

APSE Fleet, Waste and Grounds services seminar  
2013

# A vision for the Future



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City of Edinburgh Council  
Forestry Service

# Tree Inspections!

Steven Webley  
Forestry Manager

Parks and Greenspace

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## Parks and Greenspace

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- Understanding the risks from trees
- The tree inspection process
- Key Lessons

# Understanding the risks from trees

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# Peter Pan Syndrome



<http://www.dragoart.com>

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# Worlds Most Dangerous Jobs

1. Deep Sea Fishing
2. Fire fighters
3. Bomb Disposal Afghanistan
4. Security Guard Middle East
5. Test pilots
6. Police Officers
7. Forestry workers

# Why manage trees?

- Accepted and established practice
- Duty of Care
- Health & Safety liability
- Safely maintain amenity & conservation benefits
- Allows a planned, risk assessed approach
- Prioritised programme and budget for remedial tree work



## Duty of Care: -

- Occupiers Liability (Scotland) Act 1960
- Health & Safety at Work Act etc 1974, section 3 (1)
- Land Reform (Scotland) Act 2003
- Roads (Scotland) Act 1984
- Town and Country Planning (Scotland) Act 1997
- Wildlife & Countryside Act 1981
- Nature Conservation (Scotland) Act 2004

# NTSG Guidance

NATIONAL TREE SAFETY GROUP

## Common sense risk management of trees

Guidance on trees and public safety in the UK  
for owners, managers and advisers

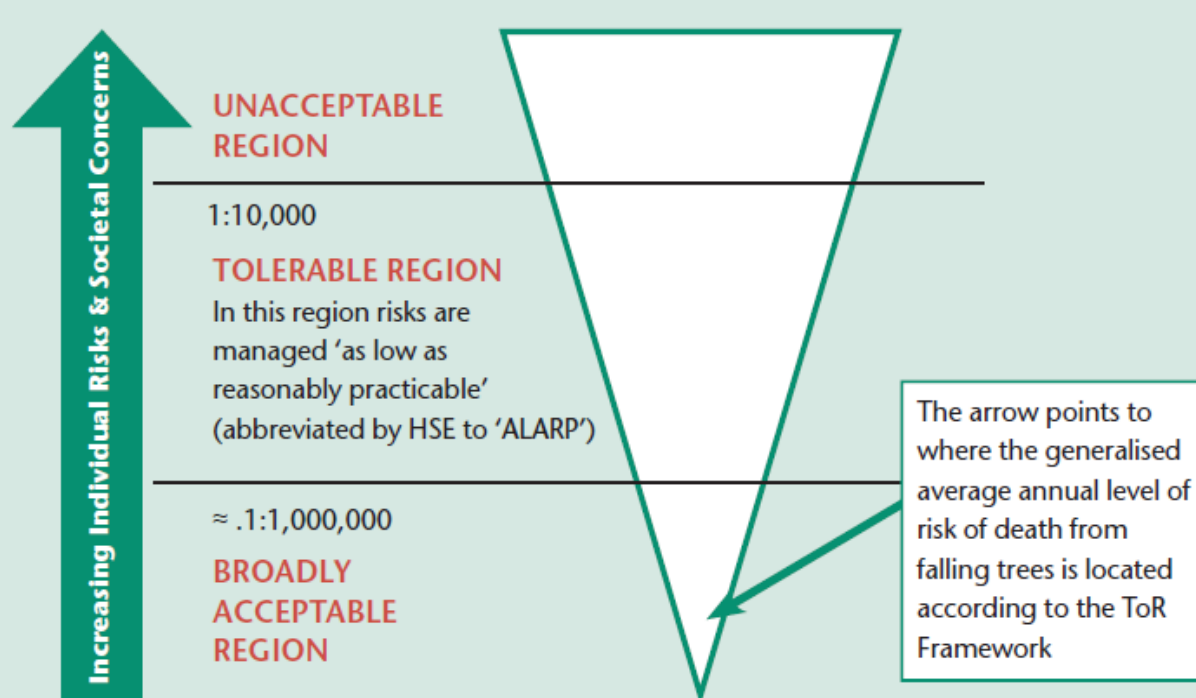
NTSG

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# National Tree Safety Group

**Figure 2. Tolerability of Risk Framework<sup>1</sup> (ToR)**

Visual presentation of the level of general annual risks of death from falling trees – note the 'tolerable region' is where risks are managed as low as reasonably practicable ('ALARP')



<sup>1</sup> The diagram is based on *Reducing risks, protecting people* (HSE 2001) Figure 1: 'HSE framework for the tolerability of risk'.

# National Tree Safety Group

**Table 1. Annual risk of death from various causes over entire population**

Cause of death	Annual risk	Basis of risk and source
Cancer	1 in 387	England and Wales 1999
Injury and poisoning	1 in 3,137	UK 1999
All types of accidents and other external causes	1 in 4,064	UK 1999
All forms of road accident	1 in 16,800	UK 1999
Lung cancer from radon in dwellings	1 in 29,000	England 1996
Gas incident (fire, explosion or carbon monoxide poisoning)	1 in 1,510,000	GB 1994/95–1998/99
From trees	1 in 10,000,000 or less if high wind incidents are excluded	This study
From lightning	1 in 18,700,000	England and Wales 1995–99

64 deaths during the 10 years after 1 January 1999.

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# Birmingham December 1999



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# Judgement: July 2002

- Kenneth Davis, his mother Ellen, and Alan Poole were all killed when the ash tree fell on their cars in King's Heath in December 1999 amid gale force winds.
- The council pleaded guilty to the charge brought by the Health and Safety Executive (HSE).
- Judge Richard Wakerley QC said: "The condition and the danger the tree presented would have been obvious to anyone making a close inspection of that tree."

## Precedent case law: -

- Noble v. Harrison, 1926
- Cunliffe v. Bankes, 1945
- Kent v Marquis of Bristol, 1947
- Chapman v Barking & Dagenham London Borough Council, 1997
- **Birmingham City Council, 2001**
- **Poll v. Viscount Asquith & other, 2006**

Barrell Tree Consultancy Case law resource



# HSE Guidance: -

- Management of Risk from Falling Trees (SIM 01/2007/05), 2007.
- Nature of Risk – severity vs probability
- Fatality or serious injury – “a background risk”
- Duty of Care – doing all that is “**reasonably practicable**”

# HSE Guidance: -

- Individual tree reports
  - with potentially serious structural faults,
  - posing a potentially serious risk to public safety,
  - where the tree is to be retained
  - "where a tree has been identified as having a structural fault that presents an elevated risk, action should be taken to manage the risk."

# The standard of Inspection

The courts have not defined the standard of inspection more precisely than the standard of “the reasonable and prudent landowner”.

- It has been recognised that this test sounds simpler than it really is: “it postulates some degree of knowledge on the part of landowners which must necessarily fall short of the knowledge possessed by scientific arboriculturists but which must surely be greater than the knowledge possessed by the ordinary urban observer of trees or even of the countryman not practically concerned with their care”.

# Tree Officer – “Competent person”

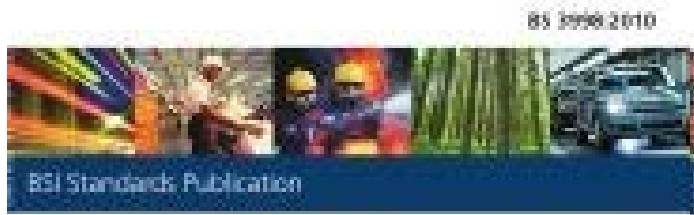
- Training – diploma, degree, professionally qualified
- Work experience – have detailed working and relevant knowledge of trees
- Competence – acting within limit of technical training and work experience
- “Level 2”

# Council's liability

- Survey its trees
- Have this done by a competent person
- Take reasonable action

# The tree inspection process

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Tree work – Recommendations

# BS 3998:2010 Tree work. Recommendations



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BS 5837:2012



BSI Standards Publication

**Trees in relation to design,  
demolition and construction  
– Recommendations**

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**BS 5837:2012 Trees in  
relation to design,  
demolition and  
construction.  
Recommendations**

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# Natrional Joint Utilities Group

- **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in**

**Proximity to Trees  
Volume 4**

**NJUG GUIDELINES FOR THE  
PLANNING, INSTALLATION AND MAINTENANCE OF  
UTILITY APPARATUS IN PROXIMITY TO TREES**

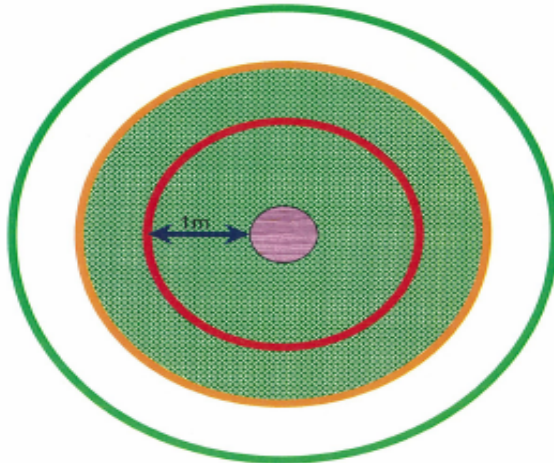
**Parks and Greenspace**



The National Joint Utilities Group

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees – Issue 2

# National Joint Utilities Group



TREE PROTECTION ZONE

## Key to Diagram



Trunk of Tree



Spread of canopy or branches



**PROHIBITED ZONE – 1m from trunk.** Excavations of any kind must not be undertaken within this zone unless full consultation with Local Authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



**PRECAUTIONARY ZONE – 4 x tree circumference.** Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with Local Authority Tree Officer if in any doubt.



**PERMITTED ZONE – outside of precautionary zone.** Excavation works may be undertaken within this zone however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

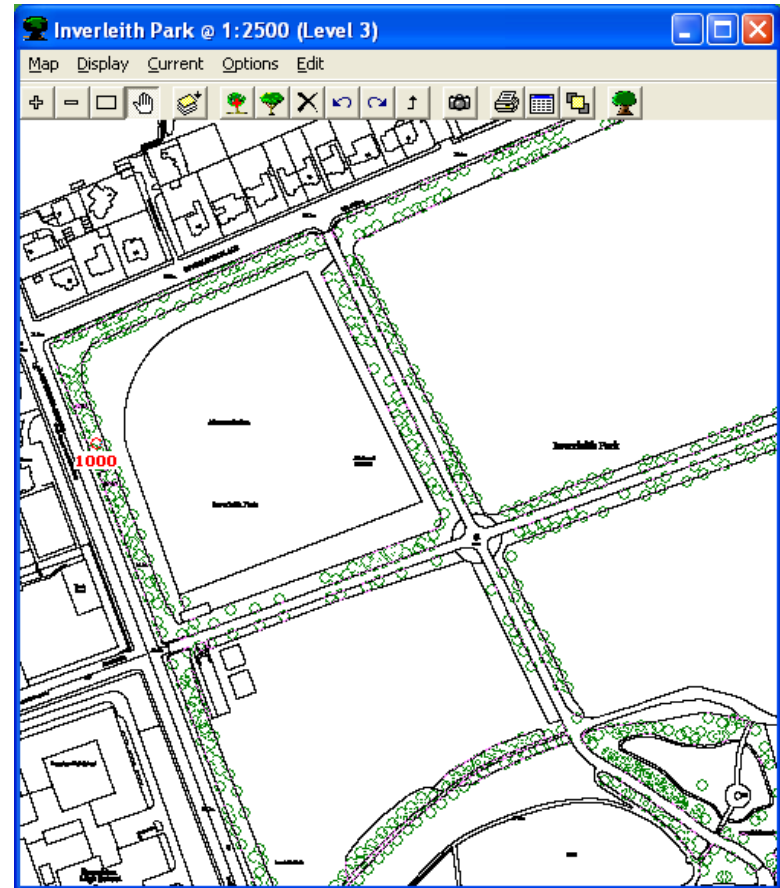




## Utilities trenching works Clermiston Edinburgh

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# Visual Tree Assessment



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# Prof. Dr. Claus Mattheck



<http://www.mattheck.de/english/english2.htm>

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CLAUS MATTHECK:

# STURSI

EXPLAINS THE TREE



A HEDGEHOG TEACHES THE BODY LANGUAGE OF TREES

3RD ENLARGED EDITION

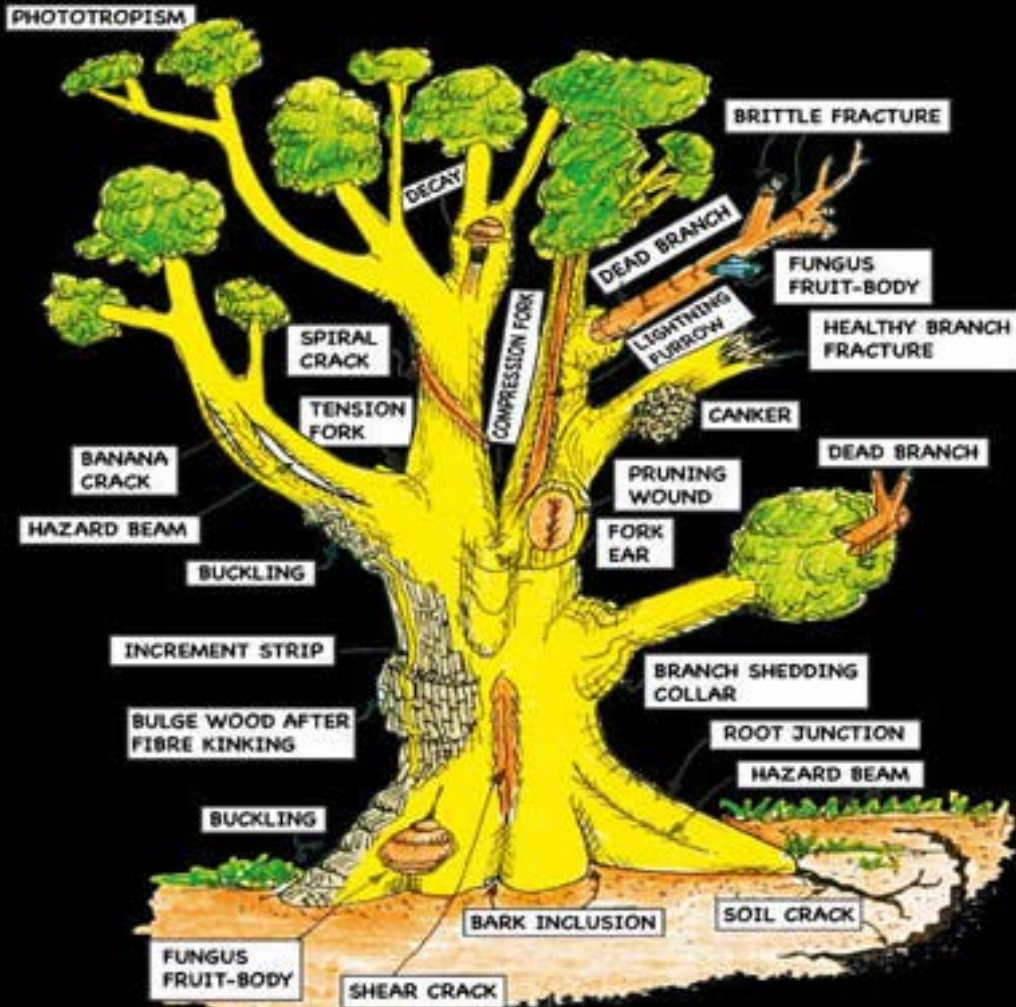
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C. Mattheck

Updated

# Field Guide



for Visual Tree Assessment

Prof. Dr. Claus Mattheck

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# Objectives of Edinburgh Tree Survey: -

- Bring under active management parks, gardens and woodlands
- Locate trees, assess condition, decide remedial action, cost and priority of remedial work and subsequent inspection.
- Outputs – GIS map, list of trees, report, supporting information, determine budget's, create programme of work.

Total trees presently recorded on Edinburgh's Ezytreev database.

Ezytreev Tree Management System

Tree selection level 1 - 47745 trees selected - All trees

Trees Find EzyMaps Select Global Export Maintenance Exit

Tree type/code (*)	R	Site	Tree Seq			Site	Location	Visited
Sgl/000208	-		3.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000212	-		4.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000216	-		5.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000220	-		6.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000224	-		7.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000228	-		8.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000232	-		9.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	City Centre
Sgl/000236	-		10.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000240	-		11.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000244	-		12.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000248	-		13.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000252	-		14.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000256	-		15.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000260			16.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000264			17.00	\$9954 & Os	Tilia x europaea	Albert Street	Albert Street, Edinburgh	Leith Walk
Sgl/000274		DE0013	19.02	Un-plotted	Ulmus glabra	Cramond yachting Club house	River Almond Walkway	Unallocated..
Sgl/000276		DE0013	19.04	Un-plotted	Ulmus glabra	Cramond yachting Club house	River Almond Walkway	Unallocated..
Sgl/000280		DE0013	20.00	\$5145 & Os	Acer pseudoplatanus	b20171	River Almond Walkway	Almond
Sgl/000284		DE0013	21.00	\$5145 & Os	Acer pseudoplatanus	b20172	River Almond Walkway	Almond
Sgl/000288		DE0013	22.00	\$5145 & Os	Fraxinus excelsior	b20173	River Almond Walkway	Almond
Sgl/000296		DE0013	24.00	\$5145 & Os	Acer pseudoplatanus	no tag	River Almond Walkway	Almond
Sgl/000300		DE0013	25.00	\$5145 & Os	Acer pseudoplatanus	no tag	River Almond Walkway	Almond
Sgl/000304		DE0013	26.00	\$5145 & Os	Fraxinus excelsior	no tag	River Almond Walkway	Almond
Sgl/000308		DE0013	27.00	\$5145 & Os	Acer pseudoplatanus	no tag	River Almond Walkway	Almond
Sgl/000312		DE0013	28.00	\$5145 & Os	Fraxinus excelsior	no tag	River Almond Walkway	Almond
Sgl/000316		DE0013	29.00	\$5145 & Os	Acer pseudoplatanus	no tag	River Almond Walkway	Almond
Sgl/000320		DE0013	30.00	\$5145 & Os	Acer pseudoplatanus	no tag	River Almond Walkway	Almond
Sgl/000324		DE0013	31.00	\$5145 & Os	Acer pseudoplatanus	b20178	River Almond Walkway	Almond
Sgl/000328		DE0013	32.00	\$5145 & Os	Acer pseudoplatanus	b20177	River Almond Walkway	Almond
Sgl/000332		DE0013	33.00	\$5145 & Os	Acer pseudoplatanus	b20175	River Almond Walkway	Almond
Sgl/000336		DE0013	34.00	\$5145 & Os	Acer pseudoplatanus	b20176	River Almond Walkway	Almond

Table: E0110038 (1/47745)

Tree Codes  
Enquiries  
Rates  
Tree-works  
Budgets  
On-site  
O/s Mapping  
Overlays  
Maintenance  
System  
Support

Trees

General tree select & display

Via selected Location

Via selected Location/Site/Type

Via street gazetteer

Featuring on selected O/s map

Plotted on selected map

Maintain & display tree sets

General tree

Tree

- Enquiries
- Rates
- Tree-works
- Budgets
- On-site
- O/s Mapping
- Overlays
- Maintenance
- System
- Support

Tree selection level 2 - 190 trees selected - Via site

Tree type/code (*)	R	Site
Sgl/092216		DE0107
Sgl/092220		DE0107
Sgl/092224		DE0107
Sgl/092228		DE0107
Sgl/092256		DE0107
Sgl/092260 *		DE0107
Sgl/092264		DE0107
Sgl/092268 *		DE0107
Sgl/092272		DE0107
Sgl/092276		DE0107
Sgl/092280		DE0107
Sgl/092284		DE0107
Sgl/092288		DE0107
Sgl/092292		DE0107
Sgl/092296		DE0107
Sgl/092300		DE0107
Sgl/092304		DE0107
Sgl/092312		DE0107
Sgl/092320		DE0107

### Tree/inspection details

Type: Single tree Location: b18263

Code: 092256

Site: Bruntsfield Links West

Locn: Meadows/Morningside

Seq: 115.00

Rte:

Species: UGEXD Ulmus glabra 'Exoniensis' (Exeter elm) Was

Plotted: Plotted on \$5332 No of trees: 1 Planted:

O/s ref: NT27-4973-2137 Stock type:

Owner: Common Good Value: Not valued

Contract:

Tree Group Info Add Attachments Add Notes

Inspection/Visit Details

Status: Last visit. Visited: 08/03/2012 at 14:32 by IM for Tree Inspection

Height: 15-20 meters

Spread: 12+ meters

Trunk: 60-70 cm

Age: EM years

Features: FP,PH,RD

Condition: BSTMI,BTRM,MDMOD

Recommend: RTSS

Tree-Works: None recorded.

Priority: Desirable Add Comments

Risk Assessment

Risk Factor: Hazard 1

Category: Low priority

Site visit history

Tree works history

Tree Enquiries

Condition: Good

FailurePo:

Size of P:

Target R: Occ use/moving

Target:

Visits: Inspect Amend Delete

Select: Prev Next Curr Next: 03 2017 Ok

The owner category states what council department owns the land, or alternatively if it is common good and privately owned land.

Tree tag number is entered under location (the starting letter b signifies the tag colour - blue in this instance)

Sequence number for corresponding Ezytree map

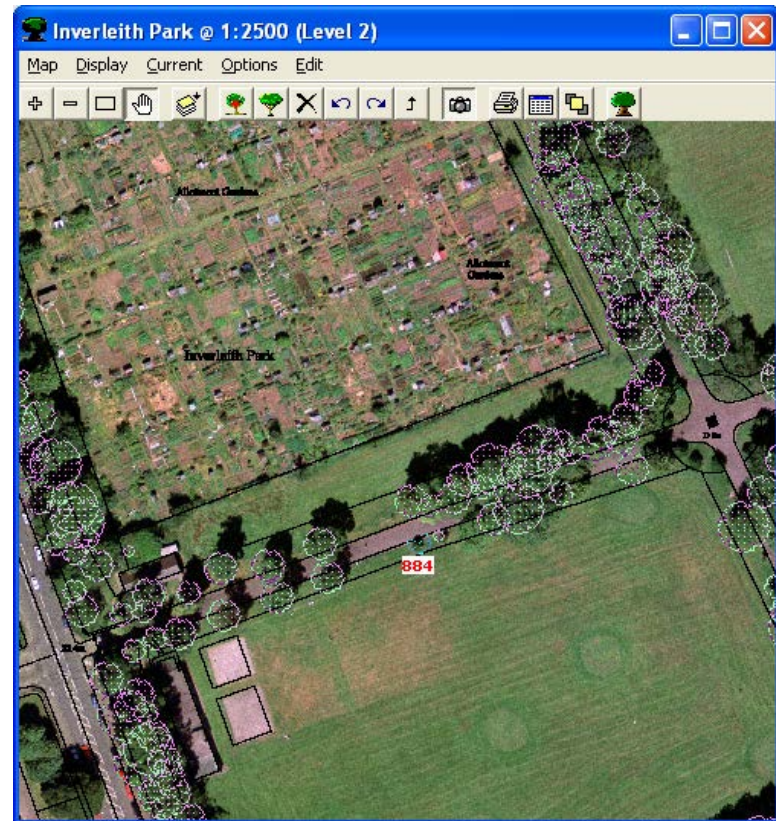
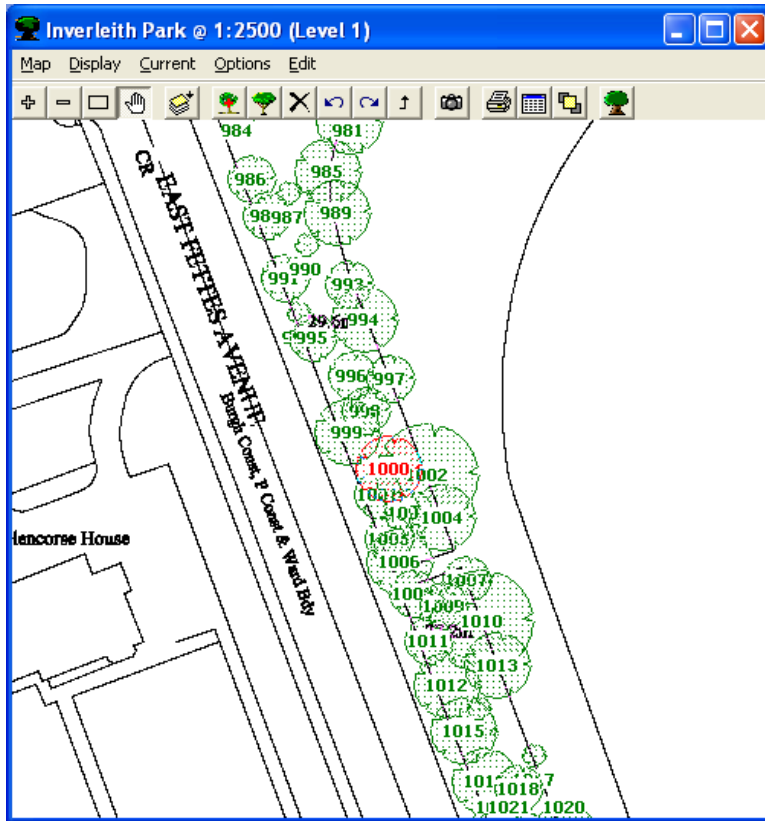
Date and time of inspection, along with initials of inspecting officer.

Abbreviations are used under the category headings – Features, Condition, Recommend, and Tree-Works. In this example; FP noted with Features means 'footpath under canopy'. RTSS noted under Recommend means 'return to second survey' (used for DED purposes).

One word summation for overall condition of tree – correlates with Lantra PTI training/guidance.

Priority demonstrates the urgency of recommendations given following assessment of trees condition.

Date of next conditional survey for this particular tree (5 year maintenance regime cycle).



# Parks and Greenspace

Item Ref: 01085

# Creation of Work Order

<b>Location:</b> DED2012 - East PSG (SF)	<b>Order no/ref:</b> 11 <b>Contract/Client Ref:</b> <b>Item created:</b> 12 September 2012
<b>Site type:</b>	<b>Priority of works:</b> <b>Start on/after:</b> 13 September 2012 <b>Complets by:</b> 11 October 2012

Tree/item code	Species/Work required	Quantity
----------------	-----------------------	----------

**East Princes Street Gardens (DE0159) City Centre**

Single tree No: 64 (019452) Wych Elm 01 - 159 - 12

4.3.1C	Remove Stump Grassed area	1 tree
4.2.2C	Section Fell	1 tree

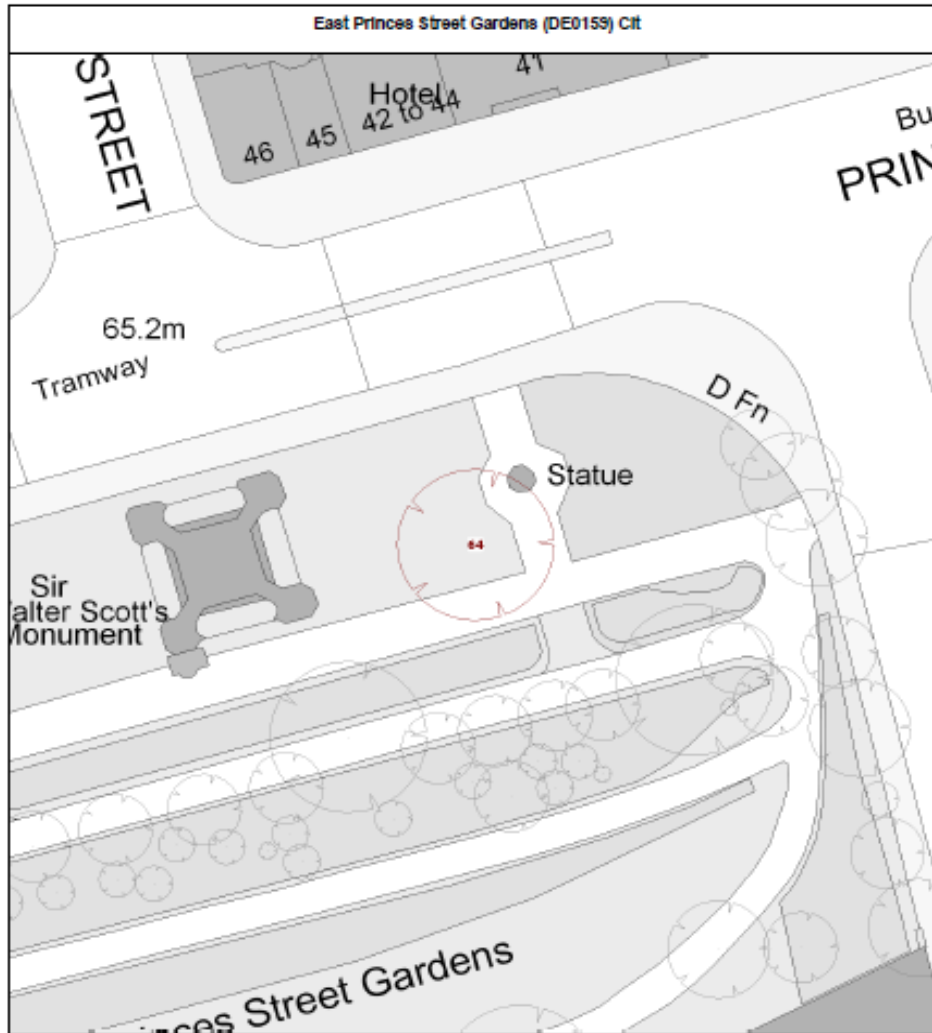
Tree no.1  
28/05/12  
Dieback and wilting on lower south canopy. Staining confirmed.

<b>Schedule item analysis :-</b>		
4.2.2C	Section Felling - Large	1 tree
4.3.1C	Stump Maceration - Large	1 tree

<b>Contractor:</b> CEC Forestry  Works scheduled for Monday 17/09/12, confirmed works with Tom (Princes St Gdns staff). Tom confirmed he will get this area of the park closed off on the morning of the 17th in preparation for the works.  Stump to be ground out immediately following removal of tree.	[Empty box]  <b>Issued by:</b>  Ian Morrison
--	--

# Work Order Map

## Elm Tree East Princes Street Gardens

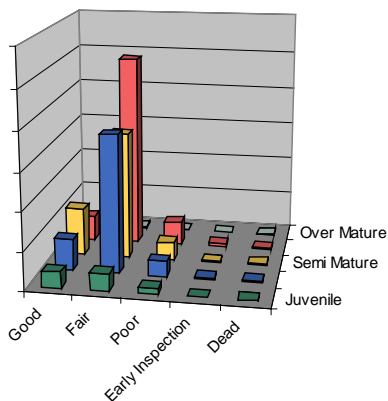


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### Outline survey results: -

- Species >100 different species
- 11% of all trees in Poor (or worse) condition.
- ~1% Early Inspection.

Condition x Age Class



	% Total Species	of which Poor (or below)
Acer	28.6%	11%
Prunus	12.8%	10%
Sorbus	11.9%	11%
Tilia	9.4%	6%
Ulmus	7.6%	12%
Fraxinus	5.8%	17%
Betula	4.2%	5%
Fagus	2.2%	9%
Quercus	1.9%	14%
Aesculus	1.5%	12%
Salix	1.5%	22%
Taxus	1.3%	2%
Populus	1.0%	13%
Other (27genera)	10.2%	60%
	100.0%	11%

## Outline survey results: -

- Targets in falling distance of Poor (or worse) trees

Target	%
Road	43%
Paved Path	13%
Cycle/Walkway	17%
Occ'd Property	6%
Boundary	3%
Greenspace	11%
Woodland Path	8%
Grand Total	100%



# PICUS

Pholiota  
squarrosa  
on  
Whitebeam



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Picus: s

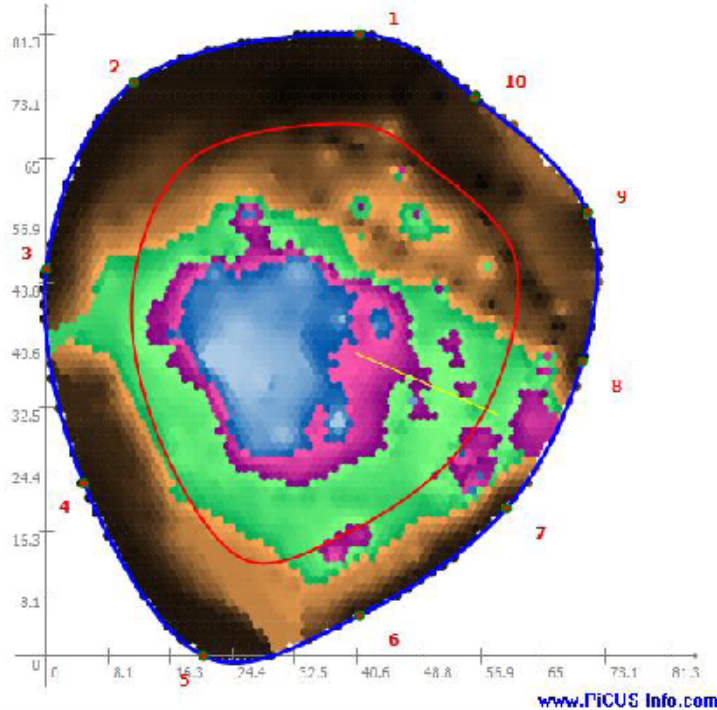
Client:



Tree Expert:

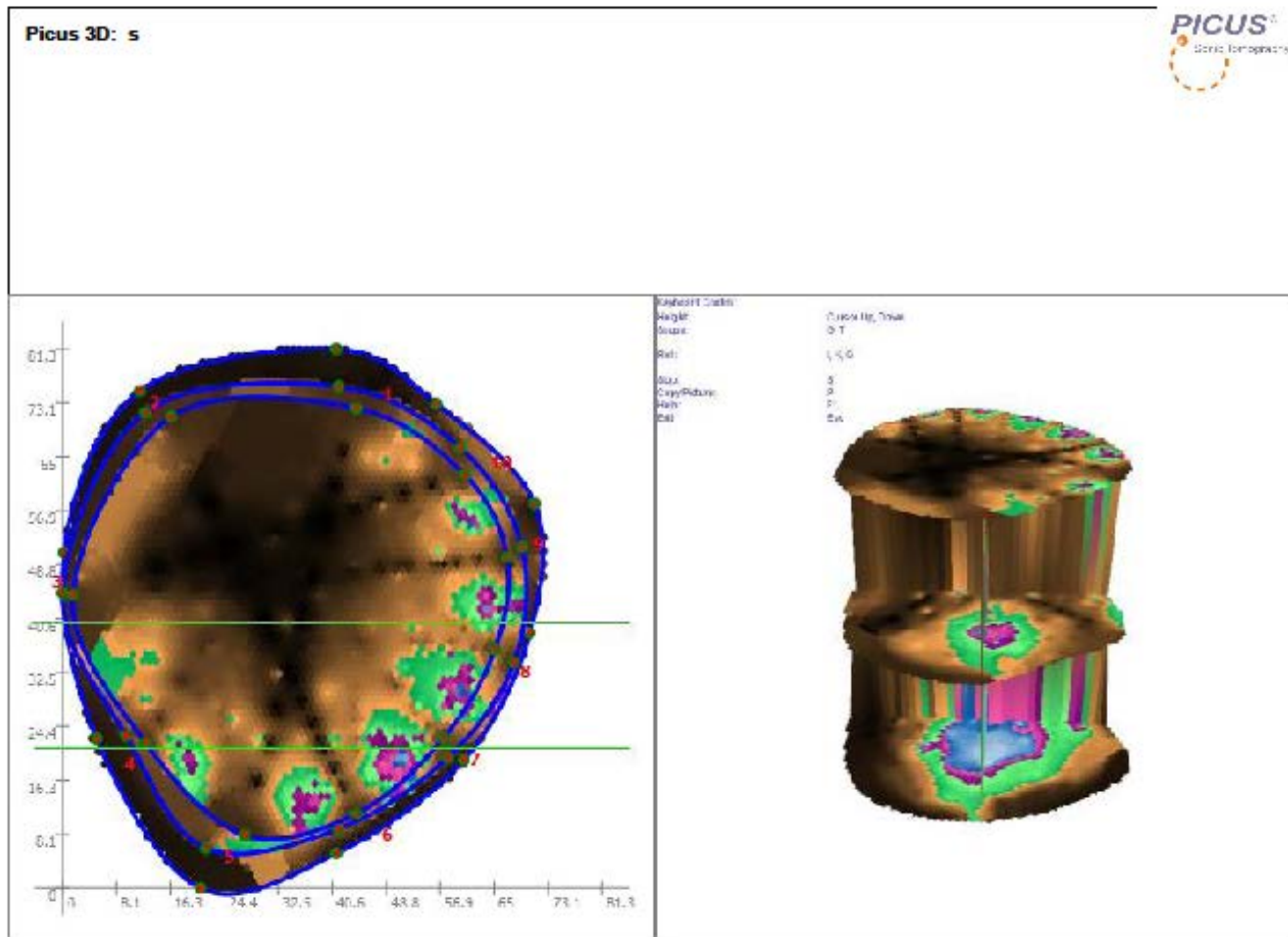
Tel:  
Fax:  
Domain:  
email: john.morrison@edinburgh.gov.uk

Tree species:	ash	Tree height [m]:	16
Town:		North at measuring point:	1
Neighbourhood:	s	Crown spread [m]:	
Park:	the meadows	Position of measuring point 1:	
Number of tree:	g00211	Trunk circumference (130cm height)[cm]:	238
Measure date:	4/15/13 12:29:21 PM	Tomography level at height [cm]:	60



# 2D PICUS Scan

# 3D PICUS Scan



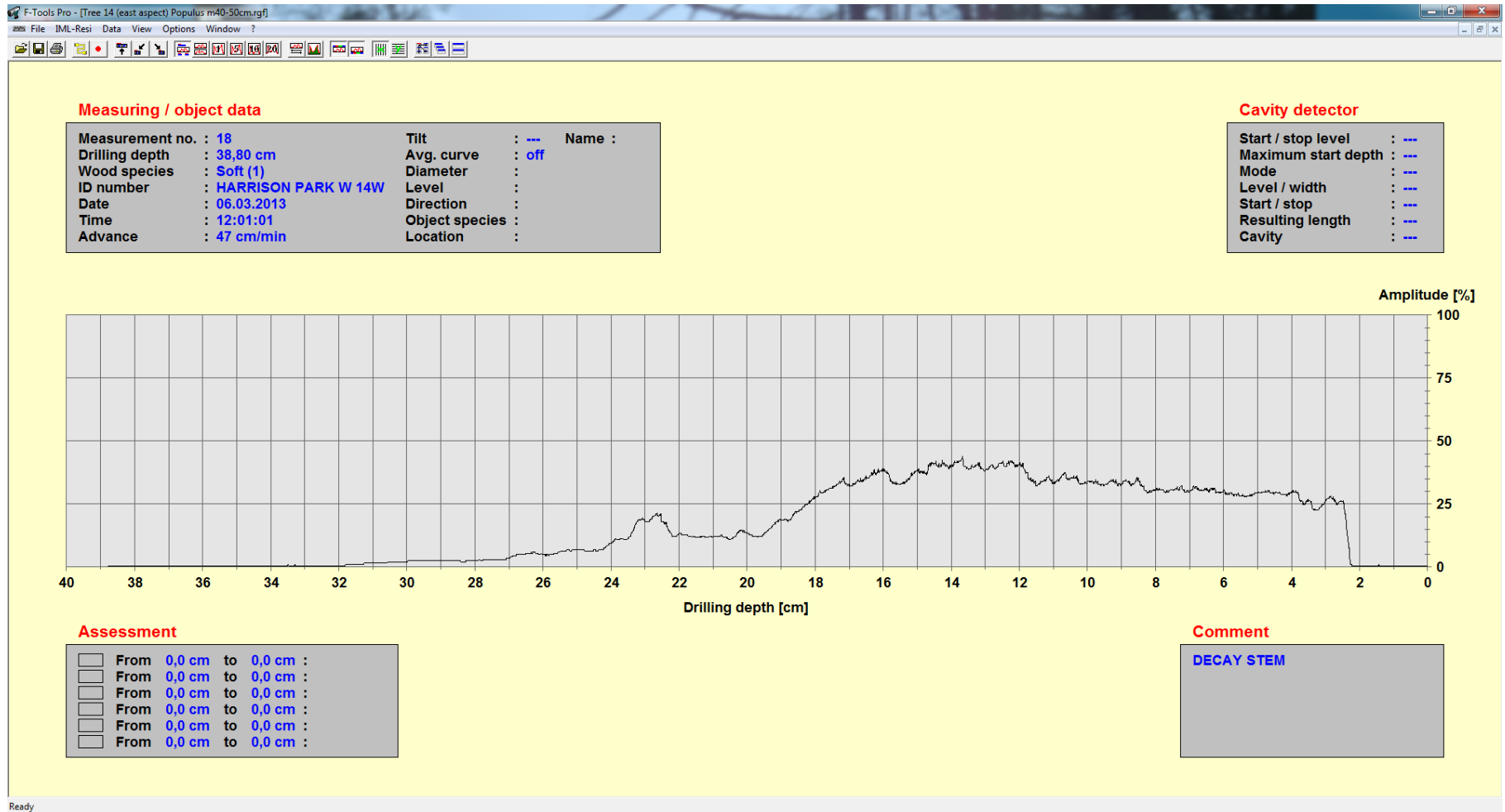
# Resistograph

Whitebeam

Inverleith  
Park  
Edinburgh



# IML Resistograph - Poplar (Harrison Park West)



# Key Lessons

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# Trees are not scary!



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## Next steps?

Are your Corporate liabilities  
currently fully addressed?



# Trees For Cities



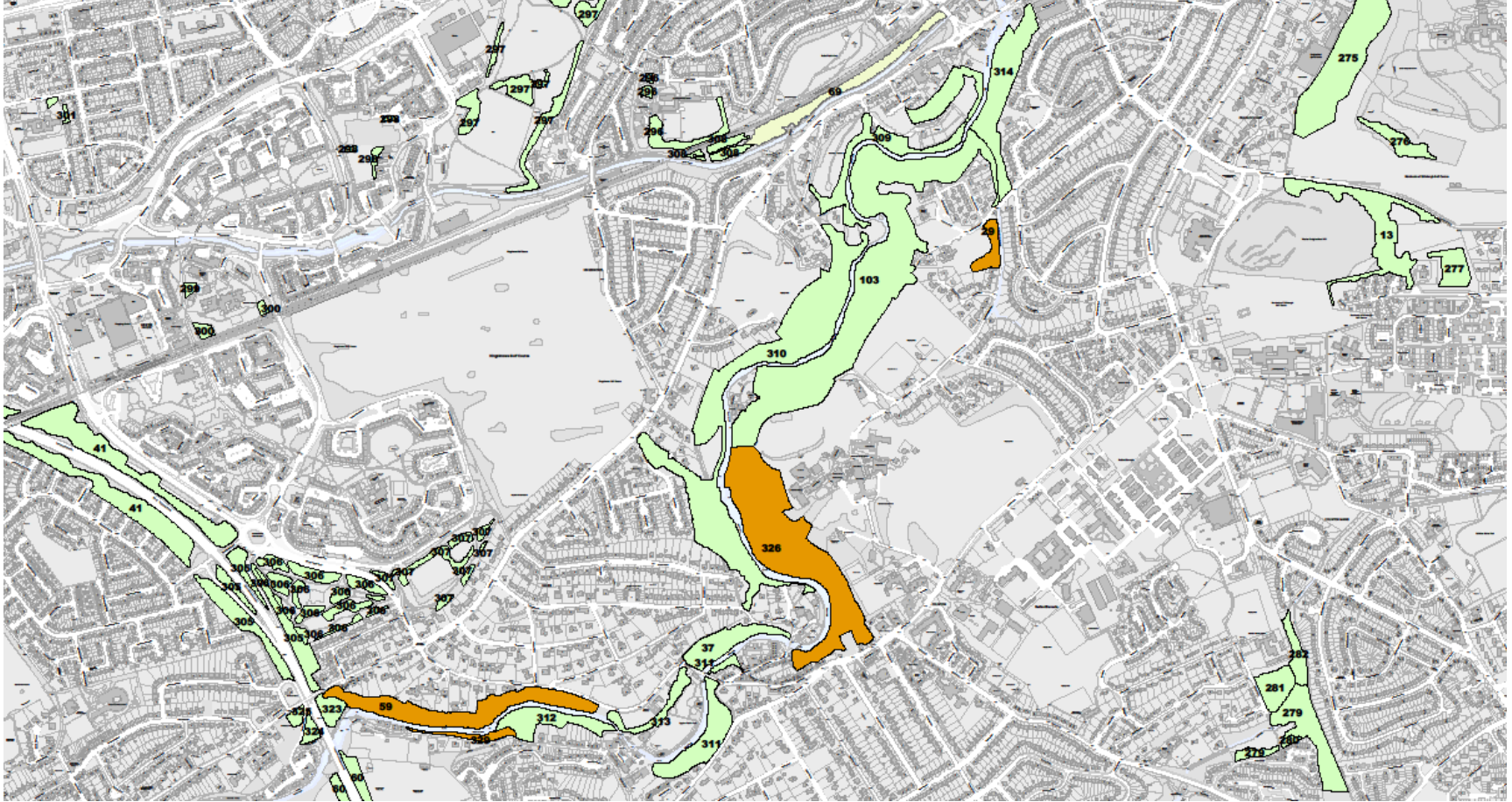
1 Million Trees for  
NYC

Without resource  
you cannot do  
anything.

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# Woodland Ownership in Edinburgh



Craiglockhart & Colinton Dell, Spylaw

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# City of Edinburgh Council Woodland Inventory

We have mapped **368** separate areas of woodland, ranging from as small as 0.05Ha up to 70.5Ha.

1. Total woodland area currently mapped on the CEC inventory inclusive of privately owned land presently stands at **1020 Ha**.
2. The inventory shows public woodland ownership to be just over half the total woodland cover within Edinburgh at **538.7 Ha**.

- K eep
- I t
- S imple
- S tupid

# Are you competent?



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- **i-Tree Eco**

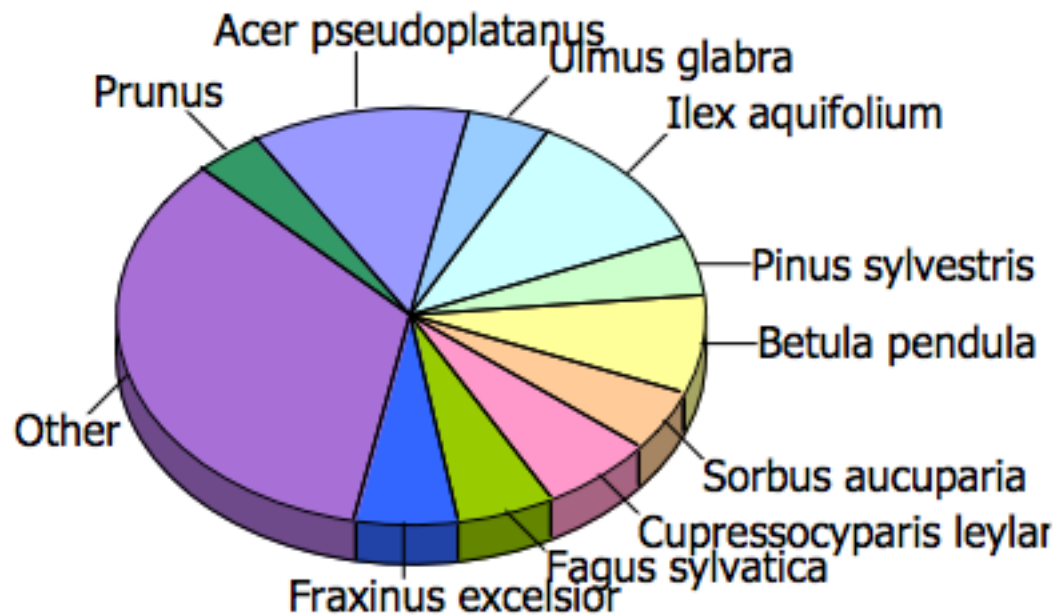
i-Tree Eco is a software application designed to use field data from complete inventories or randomly located plots throughout a community along with local hourly air pollution and meteorological data to quantify urban forest structure, environmental effects, and value to communities. Baseline data can be used for making effective resource management decisions, develop policy and set priorities.

## i-tree eco

- Edinburgh has over **600,000** trees and their canopies are estimated to cover **17.0%** of the total land area.
- Over half of Edinburgh's trees are native to Scotland (ten most common tree species which make up over **65%** of the total population include: sycamore, holly, silver birch, Leyland cypress, ash, beech, rowan, Scots pine, Wych elm and cherry.
- **71%** of Edinburgh's trees were assessed as being in an 'excellent' condition and **15%** being in 'critical', 'dying' or 'dead' condition.



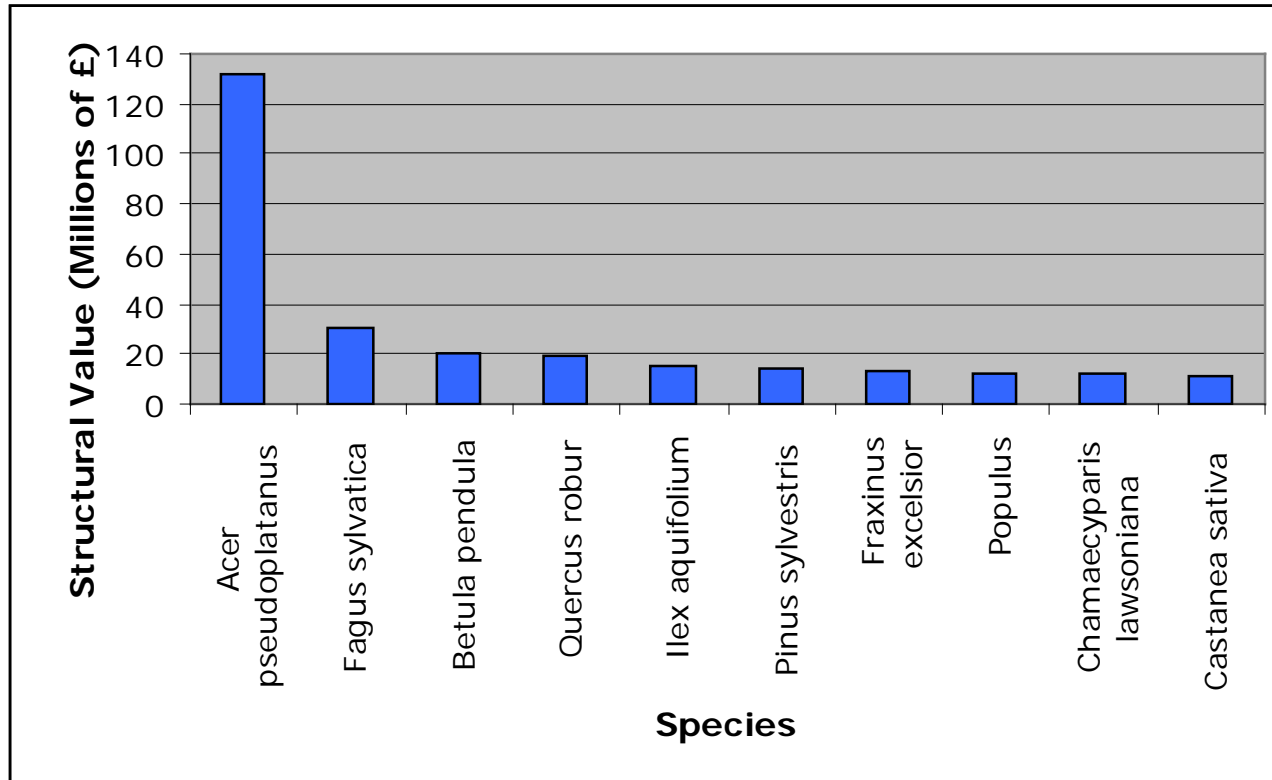
# Tree species composition in Edinburgh



Parks and Greenspace

## Structural values for 2011:

Structural value: £382 million Carbon storage:



# CAVAT Tree Value

HOME INTRODUCTION CAVAT METHODS RESOURCES FOR PRACTITIONERS LINKS

CONTACT THE AUTHOR



**C**apital  
**A**sset  
**V**aluation  
**A**menity  
**T**rees

Trees are essential environmental capital. CAVAT expresses tree value in monetary terms. CAVAT's main aim is to enable asset value management of the urban, public tree stock.

CAVAT also helps decision makers by expressing the value of individual trees and by calculating realistic compensation where trees are damaged or have to be felled. This site will allow you to understand:

- What CAVAT is for
- How it has been developed
- How to use it.

Create a free website with woobly

## CAVAT - 5 Steps

There are 5 steps with associated variables in the CAVAT full method, these are:

- 1) Step 1: Basic value – unit value x size
- 2) Step 2: CTI value – location, in terms of population and accessibility.
- 3) Step 3: Functional value – functional status.
- 4) Step 4: Adjusted value – amenity and appropriateness.
- 5) Step 5: Full value – safe life expectancy.

The 5 steps are explained fully in the CAVAT Users' Guide, see [LTOA.org.uk](http://LTOA.org.uk). In summary:

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# Building natural value for sustainable economic development: Green Infrastructure Valuation Toolkit



## Using the toolkit

- 1 Climate change adaptation and mitigation
- 2 Flood alleviation and water management
- 3 Place and communities
- 4 Health and wellbeing
- 5 Land and property values
- 6 Investment
- 7 Labour productivity
- 8 Tourism
- 9 Recreation and leisure
- 10 Biodiversity
- 11 Land management

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# Profile = Resource?



Thank You

Steven Webley  
Forestry Manager

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