The Urban Forestry Resource in Europe

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Definitions

American Society of Foresters:
the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society’.

FAO: Urban & Urban Periphery Forest (UPF)

urban and peri-urban forest and other wooded land, as well as trees in parks, gardens, tree-lined streets and squares, undeveloped areas, transport and river corridors.
London urban forester:

‘trees where there are people’.
Three main types of location for UPF

- Trees in streets, squares, parking areas and other “grey spaces” with sealed surfaces.

- Trees in parks and other green spaces such as yards, gardens, and commercial areas.

- Stands of trees that are often referred to as “woodlands” or “woods”.

Randrup et al., 2005
Street (Note sealed surfaces)
Street Trees

- Soil compaction.
- Soil quality
- Drought.
- Low soil rooting volume causing chronic water and nutrient stress.
- Particulate and atmospheric pollution
- Soil disturbance and root damage from utilities.
- Physical damage from vehicles and other causes.
- Health and safety
Park (Note permeable surfaces)
Trees in Parks

- Soil compaction.
- Soil quality
- Atmospheric
- Drought
- Health and Safety
Woodland
Woodlands

- Compaction
- Soil quality
- Fire & Vandalism
- Atmospheric
- Water, especially in early stages.
- ‘Normal’ damaging factors – animals, pathogens.
Trees in different sites face different circumstances and deliver different objectives:

- levels of planning and management hierarchy required
- stress experienced
- establishment techniques used
- average life times
- establishment and management costs.

Nilsson et al. (2001)
Inner-city recreational river landscape based on returning developed areas to a green and more natural state.

Objectives
- Improve flood protection;
- Increase of the naturalness of the river landscape;
- Restore ecological functions;
- Enhance the Isar riverbank bank for leisure and recreation by the urban population;
- Improve water quality;
- Increase residual flow.

Description
Within the urban area of Munich, a 6 km length of the river Isar was substantially restructured and recovered for nature-oriented leisure and recreation.
What do we Know About the Resource? - Forest Inventories

- Numerous local and regional studies,
- National Forest Inventories (NFIs) do not report on UPF separately,
- Urban Woodland is categorised in some NFIs,
- But other elements of UPF are not categorised.
- It is not possible to form an understanding of the UPF resource from current data collected in NFIs.
- Small changes should make this possible.
- ICT makes data collection more achievable.
Forest Inventories

- Commonly sample only those areas that exceed a specific minimum size and carry species that have a minimum height (usually 5m) when mature.
- The most commonly approach is that of the United Nations Economic Commission for Europe/FAO (UNECE/FAO, 1997)
- ‘Forest land’ exceeds 0.5 ha in extent with a canopy cover of at least 10% of species exceeding 5m on maturity.
- ‘Other land’ is categorised as 0.5 ha minimum area, 5 – 10% crown cover of tree species or at least 10% shrub coverage.
Data on the Resource – Greenspace Inventories

- Greenspace does not categorise UPF as a separate category,
- Often map-based with satellite imagery used to confirm sample data.
- Cannot be used as a proxy for UPF,
- Could minor changes be made to change this?
Data on the Resource: Plant Health Inventories

- UPF is not covered in national forest health surveys.
- National responsibility for horticultural plant health not always clear – UPF species likely to be omitted.
- Global trade in plants, including soil, presents a significant risk of transferring plant pests and diseases.
- UPF Species probably average about 50% from outside the area so unlikely to have disease resistance.
- Low levels of genetic diversity – cloning, varietal concentration – likely to increase the chance of catastrophic incidences.
- This is not hypothetical, it is happening now.
The Example of Horse Chestnut Disease in the UK and Europe

• UK horse chestnuts have suffered increased levels of attack from the horse chestnut leaf miner, *Cameraria ohridella*, and from a fungal pathogen causing stem bleeding, commonly known as bleeding canker.

• The Horse Chestnut Leaf Miner was first observed in Macedonia in northern Greece in the late 1970's. In 1989, it appeared unexpectedly in Austria and has since spread throughout central and eastern Europe. It is currently spreading west through France and south through Italy.

• *C. ohridella* was first found established in the UK in the London Borough of Wimbledon in July 2002. From this initial area of infestation, the moth has spread rapidly, and it is now present across most of south-central England, East Anglia and the Midlands. Together the two pathogens have been associated with bleeding cankers.

• Netherlands, Belgium, France and Germany are also experiencing a similar upsurge in bleeding cankers in Horse Chestnut.

• A completely different pathogen, *Pseudomonas syringae pv aesculi*, has now been found to be responsible for the increase in these symptoms appearing on horse chestnut.

Forest Research 2010
People care about their trees!

janet quinn
24 June, 2010
All trees in our local park seem to be affected by leaf minor in a huge way. Baby conkers are falling and leaves look pale with blotches – but all of them. Have reported to parish council who hopefully will take it forward.

Chris
30 June, 2010
This might interest http://www.sylva.org.uk/treewatch/about.php

Anni
30 July, 2010
I have 3 horsechestnut trees behind my property whihc have been like this for sometime. My garden is full of leaves and also some of my shrubs are now covered with these moths. I have contacted my local Council Cotswold District Council, but am still awaiting a reply!

MALCOLM
6 August, 2010
THE HORSE CHESTNUTS IN BEAUTIFUL CARY PARK IN BABBA COMBE SOUTH DEVON, HAVE NOW FALLEN PRAY TO THIS BLIGHT WITH SMALL CONKERS FALLING AND LEAVES UNDER ATTACK TURNING BROWN.

Nick
10 August, 2010
Went to Anglesey abbey gardens (NATIONAL TRUST) 9/08/2010 and the horse chestnut trees are in a very poor state with this disease, I was told the NT are to cut down all of the trees in the gardens (these number about 100 plus). Else where in Norfolk, I have seen tree after tree with brown leaves and the canker.
Factors contributing to the lack of data

- Different levels of planning and management,
- A wide variety of agencies and owner structures,
- UPF is at present largely overlooked in international forestry processes,
- National forest programmes in Europe, which share a common root in the UNCED 1992 Proposals for Action, make little or no mention of UPF
- Definitions, terminology and the practices used in national forest inventories are not yet adapted to meet the information needs of urban forestry,
- The lack of empirical data at a scale larger than city or city-region extends not only to inventory but also to the products and services delivered by UPF.
Why does a lack of data matter?

- Strategic Planning
- Urban planning and design
- Management Plans & objectives
- Comparative land-use decision-making
- Valuation
- Competition with other interests.
Current Progress & Opportunities to Collaborate

- IUFRO’s Urban Forestry research group is currently developing [Urban Forestry Data Standards](#).
- The FAO Global Forest Resources Assessment (FRA) 2010 is preparing a thematic report on Trees Outside Forests (TOF) – due in August.
- EEA’s CORINE land-cover data has a ‘green urban’ category that provides useful information, especially on designations, but not at the level (1:100,000) of detail or with the categories required.
- *Trees in Towns 2* in the UK is a possible model.
- Software-based management & valuation systems, especially in the USA.
Geographical Differences

Percentage of green urban areas in core cities:

- 0–10
- 10–20
- 20–30
- 30–40
- 40–50
- 50–60
- 60–70
- 70–80

No data
Outside data coverage

Source: EEA, 2010
Green areas as % of total city area

Green areas as a percentage of total municipal areas

Source: Bono et al., 2006 (Urban Ecosystem Europe)
Plant health risks

- We don’t know how much of the UPF resource is local or exotic. (Data from USA indicates 50% local).
- We don’t know enough about genetic diversity – it is certain to be lower than natural populations.
- There is a demonstrable risk of catastrophic pests and diseases:
  - Damaging UPF Species and
  - Spreading from UPF to commercial forestry species
- Climate change adds a further layer of uncertainty;
  - Increased stress in potential hosts leading to increased susceptibility,
  - Pest and pathogens increasing their range as the climate changes
Red Needle Blight on *Pinus* spp. that is making the future of English pine forests very uncertain.

Phytophthora spreading from Rhododendron to *Quercus robur* & *Q. petraea* and most recently to *Larix* spp. This has led to a complete halt to planting *Larix* in the UK.
The Profession

- Urban forestry practice in Europe is highly advanced.
- Trees and woodlands can be established on the most difficult sites and managed to meet a wide range of purposes.
- The skills to deliver these complex objectives are readily available.
However:

• Data collection and inventory systems in the component disciplines has not kept pace.

• There has been little integration of data collection and inventory systems across disciplines and across organisations at different levels, from the local to the national.

• There are unquantified risks, especially to do with biosecurity.
Evidence & Research Needs

- Inventory – standards and definitions
- Data collection
- Valuation
- Hazards and risk management
- Knowledge transfer across disciplines.