



NEW ITALIAN NATIONAL CRITERIA TO IDENTIFY AND MANAGE QUIET AREAS IN AGGLOMERATIONS AND OPEN COUNTRY

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ABSTRACT

On 23 May 2022, the Italian decree relating to the "Definition the methods for identifying and managing the quiet areas of an agglomeration and in open country" was issued, in compliance with the Italian implementation decree of the Environmental Noise Directive 2002/49, henceforth "END".

The new decree establishes that the quiet areas are represented by areas of public use or in any case accessible to the public, dedicated to rest, recreation, and conservation of natural sound environments. They are not affected or are affected to an insignificant extent by technological sounds and to a limited extent by anthropic sounds. They are characterized by the predominance of desired sounds characteristic of the area and therefore expected by users and consistent with their expectations. Furthermore, in the case of quiet areas of an agglomeration, the value of 55 dB(A) L_{den} is preliminary defined as a limit value for noise produced by the noise sources considered in the drafting of strategic noise maps according to the END requirements. At the meantime, for the preliminary selection of candidate quiet areas in open country, minimal distances from noise sources are proposed such as to reasonably guarantee L_{den} values not exceeding 50 dB(A).

Keywords: *quiet areas; environmental noise; policy; soundscape; natural sounds.*

1. INTRODUCTION

The first EU policy to specifically target quiet areas was the Environmental Noise Directive (END 2002/49/EC). The establishment of quiet areas was necessary as one of the first strategic moves in limiting people exposure to environmental noise. Defining and preserving quiet areas is a national duty that need to be fulfilled by every EU Member State. However, the END does not define a common approach: several Member States implemented methodology of actual sound-pressure level measurements and mapping. Furthermore, there is a need for further development of pertinent methods that allow to evaluate how the soundscape is perceived [1].

The European Environmental Agency has issued several reports in the last years providing guidance on the definition of quiet areas and giving examples of policies established by Member States or other public administrations, both in open country [2] and agglomerations [3].

The Italian Legislative Decree 42/2017, by Article 3(1)(g), amended Article 4 of Legislative Decree 194/2005, which is the implementation decree of the European Directive 2002/49 on Environmental noise. It provided that 'by decree of the Ministry of Environment and Energy Security (MASE), adopted on the proposal of the Italian Institute for Environmental Protection and Research (ISPRA), the modalities for the identification and management of the quiet areas of an agglomeration and of the quiet areas in open country', defined by the same legislative decree

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194/2005, are established. In order to follow up on these requirements, ISPRA set up a technical round table to discuss and define the regulatory proposal, which was attended not only by representatives of ISPRA and MASE, but also by delegates from the National Research Council (CNR), Italian Municipalities Association (ANCI), Regional Environmental Agencies (ARPA) and Universities. The work of the round table, which lasted almost two years, led to the publication of the Italian decree “Definition of the methods for identifying and managing the quiet areas of an agglomeration and in open country” [4]. This paper describes the main contents of the decree; its implementation by the competent authorities is due before May 31st 2025 but the first examples of its use will probably be in the framework of the current round of Noise Action Plans prescribed by the European Directive 2002/49 on Environmental noise.

2. THE NEW DECREE: MAIN CONCEPTS

The quiet areas of an agglomeration and the quiet areas in open country are areas of public use or in any case accessible to the public. They are dedicated to recreation, relax and the conservation of natural sound environments characterized by geophony (i.e. sounds produced by nature, such as the sounds generated by the wind, the flowing of water, the rustling of leaves, the rain, as defined in the decree) and biophony (i.e. sounds produced by the fauna, as defined in the decree).

They are not, or only to a very limited extent, affected by technological sounds (i.e. sounds generated by sources - fixed or mobile - created and used by humans such as transportation systems, industries, music, plants, as defined in the decree) and are characterized by the predominance of desired sounds which are typical for the area and therefore expected by users and consistent with their expectations; these areas are considered as areas of good acoustic quality.

For the first time in an Italian law, the decree introduces the concept of “quality” connected to environmental noise, which is always treated as a physical agent to reduce and mitigate in the pre-existing part of the national legislation. The decree defines “good environmental acoustic quality” as “acoustic condition of an environment characterized by the predominance of desired sounds, such as sounds of biophony and geophony (natural sounds), corresponding to the identity features of the area and therefore expected by the users and such as to ensure conditions of quiet, recreation, relief”.

In the case of the quiet zones of an agglomeration, whose delimitation is the responsibility of the competent authority, a limit value of 55 dB(A) Lden is defined for the noise produced by the noise sources considered in the drawing up of strategic noise maps (transportation, industrial plans) according to END requirements. As far as quiet areas in open country are concerned, the Regions assist the municipalities in their preliminary proposal, according to the alternative modalities established by the decree, and proceed to the subsequent final delimitation of the areas to be identified as quiet ones.

The decree regulates the management of the previously identified quiet areas and provides for the establishment at the MASE of a database of quiet areas, designed and set up by ISPRA, for the collection and dissemination of data to the public as well as for the communications that the MASE itself must periodically make to the European Commission.

3. CRITERIA FOR IDENTIFYING QUIET AREAS IN AGGLOMERATIONS

The delimitation of quiet areas in an agglomeration, whether existing or planned, is done by adopting acoustic and non-acoustic criteria: some criteria are mandatory, while others can be used optionally to support the assessment.

As far as mandatory acoustic criteria are concerned, these can be summarised as follows:

- a) areas with $L_{den} \leq 55$ dB(A), which can be identified using the corresponding equal noise contour line of strategic noise mapping of the agglomeration;
- b) acoustic class of the municipality acoustic zoning plan¹ no higher than III.

Instead, the mandatory non-acoustic criteria stipulate:

- c) territorial extension of at least 3,000 m², subject to the provisions for quiet zone networks (see letter h);
- d) appropriate use of municipal urban plans: e.g. areas of prevailing natural, landscape, archaeological, architectural and historical-artistic interest.

¹ The Italian Framework law on noise pollution requires each municipality to classify its territory using six different acoustic classes: Class I (areas of special acoustic protection, as schools and hospitals), Class II (mainly residential areas), Class III (mixed areas), Class IV (areas of intense human activity), Class V (mainly industrial area) and Class VI (exclusively industrial area). Noise limits changes according to each class, from lower (highest protection, Class I) to higher (lowest protection, Class VI).

The optional criteria provide the competent authority with the possibility of introducing additional, more restrictive conditions:

- e) $L_{den} \leq 50$ dB(A) or territorial extent of the quiet zone greater than 10,000 m²;
- f) facilitation of pedestrian accessibility in the delimitation of a new quiet zone, subject to acute planning, in order to pursue social equity conditions;
- g) analysis of perception aspects related to the use of the quiet zone, in particular regarding the description of the soundscape (with reference to ISO 12913 standard series [5]);
- h) definition of a network of quiet zones in an agglomeration: in the presence of several areas smaller than 3,000 m², of which it is intended to protect the acoustic quality, the authority may identify a network of quiet zones within the agglomeration, interconnected by spatial contiguity, such as pedestrian paths and spaces or cycle paths.

Figure 1 shows a flow chart of the planned activities for the identification of quiet zones within an agglomeration.

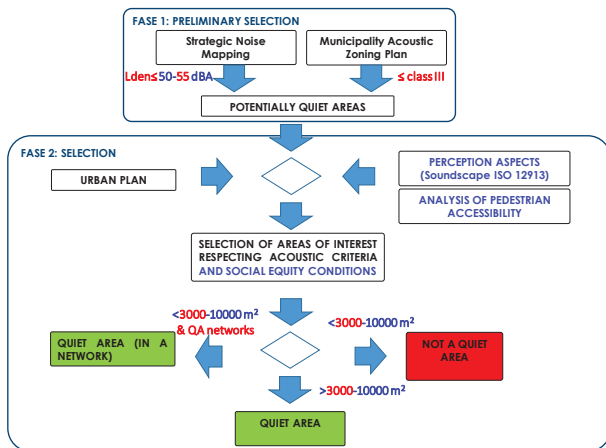


Figure 1. Flow chart of the planned activities for the identification of quiet areas in an agglomeration, with mandatory criteria indicated in red and optional criteria in blue.

4. CRITERIA FOR IDENTIFYING QUIET AREAS IN OPEN COUNTRY

Quiet areas in open country, whether existing or planned, are characterized by the prevalence of natural sounds that induce perceptual feelings of tranquility. Also quiet areas in open country are identified by

adopting acoustic and non-acoustic criteria, some mandatory, others optional.

With reference to the mandatory acoustic criteria, the identification is in the first instance carried out on the basis of the acoustic climate of the area, which must not be affected by noise from transport infrastructures, industrial activities or recreational activities, but it should be characterized by the prevalent presence of natural sounds (bio- and geophony). For a preliminary selection, information from noise maps (road, railway, airports), where available, should be used in order to identify directly or indirectly (by calculation or modelling simulations) those portions of the territory with values equal to or lower than 50 dB(A) L_{den} . Where data are not available, distances from noise sources, as defined in the decree can be used to reasonably ensure that L_{den} values do not exceed 50 dB(A) (Table 1).

Another mandatory criterion is the acoustic zoning plan of the municipality, with respect to which only areas in classes not exceeding III are considered suitable.

Table 1. Distances considered suitable from the sources considered (elaboration based on data published in EEA Report 14/2016 [3])

Noise source	Suitable distance (m)
Road axes, with the exception of local roads	> 3300
Railway axes	> 2000
Major airports (as defined by Directive 2002/49/CE)	> 4500
Other airports, airfields, and helipads	> 2700
Industrial, ports and recreational activities ²	> 2200

A further selection is then made on the basis of non-acoustic objective criteria, relating to a minimum size of the area, which must be (subject to specific exceptions) equal to or greater than 5 km², and to its intended use, as defined by the territorial and urban planning instruments in force, with respect to which areas characterized by natural, landscape, archaeological, architectural,

² Defined by the decree as “recreational and amusement activities, carried out on a non-occasional basis throughout the year, with a significant noise impact such as amusement and theme parks, maritime, lake, and river establishments, discos, and sports activities and facilities.”

historical and artistic value are identified (e.g.: protected natural areas, Natura 2000 Network areas, etc.). Finally, optional criteria, which can be adopted in addition to the mandatory criteria, are related to the analysis of perception aspects and the description of the soundscape (ISO 12913 standards), the use of additional noise descriptors, the application of the methodological scheme for the calculation of the Quietness Suitability Index, QSI [2] and the assessment of noise impact due to overflight routes.

Figure 2 shows a flow chart of the planned activities for the identification of quiet zones in open country.

5. QUIET AREAS MANAGEMENT

A distinction must be made between management measures whose application is mandatory and those whose application is optional.

Compulsory management methods include measures to preserve quiet zones, which have to be provided by the competent authorities in the action plans compliant to the END.

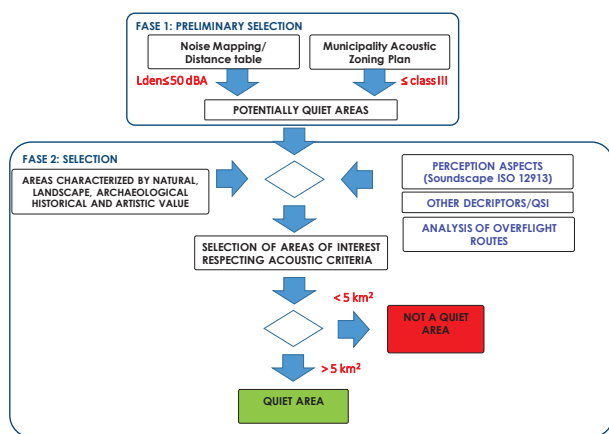


Figure 2. Flow chart of the planned activities for the identification of quiet areas in open country, with mandatory criteria indicated in red and optional criteria in blue.

Furthermore, for the quiet areas of an agglomeration, the achievement of the objective of avoiding noise levels increases must be verified and reported within the updates of the strategic noise map and the action plan. The decree also requires that the territorially competent municipalities request a careful assessment of the noise impact generated

on the quiet zone by planned new activities/settlements before releasing the building authorization.

Finally, measures aimed at the conservation of quiet areas in open country must be adopted in cohesion and synergy with the protection actions already defined for protected natural areas and/or belonging to the Natura 2000 network, archaeological areas, etc..

Concerning the optional management modes, competent authorities may carry out noise monitoring activities, plan the delimitation of new quiet areas following remedial actions, and ensure integration and synergy with the actions planned by the management tools of other environmental matrices.

6. CONCLUSIONS

The Italian Decree relating to the “Definition the methods for identifying and managing the quiet areas of an agglomeration and in open country” contains mandatory and optional criteria that competent authorities need to follow in order to define quiet areas in compliance with the Directive 2002/49/CE on environmental noise.

As many decrees in Italy, the law requires that its implementation does not result in new or increased burdens on the public finance. For that reason, at least the mandatory criteria were defined with simplicity for the public administration as the main goal. They, therefore, provide for the use of data already held by the relevant authorities, without the need for costly and time-consuming new measures or analyses. Nevertheless, innovative concepts for the Italian environmental noise policies, such as the introduction of the concepts of acoustic quality (whereas the Italian law consider noise only in quantitative terms as a problem to solve) and soundscape, are introduced even if only as optional criteria. However, this is the first step toward an environmental acoustics management policy in Italy that sees not only noise as a form of pollution to be combated but also considers positive and desired sounds and define concrete actions to protects them.

7. ACKNOWLEDGMENTS

The authors would like to dedicate this paper to the memory of their colleague Rosalba Silvaggio, who was the main author of the Italian decree relating to the “Definition the methods for identifying and managing the quiet areas of an agglomeration and in open country”. The authors cherish memories of her kindness and professionalism.

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