

OASES OF QUIETNESS IN THE SATAKUNTA REGION -

A pilot study of low-noise areas in Satakunta region

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ABSTRACT

The aim of the pilot study of low-noise areas in Satakunta was to identify regionally important quiet areas in Satakunta - oases of quietness - and to develop terminology and methods suitable for establishing the location of quiet areas. The study also served as background research for the purposes of the Satakunta regional plan. The Ministries of the Environment and of Transport and Communications funded the work, while the Regional Council of Satakunta performed the actual research work.

Quiet areas were categorised into natural, rural, urban and special quiet areas. The categorisation is based on the requirements and scale of regional land use planning. A most significant indicator is the possibility of hearing sounds of nature. Altogether there are 25 quiet areas in Satakunta that have regional importance and that met the categorisation criteria.

The methods for determining the location of quiet areas were developed and tested with the aid of expert assessments, queries to the local people, map studies, use of buffer zones, and field surveys. The aim was to develop a method or methods that are reliable, easy to adopt and applicable also to other regions. Map studies together with the use of buffer zones turned out to be the most suitable method that best met the above-mentioned criteria. Furthermore, these methods complemented one another.

1. AIMS AND IMPLEMENTATION OF THE STUDY

Today, one of the most damaging factors to the quality, pleasantness and health of our living environment is noise. The more the problem has been identified, the more quietness has come to be appreciated. On the other hand, the increasing use of machines and the many activities that generate noise have reduced the number of quiet places.

In the long term, the only way to preserve quiet areas is to take them into consideration in land use planning as separate entities. The first step is to identify the quiet areas and threats to their existence.

A pilot study of low-noise areas in Satakunta was mainly carried out in 2003. The aim of the study was to identify regionally important quiet areas in Satakunta—oases of quietness—and to develop terminology and methods suitable for establishing the location of quiet areas. The study also served as background research for the purposes of the Satakunta regional plan. The Ministries of the Environment and of Transport and Communications funded the work, while the Regional Council of Satakunta performed the actual research work.

The national steering group of the study had members from the Ministry of the Environment, Ministry of Transport and Communications, Ministry of Social Affairs and Health, Ministry of Defence, Ministry of Agriculture and Forestry, Road Administration, Civil Aviation Administration, Rail Administration, Central Union of Agricultural Producers and Forest Owners Association (MTK), Metsähallitus, Finnish Port Association and the following non-governmental organisations: Finnish Association for Nature Conservation,

the Central Association Suomen Kuulonhuoltoliitto, the Organisation Suomen Latu, the Association Suomen Akustisen Ekologian Seura and the Association Ekopsykologian yhdistys Metsänpeitto.

Sharing information and cooperation with interest groups was of great importance in the project. The theme of quietness attracted much interest and many actors contributed to the work.

2. CATEGORISATION OF QUIET AREAS

In the general guidelines for noise control, as presented by the environmental administration in 2002, quiet areas refer to environments where the sounds of nature are dominant and the noise levels from human activities are clearly below the guideline values.

According to a Government decision on guideline values for noise emission levels (993/1992), the noise level in recreation and nature conservation areas must not exceed the daytime guideline value of 45 dB or the nighttime guideline value of 40 dB. These are stricter than normal values in order to ensure that the areas provide an opportunity to enjoy nature—especially the quietness and the special natural sounds. Since that is the particular purpose of quiet areas, the guideline values referred to in the Government decision and applied to nature conservation and recreation areas also form the basis for the definition of quiet areas in this study.

The perception of noise is affected by, in addition to the average noise level, other factors such as peaks, reoccurrence, time distribution and the frequency scale of noise as well as the length of quiet periods. Therefore, average noise levels are not adequate indicators of quiet areas. To a large extent, the question is what type of values can be expected in a certain area and what the general soundscape of the area is. Thus, the expected values for quietness in, for example, urban, rural and nature conservation areas are entirely different.

For the purposes of this study, quiet areas have been categorised into natural, rural, urban and special quiet areas (Figure 1). The categorisation is based on the requirements and scale of regional land use planning. The categories are defined by soundscape description and audible sounds from human activities. A significant indicator is the possibility of hearing the sounds of nature.

In natural quiet areas, the sounds of nature are dominant, whereas sounds from human activities are infrequent and faint. The average noise level should usually remain below 30–35 dB.

In rural quiet areas, the soundscape is characterised by the sounds of nature. Sounds from human activities are subdued and intermittent. Activities typical to the area such as agriculture, forestry and boating are also part of the soundscape. There may also be distant sounds of transport routes or industry further away, the level of which should usually remain below the guideline value of 35–40 dB.

In urban quiet areas, the sounds of nature are audible and clearly detectable in the soundscape. Sounds from human activities are more subdued than other sounds in the surrounding environment. The average noise level generated by traffic and other human activity should not exceed the guideline value of 45 dB.

In special quiet areas, sounds of nature and the general soundscape play an important role. In these areas the noise level should not exceed 45 dB.

Within the scope of this study, no exact boundaries of quiet areas based on detailed noise measurements or calculation models were set. A rough model, which did not take account of terrain or land cover, was used to determine road traffic noise. The established boundaries of quiet areas were based on the following criteria: expert assessment of the spreading of noise, queries, knowledge of land use and field surveys. In practice, this was enough to meet the requirements of a regional plan referred to in the Land Use and Building Act.

3. IDENTIFYING QUIET AREAS

The methods for determining the location of quiet areas were developed and tested with the aid of expert assessments, queries to the local people, map studies, use of buffer zones, and field surveys. The aim was to develop a method or methods that are reliable, easy to adopt and applicable to other regions. Map studies together with the use of buffer zones turned out to be the most suitable method that best met the above-mentioned criteria. Furthermore, these methods complemented one another.

The potential quiet areas in Satakunta were outlined in the expert assessments on the basis of regional knowledge. In addition, the assessed areas were used to put a draft categorisation of quiet areas to the test.

In the queries, local people were asked their views about areas that are important to them and that are quieter than the surrounding environment. The regionally important "oases of quietness" were then determined by analysing their responses and comparing the results to the map studies and field surveys. The query results were also employed in defining the categorisation of quietness as well as in characterising the chosen quiet areas.

The map studies were based on gathering and outlining the existing data. First, information on populated areas and the sources and areas of noise were placed on a general map. After that the basic noise sources were surrounded with buffer zones. Thus, a map *Factors affecting the soundscape in the Satakunta region* was drawn, which showed the potential quiet areas as "white" areas outside the buffer zones (Figure 2). Information on the soundscape map was verified in a query to officials responsible for environmental matters in municipalities.

The basic assumption for determining the size of the buffer zones was that the noise emissions could not be heard outside the zone under regular circumstances. The use of buffer zones can also be called a method of elimination. In order to define the potential quiet areas, the least likely ones were ruled out.

The following distances were used as buffer zones in Satakunta (on both sides of the solid-lined source and radially around the dotted source):

- 4 km for main roads
- 3 km for areas with air and water transport, motor sport, regional roads and railways
- 2 km for local road connections

After the principal sources of noise were determined and their influence on the surrounding soundscape was assessed with the help of buffer zones, potential quiet areas were more closely evaluated on the maps. Land use played a key role in the map review; general maps were mainly used at a scale of 1:50 000 (Figure 3).

Those areas that were not ruled out in the first phase of the map study were primarily categorised into natural or rural quiet areas. In the following phase, a comparison between the results of expert assessments, queries to the local people and map studies was made. As a result, some data were reviewed. Field surveys were then launched after the target areas were identified by the map study and comparisons.

4. FIELD SURVEYS

The purpose of the field surveys was to confirm the map studies. This phase also gave an opportunity to observe significant sources of noise that had perhaps not been considered in the map studies. Surveys were made on weekdays and weeknights and on weekends, but seasonal differences could not be included in the study. The most important observations were recorded on a field survey form. In general, aural observations were carried out. A few noise measurements were also made with monitoring equipment.

As a result of the field surveys, a few areas were ruled out and the definition of some others was changed. In general, however, the results supported the previous conclusions.

Field surveys reinforced the impression that the use of buffer zones makes it possible to find quiet areas also in urban regions. However, it is necessary to take into consideration the characteristics of a particular soundscape in order to set requirements for it.

5. A PROPOSAL FOR REGIONALLY IMPORTANT QUIET AREAS IN SATAKUNTA

Altogether, there were 25 quiet areas in Satakunta that have regional importance and that met the categorisation criteria (Figure 4). These were classified into 9 natural quiet areas, 13 rural quiet areas and 4 special quiet areas. The Joutsijärvi lake and forest area, which has wilderness features, is the most important quiet area in the region. The proposed areas can be thought of as “oases of quietness”, that is, areas where it is possible to listen to the sounds of nature with only minor disturbance from human activity. However, defining and setting specific boundaries for quiet areas is difficult, as each area has its own special characteristics. For this reason, the definitions can only be in general terms.

With regard to urban quiet areas, no separate list was drafted. The reason was that not enough information was available and these areas primarily fall under general planning.

In addition to the listed areas, there are many other small areas, particularly in the countryside of Satakunta, which could meet the general criteria. Because of their small size, however, it was not justified to include them in a regional survey without a special reason.

Several quiet areas that were identified in the study were found to be important also in terms of recreation and nature tourism.

6. A BACKGROUND SURVEY FOR THE REGIONAL PLAN

This pilot study was one of the background surveys for the purposes of Satakunta regional planning. How the quiet areas will be taken into account in the plans will be clarified stage by stage during the planning process. In the future, different actors will have an opportunity to give feedback and comment on proposals for regionally important quiet areas as part of regional planning process.

7. HOW TO PROMOTE THE PROTECTION OF QUIET AREAS

The report of the study includes several ideas on how to promote the protection of quiet areas. In general, the most important measures seem to be an interdisciplinary approach, the integration of environmental considerations into planning, absence of prejudice, and cooperation.

According to the Government Resolution of 13 February 2003 on the development of recreation in natural areas and nature tourism, Regional Councils are required to examine the most significant quiet areas in terms of recreation and nature tourism and to establish requirements for the maintenance of these areas. The Ministry of the Environment hopes that this pilot study will be of help in completing corresponding studies in other regions and in promoting the mapping and maintenance of quiet areas in connection with more detailed planning and project design.

NATURAL QUIET AREAS

- **The sounds of nature dominate** the soundscape ⇔ it is possible to enjoy the sounds of nature, be at peace and achieve tranquillity.
- Sounds from human activities are infrequent and faint.
- Typically, areas located far from built-up areas, such as large forests, recreation areas, nature conservation areas, and areas reserved for purposes of conservation, including their surroundings.

RURAL QUIET AREAS

- **The sounds of nature characterise** the soundscape ⇔ it is possible to enjoy the sounds of nature and the general tranquillity of the soundscape.
- There are sounds generated by human activities but they are subdued and intermittent. Many of the sounds are typical of the soundscape, such as sounds from agriculture, forestry and boating.
- Typically, sparsely populated rural areas, areas with agriculture and forestry activities, and archipelago and seaside areas.

URBAN QUIET AREAS

- **The sounds of nature are audible** and clearly detectable in the soundscape.
- Sounds from human activities are more subdued than other sounds in the surrounding environment and do not conceal natural sounds.
- Typically, recreation areas, residential areas with no through-traffic or vast park areas nearby or within built-up areas.

SPECIAL QUIET AREAS

- In special quiet areas, sounds of nature and the general soundscape are of primary importance. Examples of such areas include world heritage sites or areas of special attraction to tourists, or the amenity value of the soundscape may be related to a certain time of the year or day.

Figure 1. Categorisation of quiet areas in the pilot study of low-noise areas in Satakunta.

Factors affecting the soundscape in the Satakunta region

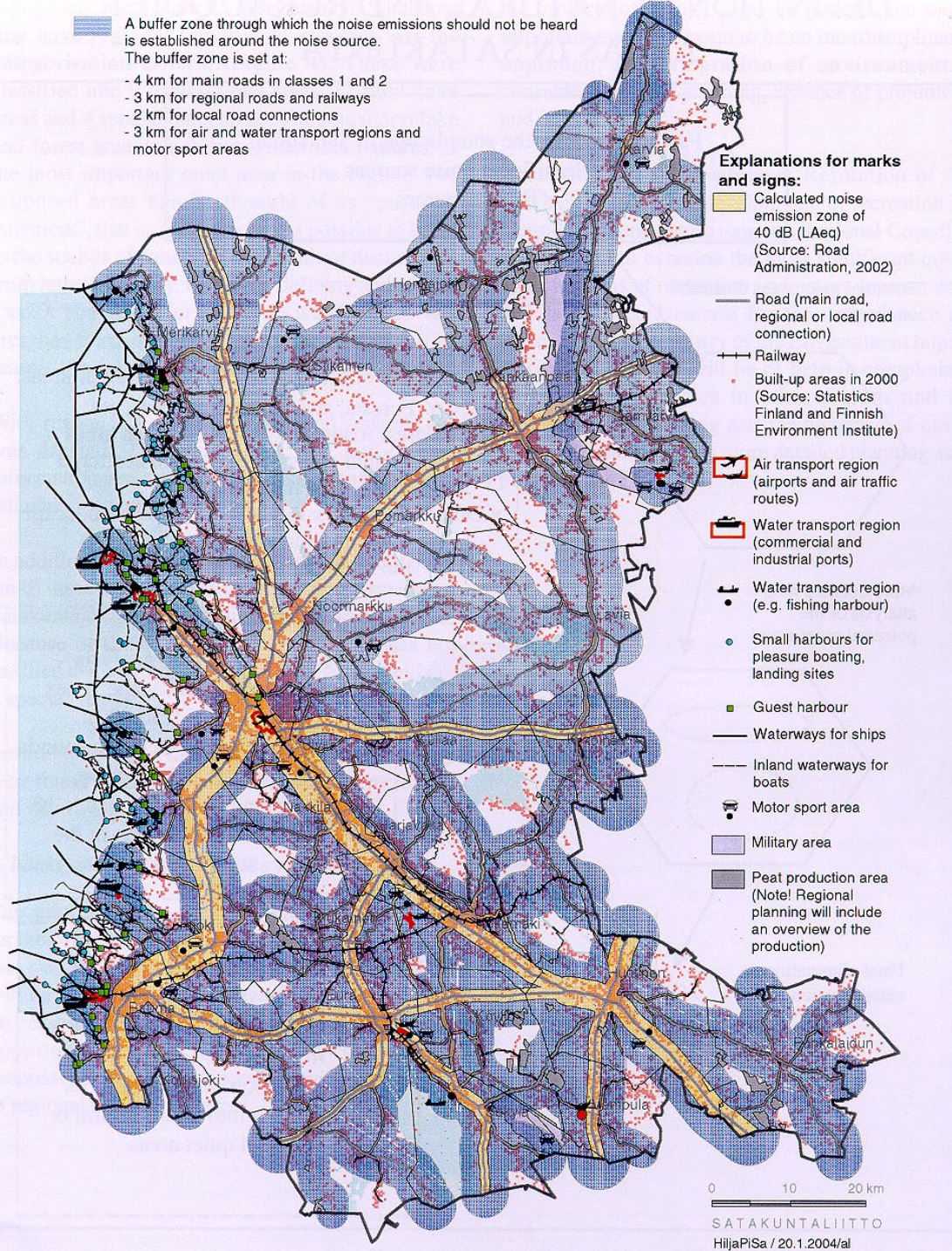


Figure 2. Factors affecting the soundscape in the Satakunta region. In white areas, sounds from human activities (especially traffic) are more subdued than other sounds in the surrounding environment.

A MORE DETAILED DESCRIPTION OF THE DEFINITION OF NATURAL AND RURAL QUIET AREAS IN SATAKUNTA

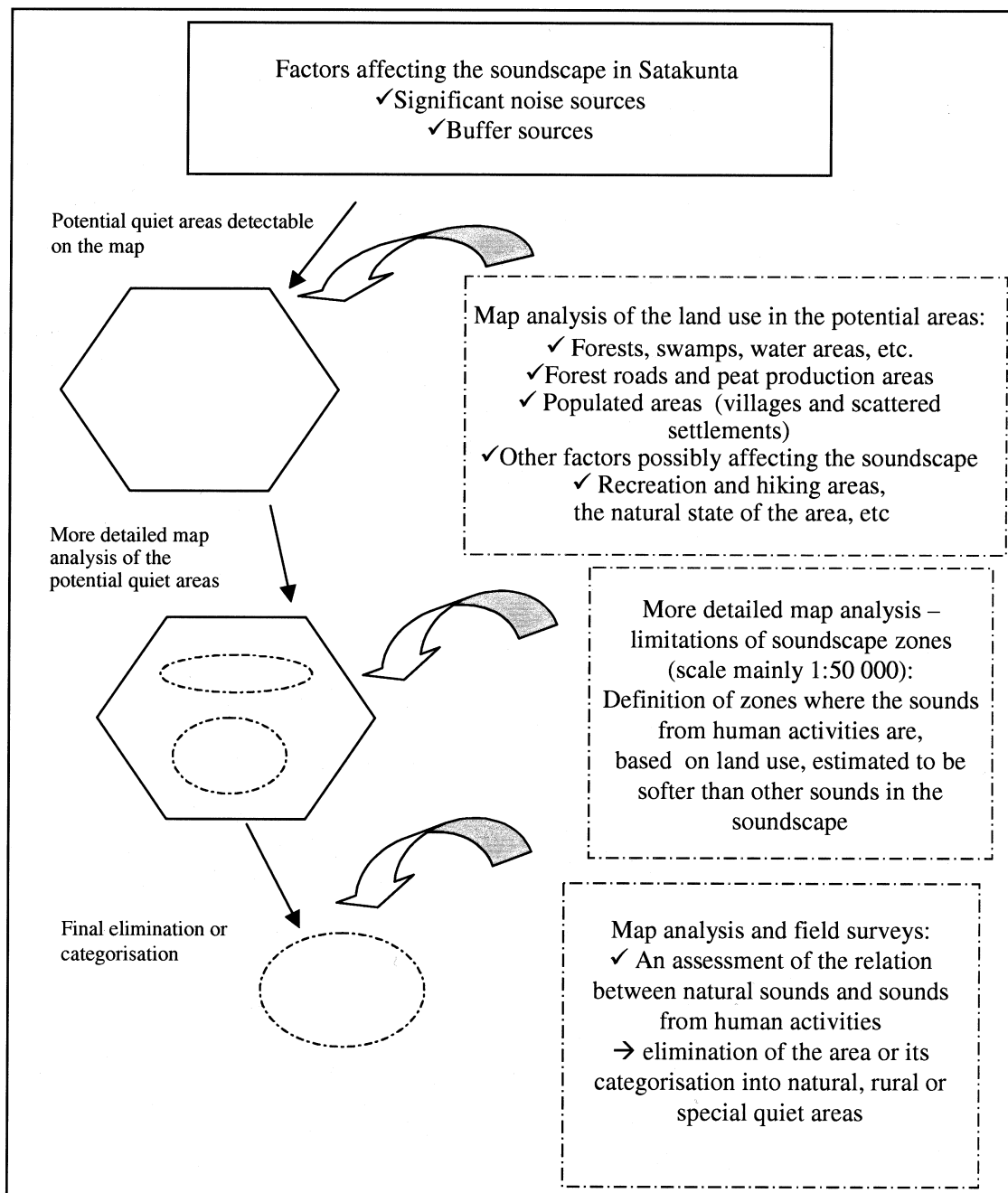





Figure 3. A more detailed description of the method of elimination used for determining natural and rural quiet areas in Satakunta.

Regionally important natural, rural and special quiet areas in the Satakunta region

The specifications presented are only relative guidelines

-  Natural quiet areas (NQA)
-  Rural quiet areas (RQA)
-  Special quiet areas (SQA)

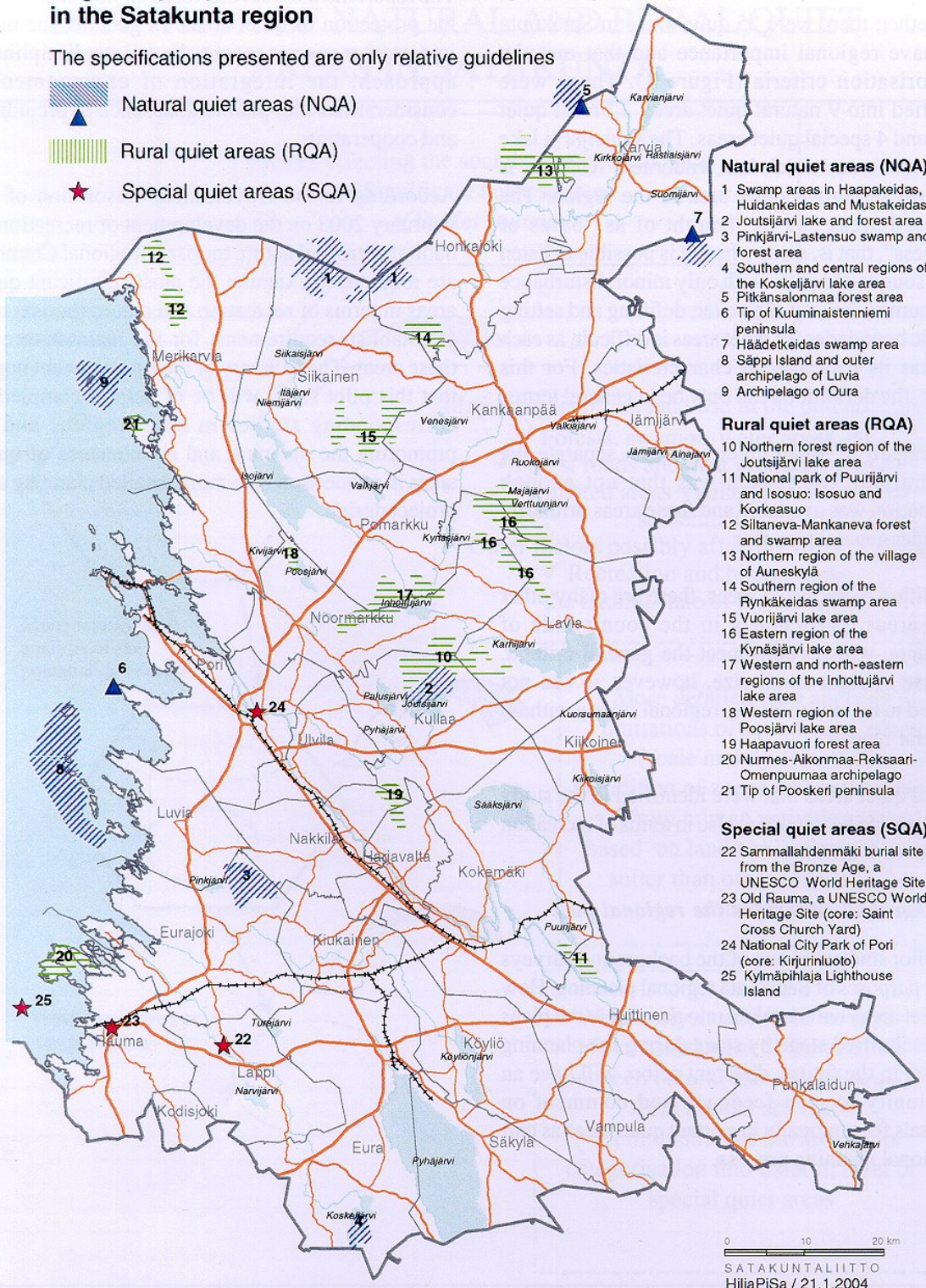


Figure 4. A proposal for natural, rural and special quiet areas in Satakunta.