

## 1 INTRODUCTION

### 1.1 Population Growth and the Urban Forest

The world has experienced unprecedented urban growth in recent decades. In the year 2000, 47 percent of the world's population lived in urban areas, compared to 30 percent in 1950 (PRB, 2005). More developed nations are 76 percent urban, while 40 percent of residents of less developed countries live in urban centres (PRB, 2005). Figure 1.1 indicates the population density of the European Union. As more and more people in the world live in urbanised areas, urban planning and urban environment issues have become increasingly important. Growing concerns about natural resources has led to global actions such as Agenda 21 and Habitat recommending participating countries to develop national strategies to achieve sustainable development (Swedish Government, 2006). For development to be sustainable it must integrate environmental management, economic development and the well-being of people, and it has to involve governments, non-government organisations, the private sector, and communities as well as individuals (IISD, 2004).

Urban trees and woodlands contribute greatly to the quality of life in towns and cities. They enhance the environmental, aesthetic and wildlife value of urban areas, and create a range of recreational and educational opportunities. Urban forestry was developed as an interdisciplinary approach to planning and managing forests and trees in and near urban areas (*e.g.* Grey and Deneke, 1992; Johnston, 1997; Konijnendijk *et al.*, 2005).

The urban forest is a great resource for any town or city, and as such its management must be planned, systematic and integrated (Johnston, 1996; Johnston and Rushton, 1998). For optimal management urban trees need to be listed, categorized and monitored, and objectives and aims need to be clearly defined (Randrup, 2000). Due to the complexity of the man-made urban landscape, a wide range of expertise needs to be involved in developing and carrying out the strategies in order to achieve the aims and objectives (Bradley, 1995; Hobbs and Lambeck, 2002).

### 1.2 The Concept of Urban Forestry

The concept of urban forestry was introduced in 1965 in Canada by Jorgensen (*e.g.* Johnston, 1996; Randrup *et al.*, 2005) and was defined as dealing with tree management within the entire urban area, not only individual tree management (Grey and Deneke, 1992). However, even before this there had been pressure toward constructing such a concept, as new diseases spread through the urban tree resources and recognition came for the need of knowledge and management

systems to cope with them (Grey and Deneke, 1992). Arboriculture was developed early in the twentieth century as spatial development made tree maintenance an important issue (Miller, 1997). The International Shade Tree Conference (now the International Society of Arboriculture) was founded in 1924, as a meeting point for people interested in the care and management of trees, and was the first organisational effort for the planting and care of street trees (Grey and Deneke, 1992). In the 1970s urban forestry was recognised by the US Government through its Department of Agriculture by the establishment of a national urban forestry programme with strategies and research programmes (Johnston, 1996).

The concept of urban forestry went through several interpretations within the first few decades of its existence. Miller (1997) has defined the concept as the art, science and technology of managing urban tree resources for economic, sociological, physiological and aesthetic benefits. Brown and Pershall (1982) has suggested that only by considering the ecological complexity with factors of urban infrastructure, human population density, size of tree resource and social characteristics can the urban forest be understood.

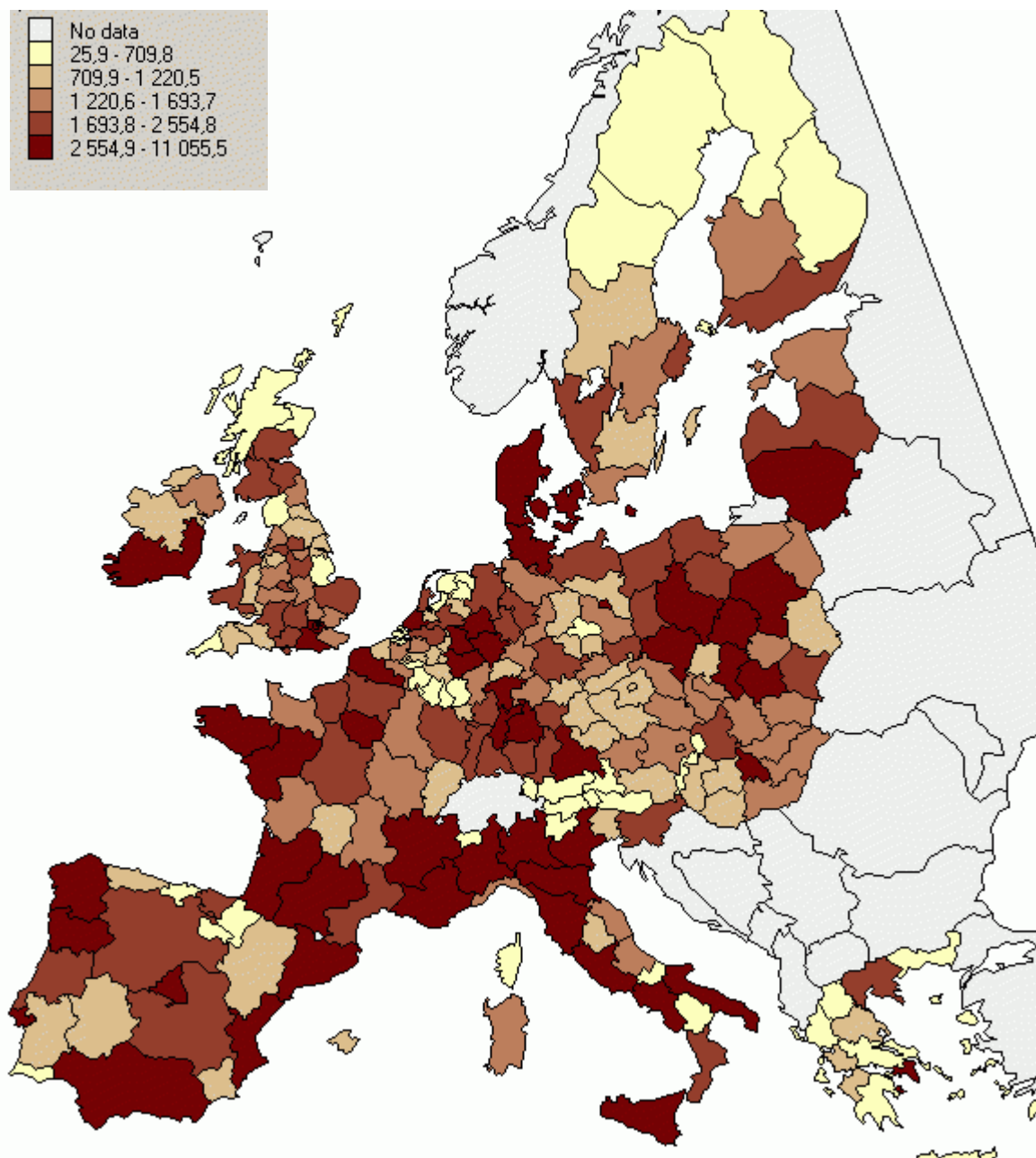
Urban forestry in Europe seems to have developed from the need of a truly integrated approach to all greenspace within the urban area, not just from concerns for individual urban trees or stands of trees. Many cities have expanded into the surrounding forests, for example the Forêt de Soignes in Brussels and Epping Forest in London (Forrest and Konijnendijk, 2005), with a clear visual connection between city centres and surrounding greenbelts.

Europe has a rich history of urban woodlands, parks, gardens and street trees and many books have been written about the history of urban planning and designed landscapes. A comprehensive history of European greenspace has been given by Hennebo (1979). Konijnendijk (1997) emphasizes the forestry and socio-economic aspects of urban forestry, whereas Forrest (2002) has emphasized the arboricultural and aesthetic aspects of the topic.

Johnston compiled an extensive overview of early British urban forestry (1997b; 1997c), and has continued to map the developments of later days (2000; 2001).

The urban forest concept reached Europe in the 1980s, the UK and the Netherlands being early followers (Randrup *et al.*, 2005). In the UK a range of projects were carried out to generate socio-economic and environmental benefits for the local communities (Johnston, 1997b).

Fig. 1.1 – Population per km<sup>2</sup> of the European Union (Sweden Statistics, 2006).



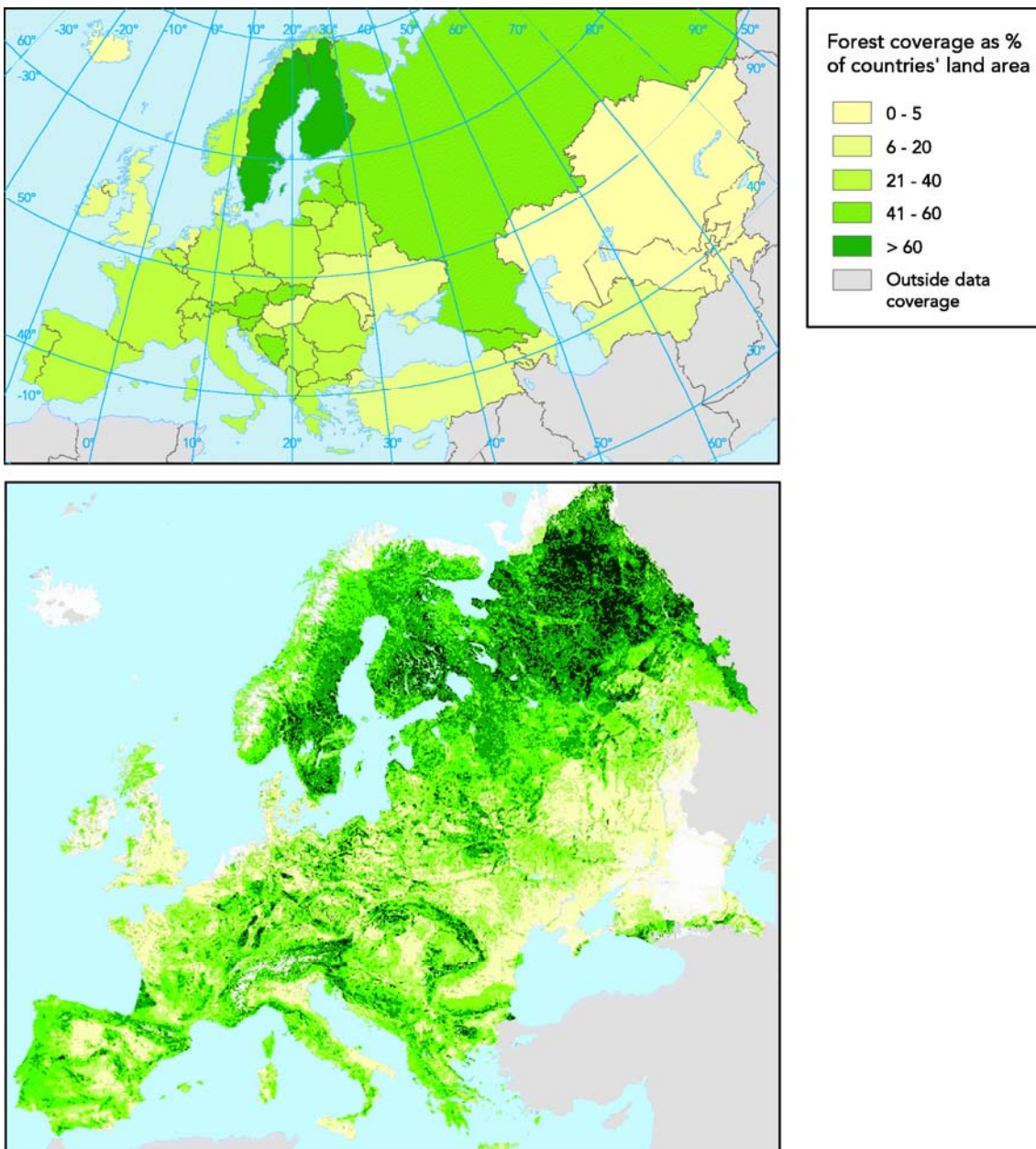
Randrup *et al.* (2005) provides a framework for defining urban forestry that is based on the definitions used in fourteen European countries. The framework shows that although the definition of urban forestry varies between countries, key elements, such as the integrative, strategic and multidisciplinary approach and the multiple benefit provision, are agreed upon.

In Sweden, a country where 60 percent of the total land area consists of woods and forests (Earthtrends, 2000), a large part of the population does not have to go far to experience nature. Towns and cities have developed

out of a wooded landscape, and there is often a large amount of undeveloped woodland within urban areas (Nilsson and Vollbrecht, 1992). This is unique in a world where the city green generally consists of planted parks and stands of trees. Figure 1.2 shows forest cover of Scandinavia and other European and semi-European countries.

Urban forestry is at a relatively early stage of development in Sweden, although there is a long history of green space planning (*e.g.* Bucht, 1997; Edman, 2001). Planting and preservation of vegetation in parks, streets and private gardens were employed in

**Fig. 1.2 – Forest cover of Europe and parts of Eur-Asia (FAO, 2000).**



late stages of industrialisation to make cities healthier and safer (Berglund, 2005), much as it was in the rest of Europe in the late nineteenth century (Miller, 1997). Ideas from England inspired much of the Swedish landscape architecture of the nineteenth century, ideas of wide avenues lined with leafy trees, parks with large fountains and social recreation for the working class (Bucht, 1997). Street trees were planted more often from mid-nineteenth century as streets were widened to protect buildings from fires (Berntsson, 2002), a concept taken from Napoleon III's boulevard project in Paris (Granbom *et al.*, 1994). Government planning guidance from this time recommends street tree

planting as a means of separating traffic lanes and tram railways from pedestrian areas (Linn, 1985).

Urbanisation from 1900 and onwards has led to an aggregation of 84 percent of the population into an area of about one percent of the total land area of Sweden (Sweden Statistics, 2005b). For these people an important part of city life has been the 'recreational wood', a concept widely recognised in Scandinavia (Falck and Rydtberg, 2001; Florgård, 2001; Konijnendijk *et al.*, 2005). These woods may exist within the urban area, but are most common on the urban fringe. From the 1950s and onward these woods

have been managed by people with roots in forestry, but also in landscape architecture and ecology, and the commonly known definition of ‘urban forestry’ describes the management of these woods (Falck and Rydberg, 2001). Therefore it is not surprising that street trees have traditionally been managed by foresters and parks attendants, and the job title ‘Arborist’ has yet to become widely recognised.

With rising concern for the quality of life in urban areas have come stricter regulations on building and development (Swedish Government, 1997), and environmental issues are understood to be related to the physical, social and economic well-being of an urban population (Falck and Rydberg, 2001). The legal framework for trees consists mainly of the Planning and Building Act (MSD, 1987) which concerns the planning of land and water use and regulates tree felling; the Property Act (JD, 1970) which concerns, for example, damage to property such as trees, and the Environment Act (MD, 1998) which aims to promote sustainable development and preserve biodiversity.

Randrup *et al.* (2005) provide the Swedish definition of the urban forestry concept. Objectives include planning, design, landscaping, care, maintenance and cultivation. Single trees, woodlands, forests and ecosystems within and around cities (but not towns/villages) and close to urban areas make up the urban forest, and benefits are said to be mostly social with aesthetic and recreational values.

### 1.3 Related Studies

The following sections will examine major surveys that have been carried out to present a picture of the urban forest resource and the extent to which an integrated, systematic and planned approach to management is implemented.

#### North America

In 1986 Jim Kielbaso and co-workers at Michigan State University conducted a survey of municipal tree care in the United States (Kielbaso *et al.*, 1987). The research project was based on surveys of tree care management programmes and tree resources carried out in 1974 and 1980, and aimed at determining the updated status of municipal tree care. Primary focus was on broadening the base of existing national changes and trends in the municipal tree care management. A comprehensive questionnaire was sent to 2 787 municipalities (the term municipality refers to cities, towns, townships, villages and boroughs). The questions range from geographical information and tree numbers to manpower, budgets and tree work equipment. It is clear that this research project was aiming at broadening the knowledge of existing programmes, and the fact that this survey was based on

previous surveys makes the form of the project legitimate. As baseline data the scope of this survey would have been too in-depth. Interestingly, the questionnaire contains no questions regarding integration with organisations outside the municipality or the public, even though the report of the project stresses the importance of public involvement (Kielbaso *et al.*, 1987).

An equally ambitious survey was conducted in 1999 by Dwyer *et al.* (2000) as a first national assessment of urban forest resources, and it details variations in urbanisation and urban tree cover across the US by state, county and individual urban area. Such data is truly important as it may illustrate how tree resources change through time in response to a number of forces, and as it will facilitate comprehensive resource management. The study was carried out by enacting the Forest and Rangeland Renewable Resources Planning Act: 1974, which calls for the Forest Service to produce an assessment of renewable resources within the nation and also develop an action programme that respond to the future areas of emphasis mentioned in the assessment. Such an approach must surely be very efficient in providing a solid knowledge base for large-scale planning activities. The result is an impressive assessment of urban tree resources, policies and programs, and the report presents valuable ideas for topics to be examined in future investigations, as well as an in-depth analysis of the current state of the nation’s urban forest resources.

#### Europe

Forrest *et al.* (1999) carried out an overview of research in Europe within the framework of the pan-European research network COST Action E12 “Urban Forests and Trees”, where national experts involved in the network were asked to prepare reports on recent and on-going research on urban forests and trees in their respective countries. The report presents a good indicative overview of research efforts in Europe and shows bias toward research on establishment issues and public perception surveys. However, a few surveys regarding urban forestry policies and programmes have been carried out, and the relevant ones will be analysed here.

Cecil Konijnendijk (1997) has carried out a comparative study of urban forestry in selected major European cities, where focus was on conservation, management and development. The study showed major similarities in urban forest situations and Konijnendijk provides suggestions for innovations and developments which may prove valuable for Europe’s urban forest managers. The study was unfortunately not comprehensive as quite a few countries were missing, such as for example United Kingdom, Norway, Sweden, France and Spain. However, the study provides useful information for further

comparative research and could enhance access to various sources whether it relates to policy-making, research or practice.

Shmied and Pillman (2003) carried out a survey of regulations and legal requirements concerning tree protection in Europe, based on questionnaires, but also on legal acts, ordinances and regulations. The information mainly concerns mainland Europe, perhaps due to available contacts and language barriers, and consequently neither the UK nor Scandinavia were participating in the survey. For comparative studies this survey provides only basic facts on urban tree protection, although the discussion presents useful ideas on the elements of tree legislation.

Strangely absent from pan-European research, the UK holds its own when it comes to urban forest management studies. Several valuable surveys have been conducted during the past thirteen years. In 1993, Land Use Consultants was commissioned by the Department of the Environment to conduct a survey of urban tree resource numbers and condition and their management in 66 towns and villages in England (LUC, 1993). The information gathered illustrated a general absence of any coherent strategy for the tree resource and the forecast put forth in the report seemed negative. The conclusions drawn in this report rely on merely 66 towns, which is not thought to give a complete picture. However, in concentrating on only a few cities it may be possible to look more in-depth into issues of concern.

In 1997 Mark Johnston and Brian Rushton conducted a survey of urban forestry in Britain (1999) with the aim to measure the extent to which urban tree management policies and strategies were employed and developed within local authorities (Johnston and Rushton 1998). A first of its kind in the UK, the survey produced baseline data from which progress may be measured, and such a source of information may be used in developing nationally recognised standards for local authorities to work towards. Although based on Kielbaso's work, Johnston and Rushton's survey was more focused and stayed fixed on the three chosen indicators: the planned, the systematic and the integrated management. This is a necessary approach if the long-term goal is to establish some sort of national standard for organisational management.

In 2004 the follow-up to *Trees in Towns* was commissioned by the Office of the Deputy Prime Minister, now the Department for Communities and Local Government (DCLG). Myerscough College and ADAS were to conduct a major research study of England's urban forests, and the results will help shape central and local government policy on urban trees (DCLG, *unpublished*). As the most ambitious project to date, this survey of *all* English local authorities will indisputably produce some interesting figures. Just as

Johnston and Rushton's work (1999), this survey focuses on planned, systematic and integrated management, but has an added part on tree legislation, which is an important element of any urban tree policy.

As for Scandinavia, research within urban forestry has been aimed particularly at four areas:

- 1) Functions of urban forests, and social and environmental values;
- 2) Plant selection programmes;
- 3) Establishment techniques, and;
- 4) Management practice planning and management techniques (Gustavsson *et al.*, 2000).

Surveys have mainly been concerned with public perceptions and attitudes towards urban forests (*e.g.* Lundquist, 2005; Berglund, 2005; Tyrväinen, 2001), but also with the economy of parks and the urban forest (*e.g.* Hansson, 1989; Tyrväinen, 1999). In Sweden, a survey of interest is a questionnaire sent out to LAs regarding street trees planted in or close to hard surfaces between 1981 and 1991 (Bengtsson and Lindberg, 1994). Although the report focused on planted tree species, the total number of trees may give an indication of the Swedish publicly owned urban forest.

#### 1.4 Aim of the Study

No previous research has sought to broaden the knowledge of current local authority urban tree management in Sweden or Scandinavia, even though much literature and research point to the importance of trees to city dwellers (*e.g.* Linn, 1985; Falck and Rydberg, 2001; Konijnendijk *et al.*, 2005). Having spent the past three years as a foreigner in a country (the UK) where urban tree cover is rigorously regulated through planning law due to the over-population of the land, the author wonders how a country like Sweden, where so much of the land *outside* the towns and cities is covered by trees, handles the publicly owned individual trees *within* the urban areas. Therefore, the aims of this study were as follows:

- Provide a picture of the state of the management of publicly owned street and park trees in Sweden;
- examine the background and qualifications of the persons responsible for the management and their budgets;
- ascertain the extent to which local authorities take a planned, systematic and integrated approach to the management of their urban tree resource, and;
- provide baseline data for use in further research.