



Preserving 'natural quiet' the easy way

A recent study presents a cost and time-effective way to identify areas with particularly low levels of noise pollution. The recommended method will make it easier for EU Member States to recognise quiet areas which could offer great health and ecological benefits, as well as meeting one of the Environmental Noise Directive requirements.

More than 30% of the European population experiences noise levels that disrupt sleep or speech, and 20% are regularly exposed to noise levels that scientists consider an unacceptable health risk. To reduce noise exposure and preserve the high biodiversity that naturally quiet areas offer, the EU Environmental Noise Directive (END)¹ requires Member States to identify and preserve areas that currently experience very low levels of noise from human influences, known as Quiet Areas (QAs). However, very few Member States have done so effectively because measuring how sound varies in time and space is technically very difficult.

The new study, co-funded by Greece and the European Union under the European Social Fund (ESF), identified open country QAs in Greece based on the distance from various sources of human-made noise, including road traffic, railway noise, residential areas, industrial noise, aircraft noise, ports, construction sites and sport/leisure facilities. To do this, each source of noise in Greece was located using the Corine Land Cover Database 2000 (CLC2000) and the researchers calculated how far the noise was expected to travel. When all the noise sources were mapped, areas of land over 10 km² that did not fall within the range of any source of noise were identified as potential QAs.

Using this method, the researchers identified 765 potential QAs in Greece, covering 65,126km² or nearly 48% of the country. In 24 out of the 51 prefectures that make up Greece, less than 50% of the territory was identified as a potential QA. Only two prefectures had QA coverage of over 70%. In the most populated areas of Greece, Attiki and Thessaloniki, QAs covered less than 20% of the land. Most QAs in the country contained either agricultural land (738 out of 765) or forest semi-natural areas (705 out of 765). Wetlands and water bodies featured in relatively few QAs (69 and 97, respectively), since the surrounding areas are often used extensively by humans.

Among agricultural QAs, the largest percentage of land was classified according to the CLC2000 database as 'principally occupied by agriculture with significant areas of natural vegetation' (10.9%). A further 7.5% was classified as 'non-irrigated arable land'. Among the forest semi-natural QAs, sclerophyllous vegetation was the most common (20%), followed by broad-leaved forests (12.6%), transitional woodland scrub (12.2%) and natural grassland (11.3%).

The results suggested that QAs tend to be clustered together, rather than distributed randomly, and that they can be found at all altitudes from 0-2800 metres, with around half (48.5%) at medium altitudes. The spatial overlap of QAs with protected areas indicated that the high biodiversity, but also, recreational value of these areas could contribute to the Convention of Biological Conservation's requests towards achieving the 2020 Aichi biodiversity targets. Distance-based measurements are not as accurate as true measurements of noise levels, which the European Commission recommends Member States to implement through END's guidelines. However, detailed noise data over large geographical areas are not yet available in Greece, and the cost of doing so could be prohibitive.

This distance-based method could be a first step towards identifying QAs in Greece and other Member States, since it can be carried out quickly, over large areas and by non-experts. To see how reliable the method is, the noise levels in the identified QAs now need to be checked against ground truth data (data collected from cartography, meteorology, analysis of aerial photographs, satellite imagery or other remote sensing techniques) on noise measurements in the field, say the researchers.

1. See: <http://ec.europa.eu/environment/noise/directive.htm>

Source: Votsi, N.E.P., Drakou, E.G., Mazaris, A.D., Kallimanis, A.S., Pantis, J.D. (2012). Distance-based assessment of open country Quiet Areas in Greece. *Landscape and Urban Planning*. 104; 279-288. DOI: 10.1016/j.landurbplan.2011.11.004.

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