very low, from the measurement. The standard background indicator  $L_{90}$  would miss out too much detail. At the top end,  $L_{10}$  might be a possible useful index as it would include all but the loudest sounds but how well  $L_{10}$  values relate to the subjective assessment of tranquillity is unknown. Another possibility would be to use exceedance levels to define a range such as  $L_{10} - L_{90}$ . This could be used to specify a noise climate within suitably narrow boundaries.

There are two further major problems with the use of sound level measurements to define or monitor tranquillity:

- Sound Level Meters are dumb. They measure all sounds and without advanced processing techniques it would not be easy to separate the man made or unwanted sounds, noise, from the natural or wanted sounds, tranquillity.
- Tranquillity, like its antithesis noise, is subjective. Any individual's perception of tranquillity will be a complex mix of the nature, content and level of the sound filtered through the individual's preferences, preconceptions and prejudices. Thus any tranquillity index must take into account the subjective nature of our response to quiet. As we have NOYS for annoyance perhaps we need the Prosac index for tranquillity. There is a clear need for serious research into the whole concept of perception and acceptance of quiet and tranquil sound environments.

## 5 Identification of Tranquil Places

There are several means that could be employed to identify Tranquil areas;

### 5.1 Baseline Survey

A nationwide survey along the lines of the National Noise Incidence Study (NIS)<sup>7</sup> could be carried out. The NIS sampled the noise climate over 24 hours outside 1000 residence across England and Wales during 2000. Such a survey for tranquillity would be a magnitude more difficult. A

rationale for deciding where, when and how many sites to monitor will not be easy to settle. The measurements would need to be manned- how else would we know what was significant? Only a very large and therefore expensive survey could hope to establish where and when tranquil areas exist. Last year Waugh<sup>9</sup> reported to this conference the intention to carry-out such a baseline study in Ireland; as yet it has not been reported how easy or difficult it has been to carry out that study. I suspect that it would be more difficult than first envisaged to get clear meaningful results from such a survey.

## 5.2 Noise Source Avoidance Model.

In a joint project the Council for the Protection of Rural England, CPRE and the Countryside Commission commissioned Ash Consulting Group in 1995 to map the Tranquil Areas of England. Using the criteria that Tranquil Areas are places which are sufficiently far away from the visual or noise intrusion of development or traffic to be considered unspoilt by urban influences, the Tranquil Areas were determined by distances from the various disturbing factors listed below;

- **4 km** from the largest power stations.
- **3 km** 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.
- **2 km** from most other motorways and major trunk roads such as the M4 and A1 and from the edge of smaller towns.
- **1 km** from medium disturbance roads i.e. roads which are difficult to cross in peak hours (taken to be roughly equivalent to greater than 10,000 vehicles per day) and some main line railways.
- A Tranquil Area also lies beyond **military and civil airfield/airport noise** lozenges as defined by published noise data (where available) and beyond very extensive **opencast mining**.

Deciding on the distances was an iterative process of comparison between each type of disturbance in the field. The resulting maps provided a broad brush picture of areas in the countryside which are free from urban intrusion. This allowed CPRE to estimate of the change in Tranquil Areas between the 1960s and the 1990s (see table 1).

Tranquil Areas were drawn with a minimum radius of 1 km. This criterion eliminates local effects. Linear elements including low disturbance roads, 400kV and 275kV power lines and busy railways were treated as lines 1km wide of low-level disturbance. Within Tranquil Areas various sites also fall into this lower level of disturbance category, including 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.

**Table 1 Results of Tranquil Area Mapping.**

	1960s	1990s	
<b>Area of tranquillity in England (sq km)</b>	91,880	73,012	<b>21% loss</b>

<b>Percentage of England which is tranquil</b>	70%	56%	<b>14% reduction</b>
<b>Average size of tranquil area in England (sq km)</b>	193	52	<b>73% reduction</b>

### 5.3 Utilisation of Designated Areas

Within the UK there are two categories of natural areas recognised by legislation and planning controls. These are National Parks and Areas of Outstanding Natural Beauty (AONB). National park designation is regarded as conferring the highest states of protection as far as landscape and scenic beauty are concerned. In addition to being areas worthy of conservation National Parks must have extensive opportunities for recreation. Designated regulatory authorities manage National Parks and are instrumental in enforcing planning restrictions. Planning restrictions also protect areas of Outstanding Natural Beauty but AONBs are under the control of the local authority for the area. There are 37 AONBs in England and they cover 15% of the land area; many of the AONBs have been proposed as National Parks but do not meet the criteria for public access and recreational opportunities. There are currently 8 National Parks in England.

As both National Parks and AONBs are protected regions of countryside, subject to restrictions on development within their boundaries, then they ought to be tranquil areas. However a comparative study<sup>10</sup> of the Tranquil Area maps with the Norfolk National Park and the Norfolk Broads AONB showed little correspondence between the three methods of identifying tranquil areas.

This is perhaps not surprising for a number of reasons. The designation of National Parks and AONBs is not made upon the basis of an objective noise standard. Such conservation areas will historically contain active noise sources such as quarries or power stations. National Parks will be crossed by many roads if they are to fulfil their recreational aspirations. Recreational activities themselves can create noise problems within National Parks. For example, the noise from water-skiing on Lake Windermere was once a cause célèbre.

## 6 Framework for Action

Despite the difficulties, conservation areas do offer a framework for action on Tranquillity. Conservation areas are already subject to planning restrictions, some of which will include noise control. Rather than chasing what might prove an elusive definition of an objective noise index for tranquillity, rather than searching for a method for monitoring relatively quiet areas, rather than seeking out the quietest, remotest regions in the countryside perhaps the most effective approach to the protection of relatively quiet areas will attempt to build upon what already exists. The existing conservation areas could be designated as areas requiring protection from future noise intrusion. This pragmatic approach has the

virtue of simplicity. It does not require extensive monitoring of baseline noise levels. It does not have to wait upon the results of the national noise mapping exercise. It would allow the appropriate authorities to develop proactive policies designed to limit or even reduce noise within the conservation areas. Government funding could be directed to encourage the adoption of noise reduction measures in the conservation areas. Action on noise could be linked to other initiatives to protect the environment of the countryside.

## **7 Recommendations**

### **7.1 Research**

Our understanding of the human response to tranquillity and quiet is demonstrably lacking. There needs to be research into all aspects of quiet noise environments. With noise, thresholds for physical harm, annoyance and acceptability can be established. For quiet, there are no standards, no agreed measures of acceptability and not even a consistent definition of tranquillity. It should not be assumed that the task will be easy but there is an urgent need to engage with the concept of tranquillity at the research level. The findings of such research will be relevant to the search for peace and quiet in both the town and in the countryside.

## 7.2 Conservation Areas

The ethos of tranquillity needs to be incorporated into the management of National Parks and Areas of Outstanding Beauty. Within the boundaries of such areas there needs to be a proactive pursuit of noise reduction which could include such measures as:

- Tough noise limits on all new development
- Review of existing noise limits and a programme of progressive noise reduction implemented.
- Encouragement by grants, tax breaks or other fiscal measures for the adoption of quiet machinery within the designated areas.
- Noise Time Sharing This would allow the adoption of quiet days when noisy activities are banned within an area and the programming of all noisy activities on other days. This would allow visitors to enjoy tranquillity on the quiet days whilst still allowing commercial or leisure noise emitters to continue.
- Education. Park Rangers and others involved in the management of these areas need to be educated in environmental acoustics to enable them to develop noise control regimes appropriate for their individual circumstances.

## 8 References

1. Department for Environment, Food and Rural Affairs, 'Towards a National Ambient Noise Strategy, A Consultation paper from the Air and Environmental Quality Division', November 2001.
2. HMG, 'Our Countryside; the future – A fair deal for Rural England' Command 4909.' The Stationery Office, November 2000.
3. The Concise Oxford Dictionary, 9<sup>th</sup> edition, Oxford University Press, 1995.
4. EU Directive 2000/0194. 'Directive of the European Parliament and of the Council relating to the assessment and management of environmental noise.' April 2002.
5. UK Quiet Pages, <http://www.ukquietpages/tranquilareas>.
6. Rimmer C, 'The Diurnal Variation in Environmental Noise Levels'. M Sc Project Report, University of Derby, 2002.
7. P Wright, CJ Skinner, CJ Grimwood, The National Noise Incidence Survey 2000/2001 (England and Wales). BRE Client Report No:203938f



8. Council for the Protection of Rural England,' The Tranquil Areas of England', <http://www.cpre.org.uk/policy/rural/tranquil/>
9. D Waugh,' Development of a methodology to evaluate environmental noise baseline levels and establish environmental quality objectives for noise in relatively quiet areas', Proc. Institute of Acoustics, Autumn Conference 2001.
10. T Pickering, M Armstrong, S Kennedy, N Whitely & N Madoc-Jones, 'The Tranquil Areas Report – what basis for defining wilderness areas?'  
[www.geog.leeds.ac.uk/people/s.carver/student\\_work/](http://www.geog.leeds.ac.uk/people/s.carver/student_work/)