

2 METHODOLOGY

2.1 Sampling and Initial Preparation

Urban areas in Sweden are defined as continuously built-up areas with no more than 200 metres between the buildings and no less than 200 residents (Sweden Statistics, 2000). By this definition there are 1 989 urban areas in Sweden. The towns and cities (hereafter these will all be called 'urban areas') with a population of more than 10 000 were chosen as a sampling population using the census of 2004 (Sweden Statistics, 2005), because all of these were thought to have a local authority large enough to have an employee that is responsible for the tree resource. Table 2.1 shows the mean population of these urban areas, and table 2.2 shows the number of urban areas situated in each of the five parts of the country as indicated in Figure 2.1.

E-mails were sent to each local authority of the sampled urban areas to ascertain contact details of the person responsible for the street and park tree resource. A database was set up with all the contact details for the sample population.

An e-mail was sent to each person for whom contact details were ascertained with a description of the study and its aims together with a plea for the person to complete the survey instrument and return it once received.

Some local authorities did not provide any contact details, but it was decided that the survey would be distributed to the local authority with a note asking them to pass it on to the person responsible for the urban tree resource.

2.2 Survey Instrument

In order to gather factual data from such a large number of local authorities, it was decided that the appropriate research instrument would have to be a postal questionnaire. The questionnaire is an often used research tool in social science to gather information on aspects of a community (Wilson and McClean, 1996).

2.3 Questionnaire Design

Since one of the aims of the study was to ascertain the state of local authority street and park tree management, the structure of the questionnaire was based on the operational definition of sustainable urban forest management as described by Johnston and Rushton (1998). This definition includes three main elements: the management has to be planned, systematic and integrated. Questions were formulated to measure these elements; other variables such as personal information, budgets and resources were also included.

The structure and many questions were identical to those of two studies into British urban forest management (Johnston and Rushton, 1999; DCLG, *unpublished*). Jenkins *et al.* (2000) has stated that when designing a questionnaire it is often useful to re-use structure and questions from previous or similar surveys, if the re-used structure/ questions have already proven successful. In this case, where the questionnaire was to be sent to Swedish local authority employees, the questionnaire was first designed in Swedish, and later translated to English. A copy of the original questionnaire and its translation may be obtained by contacting the author.

The questionnaire was structured into five sections:

- A Information about the person responsible for the tree resource
- B Budgets and Resources
- C Inventories and Strategies
- D Planning and Maintenance
- E Integrated Management

A total of 39 questions were designed in closed or open format, seeking quantitative as well as qualitative data. Even though open questions are known to take a longer time to answer (Oppenheim, 1992), these were used in order to create less bias due to limited response ranges, and to permit greater freedom of expression.

Some questions were included to gather baseline data on the tree resource, such as number of trees and the amount of money spent on various maintenance practices, so that further research can explore the trends in urban tree management. It was anticipated that data from these questions would not be included in the discussion of the more pertinent results.

A cover letter was composed that explained the aim of the study, the importance of it, that it involves the management procedures rather than practical maintenance, and that it is only embraced street and park trees, not urban woodlands. The letter also asked that the questionnaire be filled out by the person responsible for the management of street and park trees. Furthermore, the respondents were promised complete confidentiality, to ensure a more honest result.

It was decided that the respondents would be given four weeks to return the questionnaire from the date it was mailed out. This would give the respondents approximately three weeks to complete the questionnaire before the deadline.

In retrospect, the number of questions in the questionnaire could have been less, as this may have attracted more local authority employees to take the time and fill the entire questionnaire out. It is also thought that each section could have begun with some

explanatory notes about the nature of the information asked for, and the importance of ascertaining this data.

2.4 Pilot Testing

Pilot testing of the questionnaire was carried out on a small sample of local authority tree managers and other arboriculturally interested people with knowledge of the local authority system in Sweden to identify weaknesses in the content, design and format of the questionnaire. The persons involved were asked to comment on the layout and structure of the questionnaire and the cover letter, as well as the question wording and the time it would take to fill out. The pilot testing highlighted the questions which needed to be fine-tuned to suit Swedish conditions and the questionnaire was revised to include these changes.

2.5 Field Work

The questionnaire was mailed out with a pre-addressed return envelope. It is widely considered that a return envelope will have a positive influence on response rates (Hayes, 1997; Oppenheim, 1992; Wilson and McClean, 1996). The data of the returned questionnaire was coded before being entered into a spread sheet. Simultaneously, the contacts database was updated with contact information of the respondents.

When the deadline for returning the questionnaire had passed, a reminder e-mail was sent to those local authorities which had not yet responded. The e-mail reinforced the aims of the study and the importance of a high response rate, and an attachment included an electronic copy of the questionnaire. This procedure was repeated twice more during the month following the original deadline.

2.7 Statistical Analysis

Descriptive statistical analyses were carried out on all questions, and associations between variables were displayed where appropriate. Significance for the relationship between categorical variables was analysed using Chi Square test for independence.

Fig. 2.1 – Sweden divided into five part (Sweden Statistics, 2005)



Table 2.1 – Mean population of the sampled urban areas (Sweden Statistics, 2005).

Population Classes	Number of Urban Areas	Mean of Population	Total Population	Standard Error of Mean
Between 10 000 and 15 000	34	12 463.27	423 751	249.08
Between 15 001 and 20 000	19	17 242.95	327 616	301.69
Between 20 001 and 50 000	35	29 308.57	1 028 800	1 296.31
Between 50 001 and 100 000	14	70 976.43	993 670	4 058.49
Between 100 001 and 150 000	2	113 292.00	226 548	10 744.00
More than 150 000	3	652 188.33	1 956 565	288 963.29
Total	107	46 298.94	4 953 986	12 207.45

The total population of the sampled urban areas reaches slightly more than 4.9 million (Table 2.1). The total population of Sweden in December 2004 was 9 011 392 (Sweden Statistics, 2005).

Table 2.2 – Location of the sampled urban areas (for a map of Sweden see Fig. 2.1).

Population Classes	North	East	Midlands	South	West
Between 10 000 and 15 000	1	16	8	3	6
Between 15 001 and 20 000	2	6	1	4	6
Between 20 001 and 50 000	6	13	3	5	8
Between 50 001 and 100 000	1	8	1	2	2
Between 100 001 and 150 000	-	2	-	-	-
More than 150 000	-	1	-	1	1
Total	10	46	13	15	23
Percentage of total Urban Areas	9.35	42.99	12.15	7.13	28.38

The largest number of sampled urban areas is situated in the east and the west of the country, although the largest part of the country is the northern part (Table 2.2).