How to run a successful i-Tree citizen science project

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4th European i-Tree Conference and Urban ReLeaf Plenary

Dundee – 19-06-2024

Objectives of the workshop

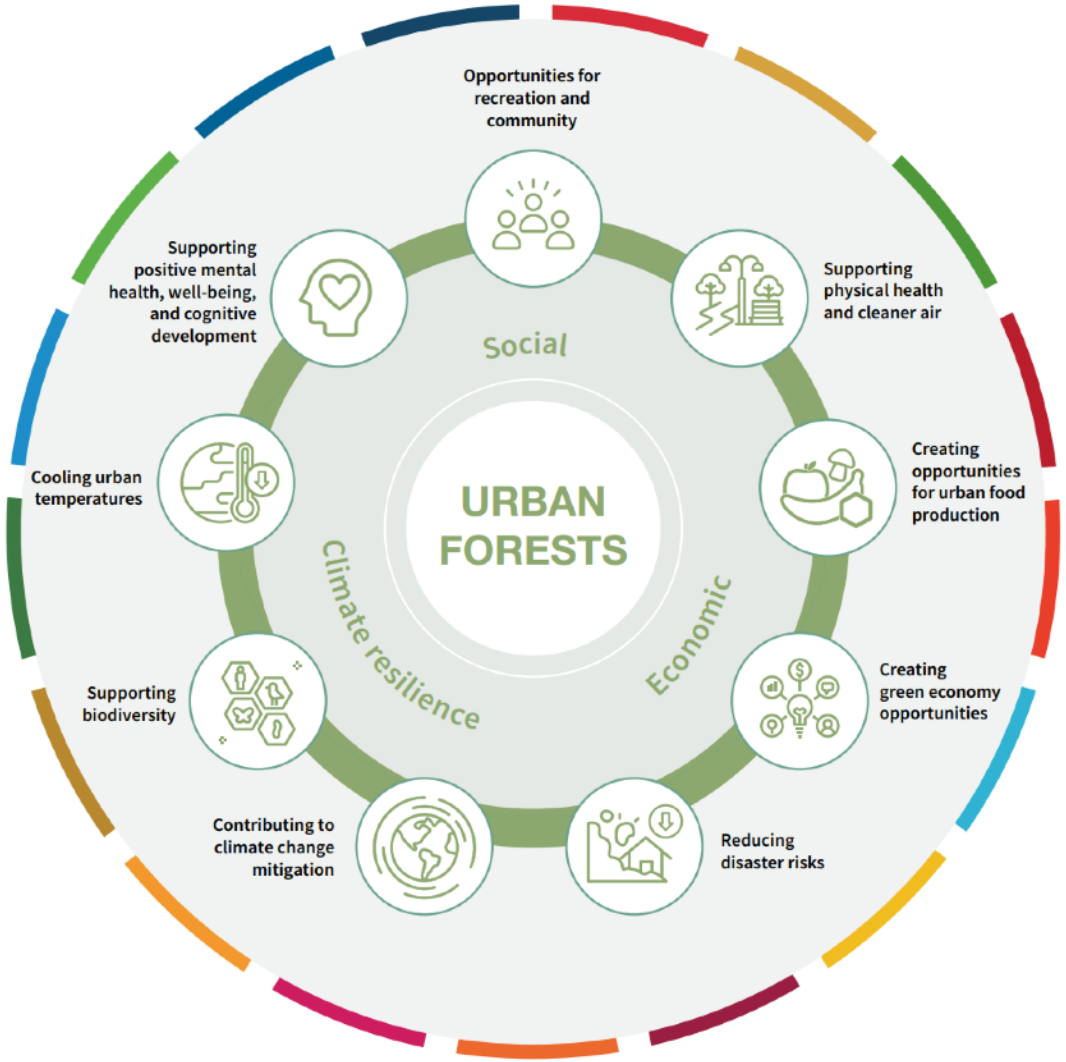
Presentation: Get a good understanding of:

- ➢ What is i-Tree (Eco)
- ➢ What can i-Tree Eco be used for (project examples)
- ➢ Planning an i-Tree project

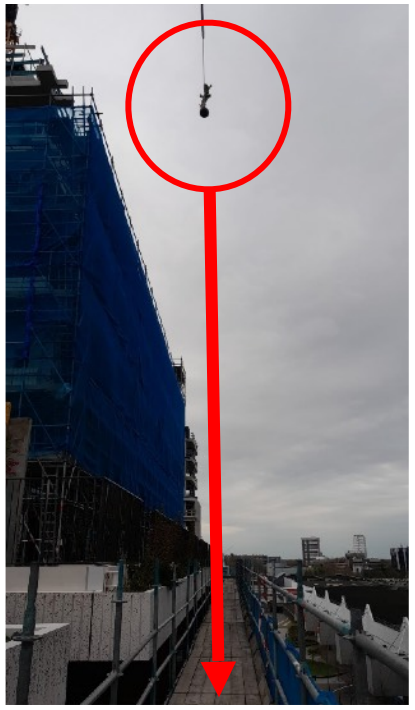
Hands on: define your own i-Tree Eco project

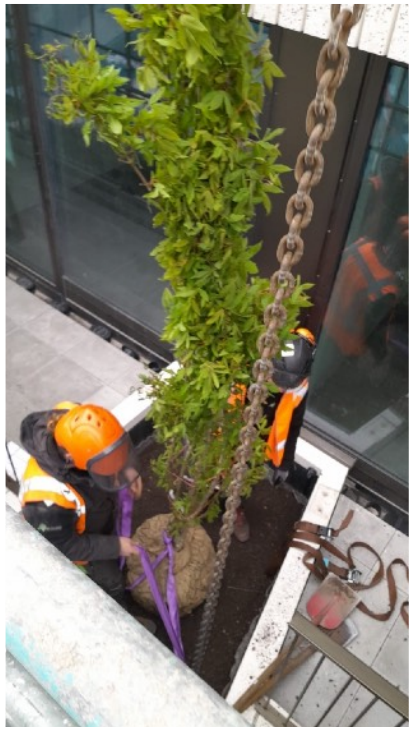

Peter Jolly Northpix

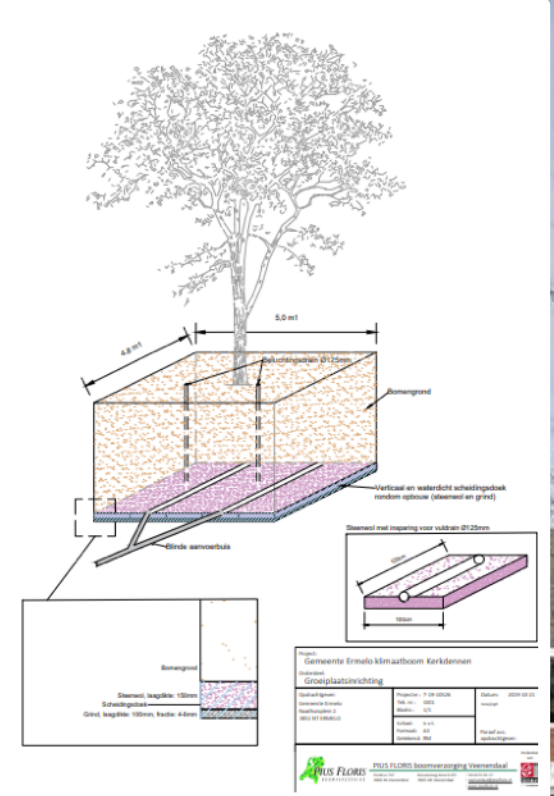
Value of sustainable Urban Forests



Google Earth - Amsterdam






5,0 m1
4,0 m1
Verticaal en waterdicht scheidingsdoek rondom opbouw (steenwol en grind)
Blinde aanvoerbuis
Steenwol met insparing voor vuldrain Ø125mm
Gemeente Ermelo klimaatboom Kerkdennen
Groeiplaatsinrichting
PIUS FLORIS boomverzorging Veenendaal


BOERI
STEFANO
BOERI
ARCHITETTI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https://www.bollenstreekomroep.nl/


https://www.gelderlander.nl

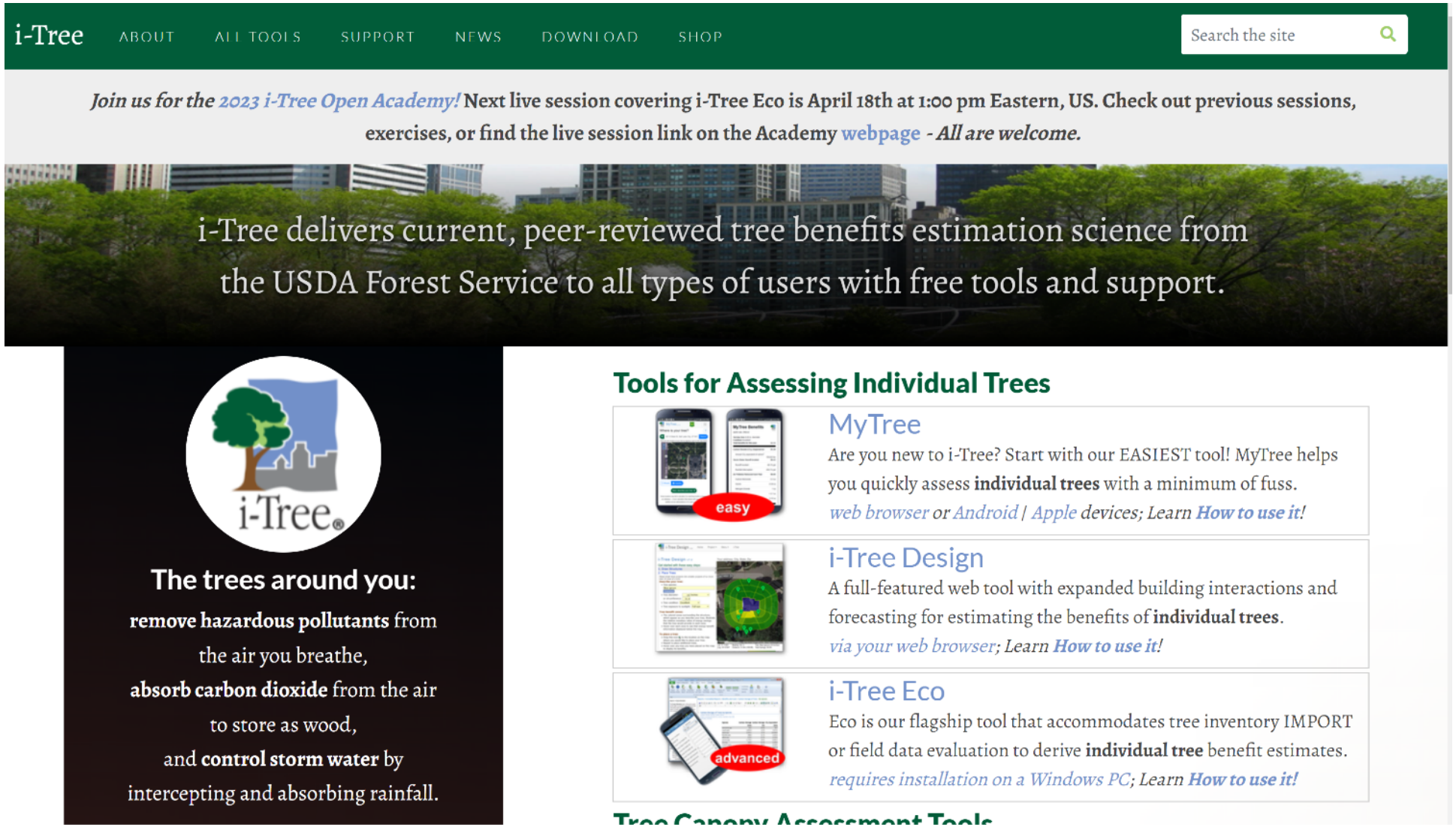

https://www.thuisinmaastricht.nl/

The Benefits of Trees

Times are changing

Introduction of i-Tree

“Putting USFS Urban Forest science into the hands of users”

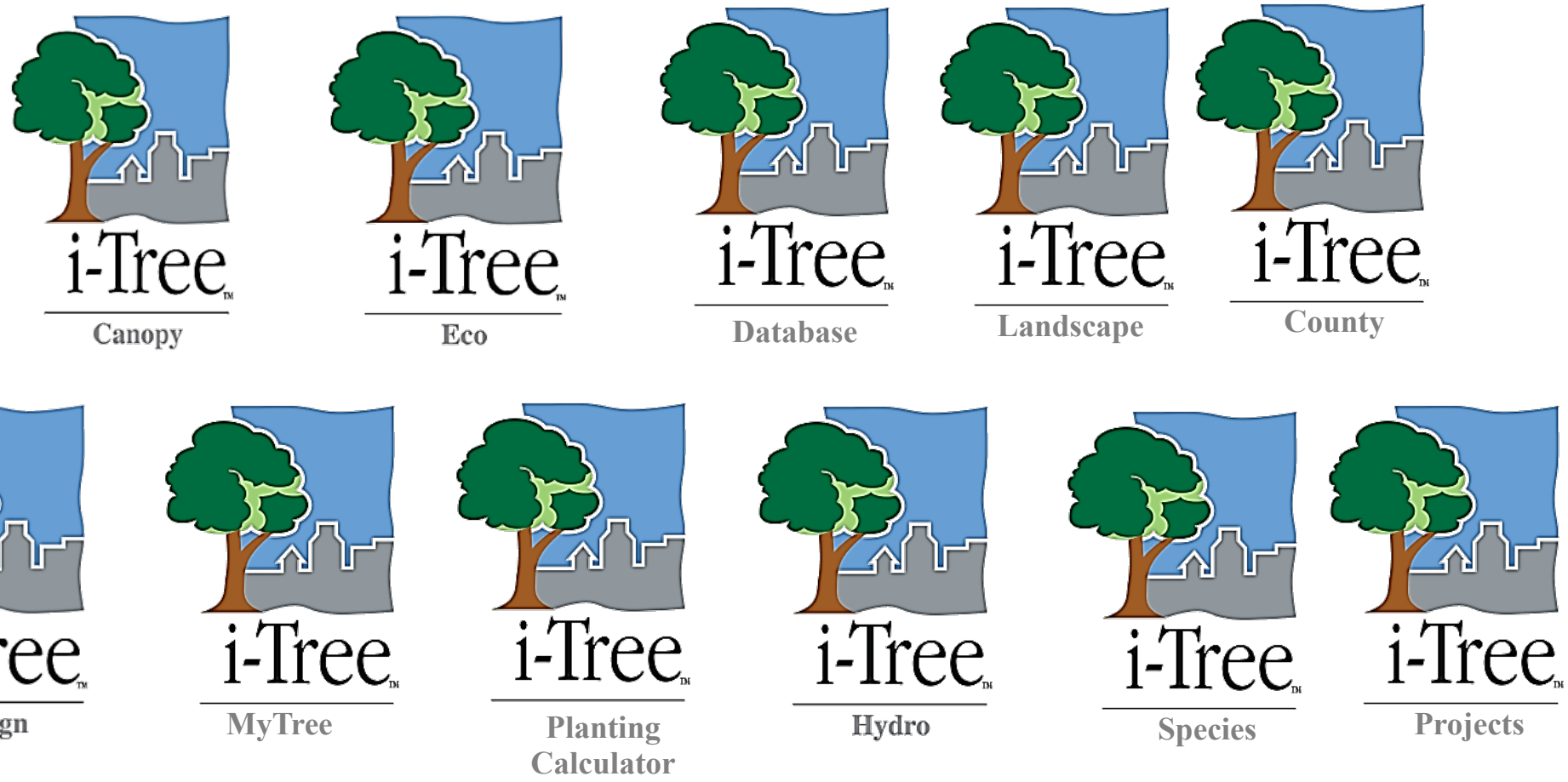


Development of i-Tree

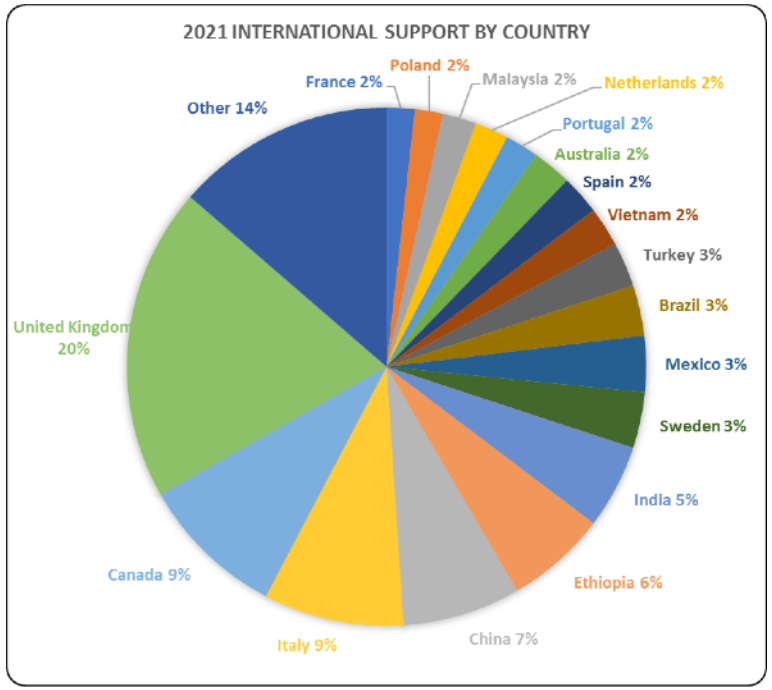
- i-Tree: **I**ntegrated **T**ree **R**esources – **E**nvironmental and **E**conomic
- First release: 2006, USA
- Based on:
  - USDA Forest Service's Urban Forest Effects model (UFORE)
  - Street Tree Resource Assessment Tool for Urban Forest Managers model (STRATUM)
- Public domain free set of software tools
- Based on peer-reviewed research
- Technical support and continuously improved

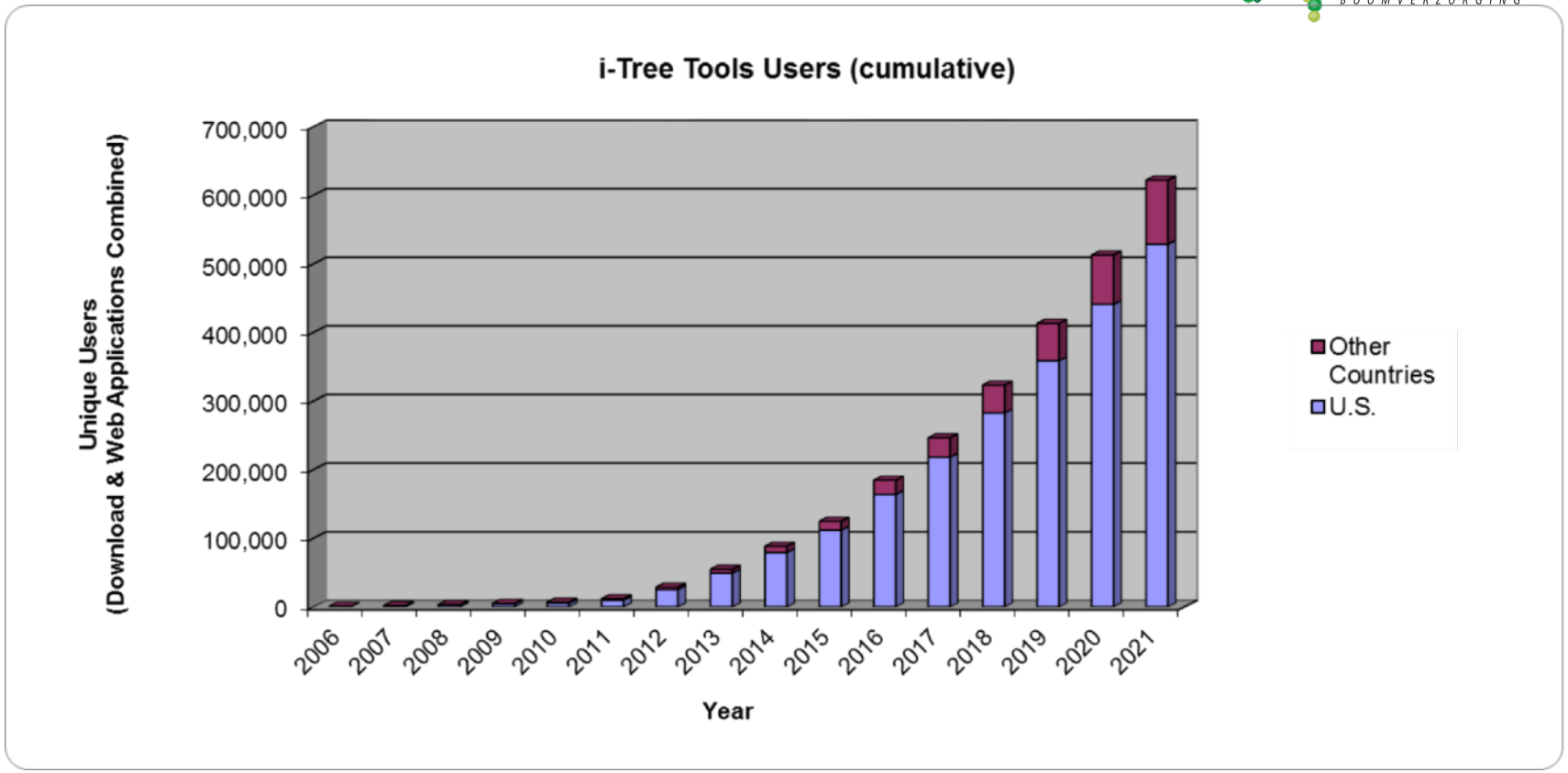
i-Tree is a Cooperative Initiative

The 2024 i-Tree Suite of Tools



Unique i-Tree users





Support

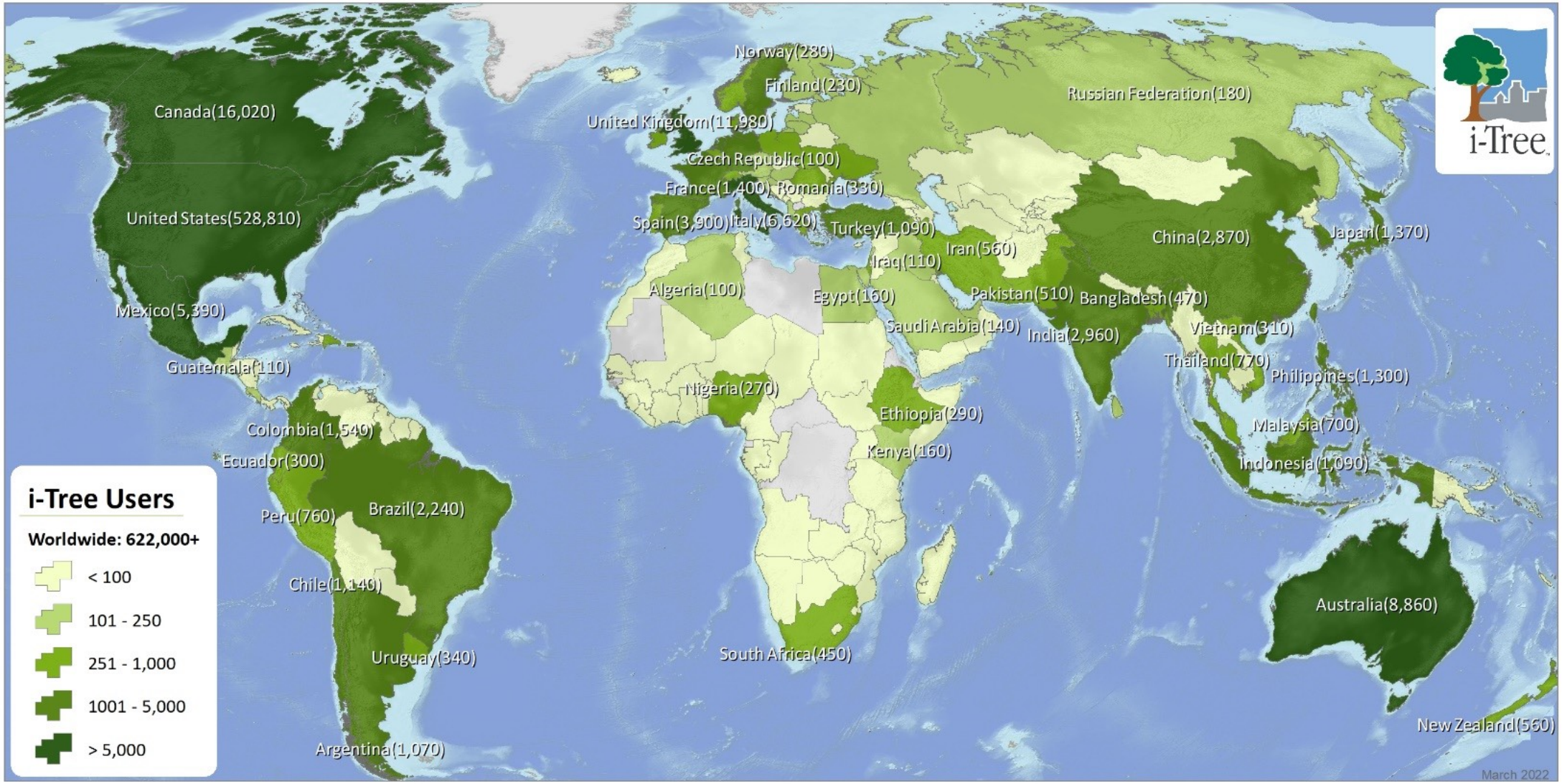
Support in 57 countries in 2021

51% of the support international (49% domestic)

International growth

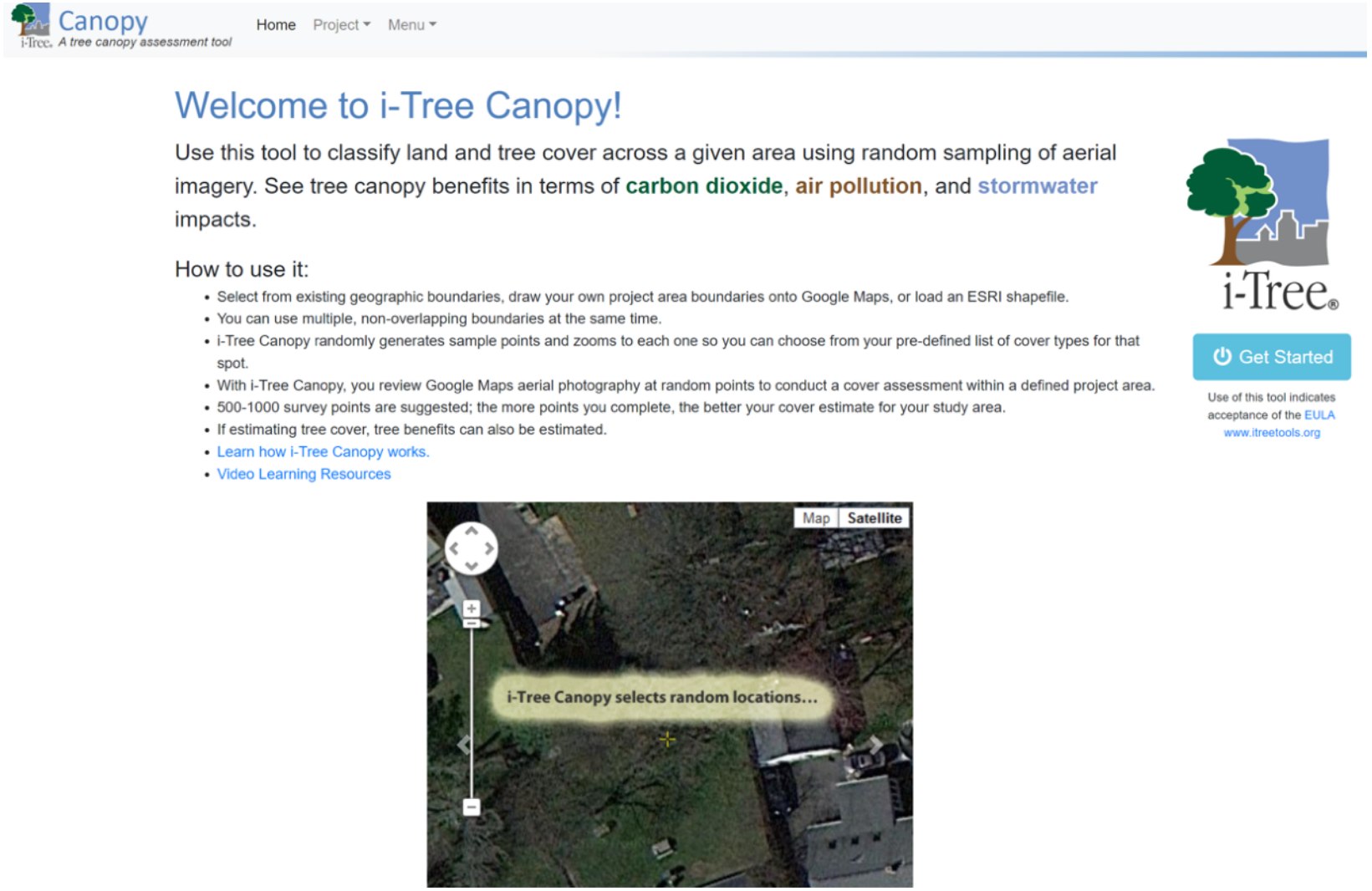
In 2021, international users alone represented over 93,000: 21,500 more than 2020, and more than the total number of all users during the first 9 years of i-Tree's existence (2006-2014).

i-Tree Users worldwide



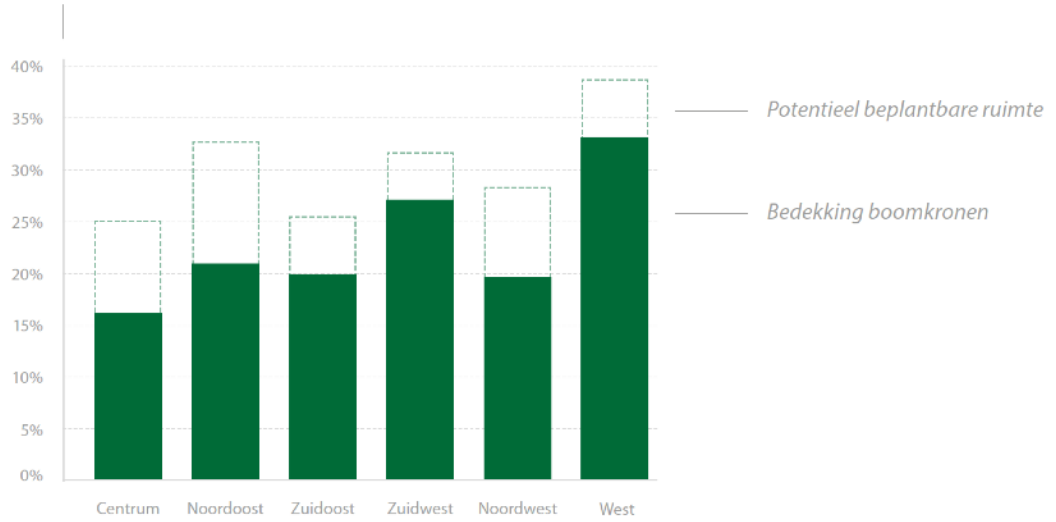
i-Tree in Europe – Canopy and Eco

i-Tree Canopy

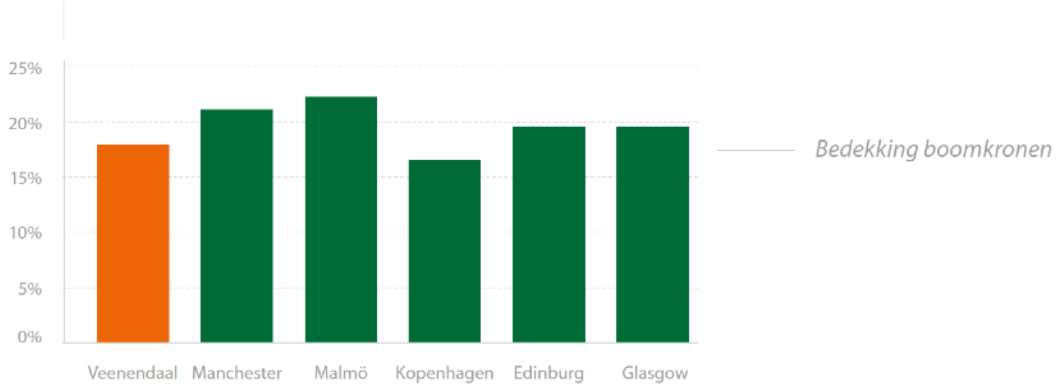


i-Tree Canopy – The Results

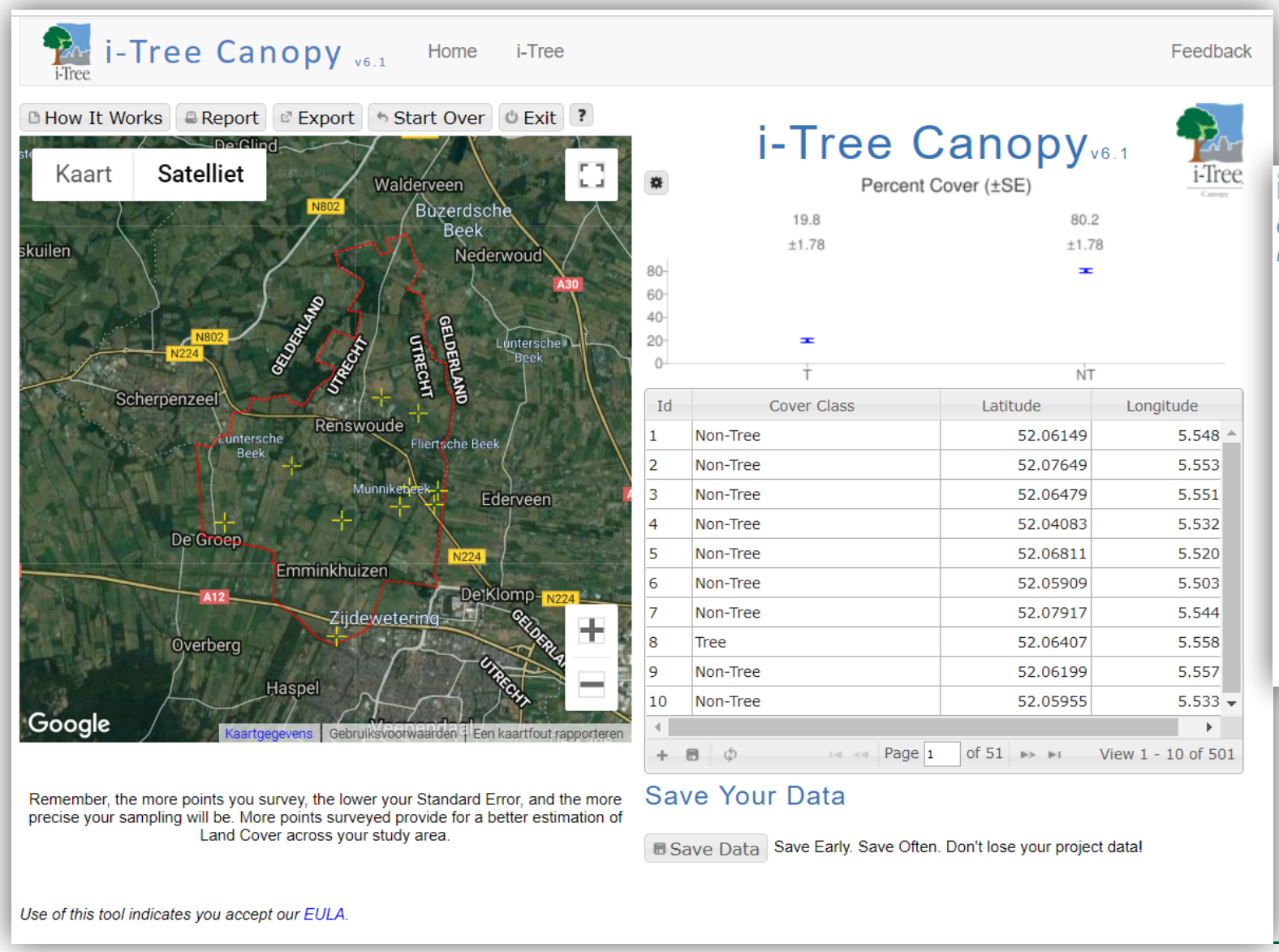
Vergelijk bladoppervlak tussen de wijken in Veenendaal

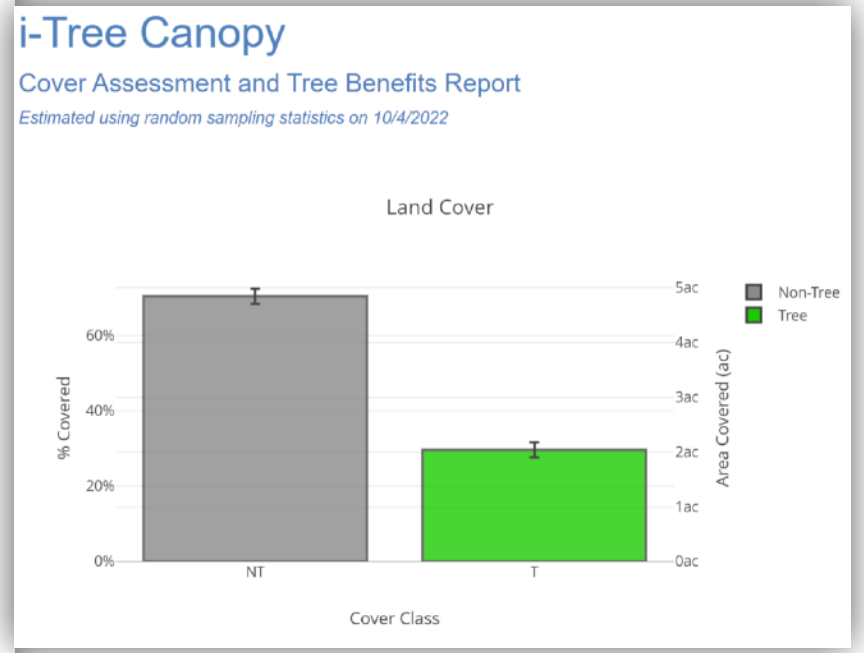


Vergelijk bladoppervlak met internationale steden

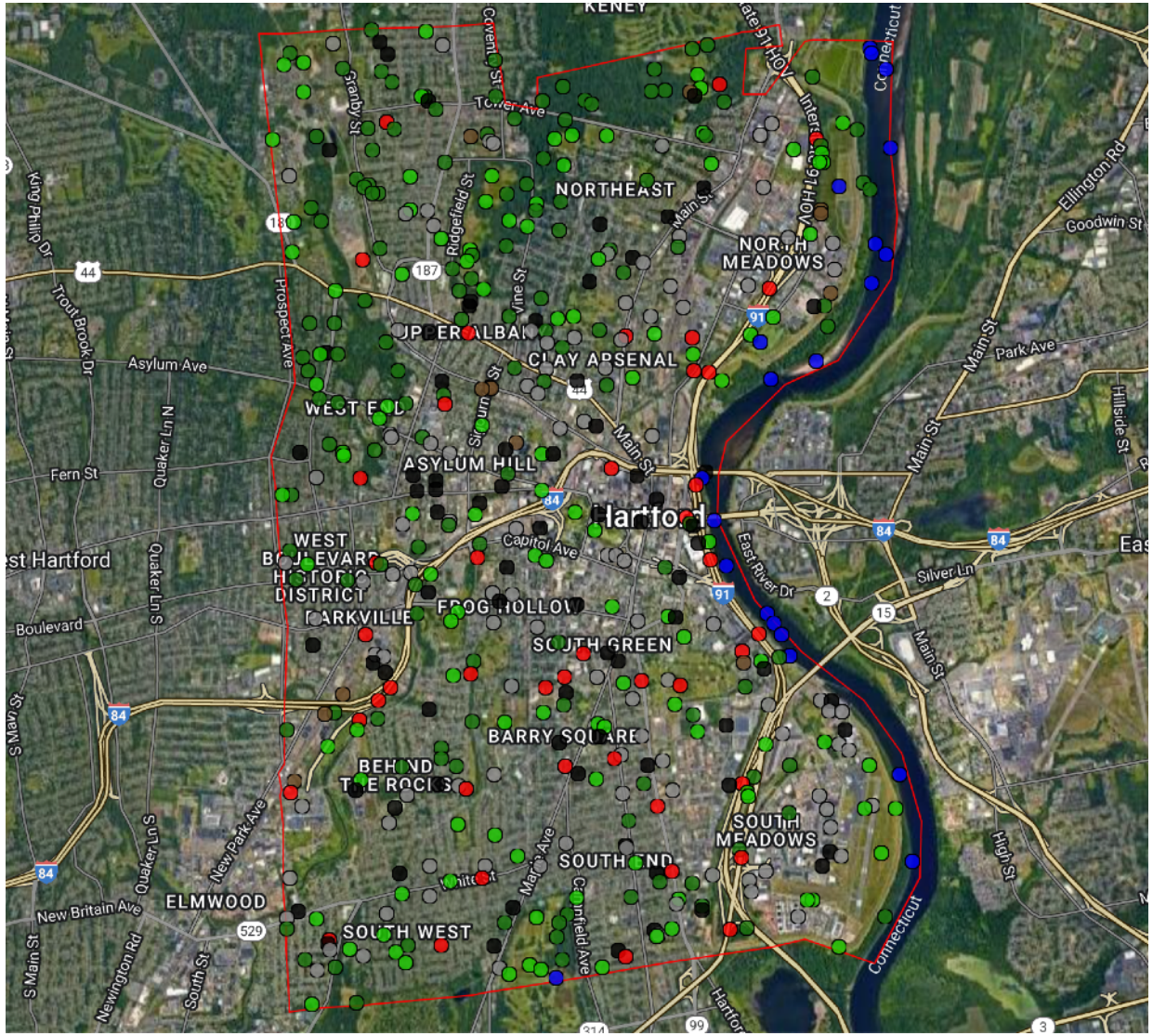


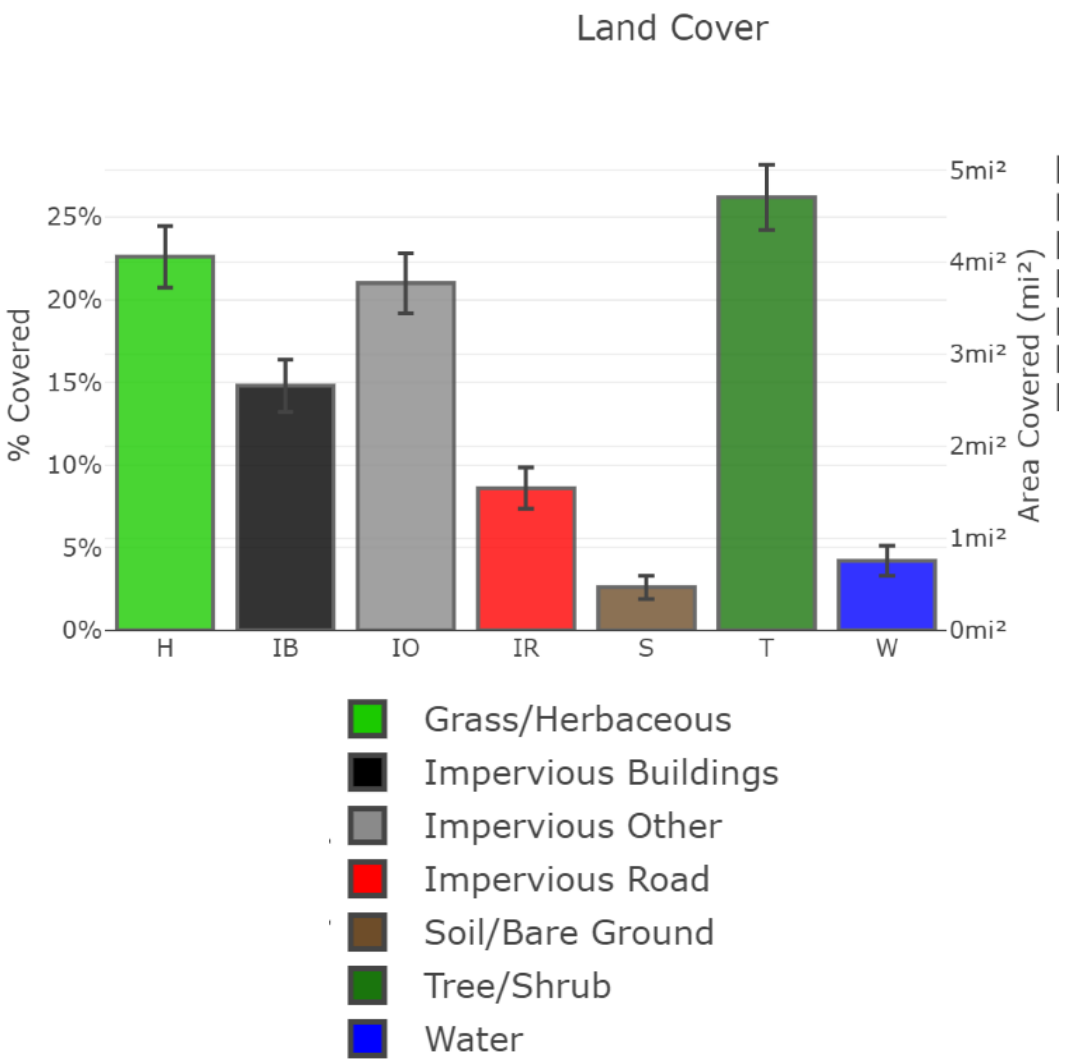
i-Tree Canopy – How it works



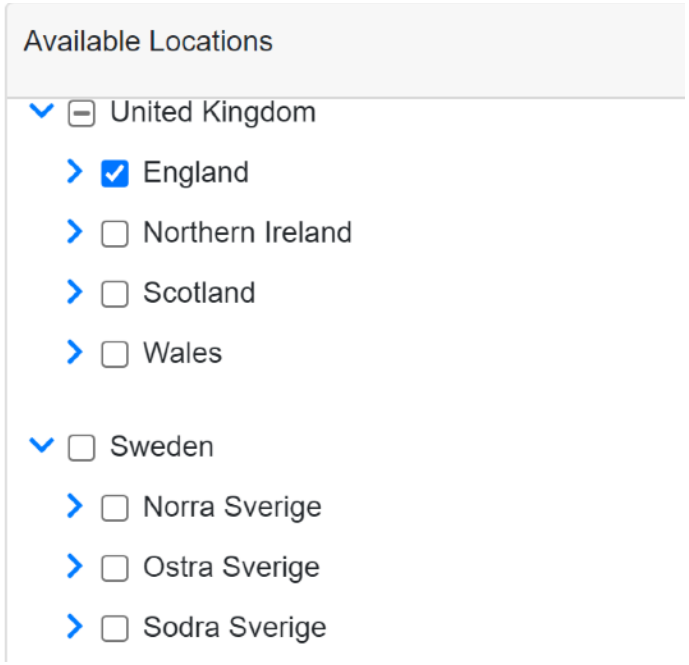


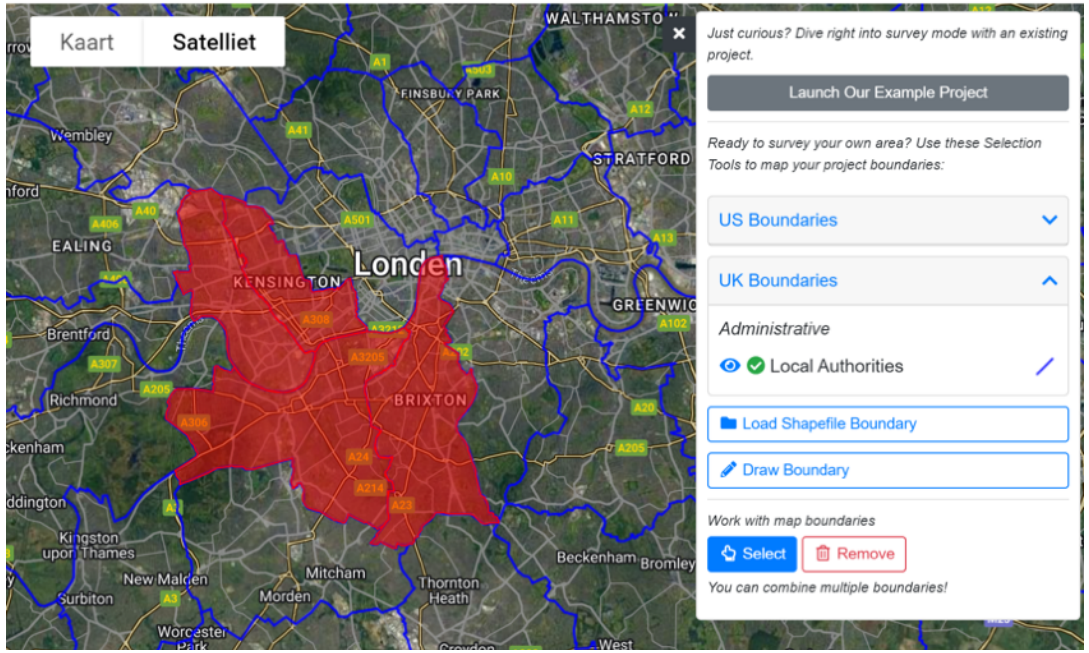
i-Tree Canopy – Example project





i-Tree canopy – estimated benefits UK and SE



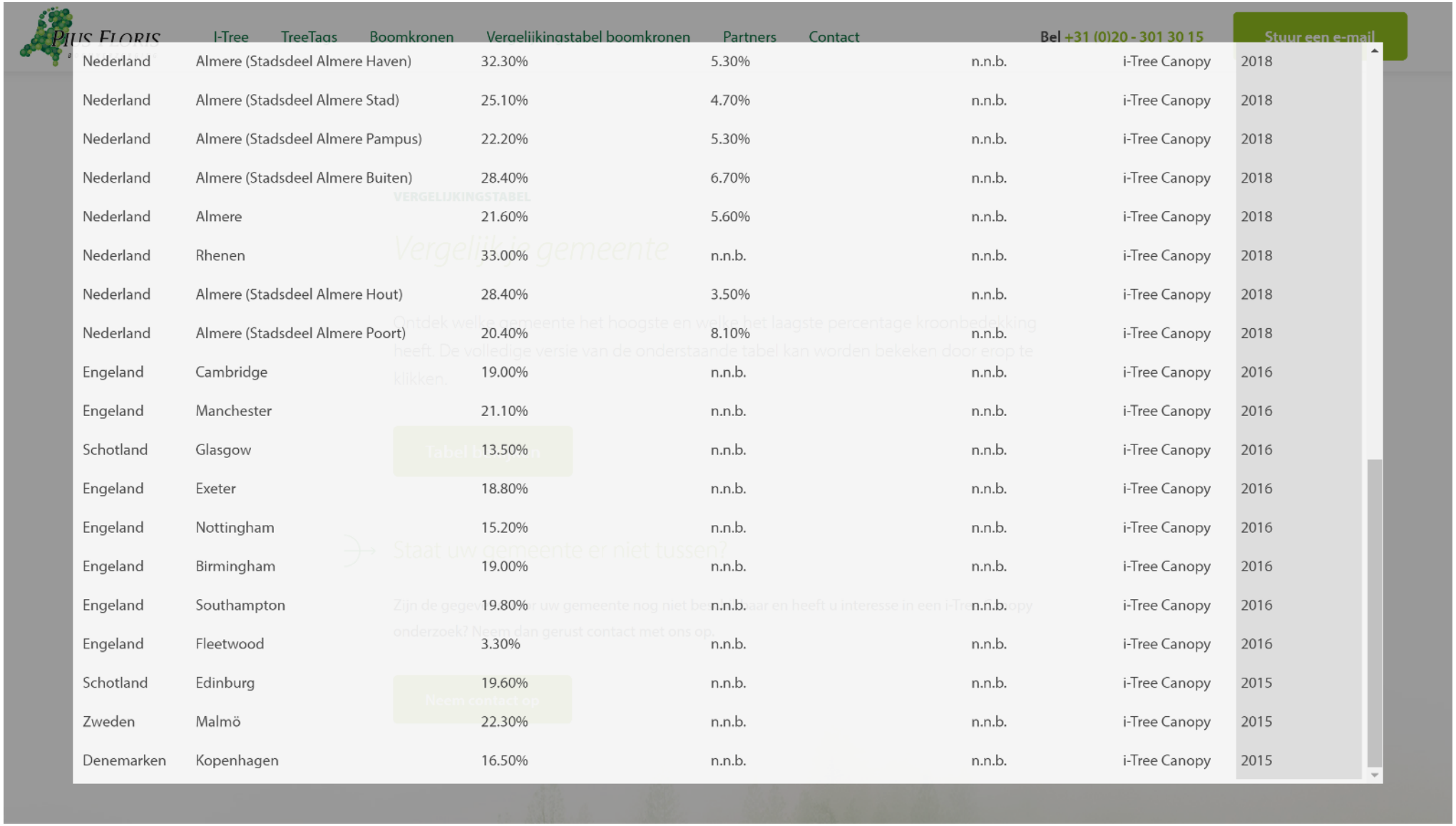


Tree Benefit Estimates: Air Pollution (English units)

Abbr.	Description	Amount (oz)	±SE	Value (USD)	±SE
CO	Carbon Monoxide removed annually	0.07	±0.07	$0	±0
NO2	Nitrogen Dioxide removed annually	966,700.90	±966,700.90	$9,622	±9,622
O3	Ozone removed annually	3,417,549.03	±3,417,549.03	$181,654	±181,654
SO2	Sulfur Dioxide removed annually	127,598.17	±127,598.17	$486	±486
PM2.5	Particulate Matter less than 2.5 microns removed annually	375,071.68	±375,071.68	$753,355	±753,355
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	677,724.96	±677,724.96	$801,840	±801,840
Total		**5,564,644.81**	**±5,564,644.81**	**$1,746,958**	**±1,746,958**

Currency is in USD and rounded. Standard errors of removal and benefit amounts are based on standard errors of sampled and classified points. Air Pollution Estimates are based on these values in oz/mi²/yr @ $/oz/yr and rounded:
CO 0.007 @ $0.03 | NO2 107,499.994 @ $0.01 | O3 380,041.543 @ $0.05 | SO2 14,189.294 @ $0.00 | PM2.5 41,709.078 @ $2.01 | PM10* 75,365.017 @ $1.18 (English units: oz = ounces, mi² = square miles)

Benchmark canopy cover



Nederland	Almere (Stadsdeel Almere Haven)	32.30%	5.30%	n.n.b.	i-Tree Canopy	2018
Nederland	Almere (Stadsdeel Almere Stad)	25.10%	4.70%	n.n.b.	i-Tree Canopy	2018
Nederland	Almere (Stadsdeel Almere Pampus)	22.20%	5.30%	n.n.b.	i-Tree Canopy	2018
Nederland	Almere (Stadsdeel Almere Buiten)	28.40%	6.70%	n.n.b.	i-Tree Canopy	2018
Nederland	Almere	21.60%	5.60%	n.n.b.	i-Tree Canopy	2018
Nederland	Rhenen	33.00%	n.n.b.	n.n.b.	i-Tree Canopy	2018
Nederland	Almere (Stadsdeel Almere Hout)	28.40%	3.50%	n.n.b.	i-Tree Canopy	2018
Nederland	Almere (Stadsdeel Almere Poort)	20.40%	8.10%	n.n.b.	i-Tree Canopy	2018
Engeland	Cambridge	19.00%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Engeland	Manchester	21.10%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Schotland	Glasgow	13.50%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Engeland	Exeter	18.80%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Engeland	Nottingham	15.20%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Engeland	Birmingham	19.00%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Engeland	Southampton	19.80%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Engeland	Fleetwood	3.30%	n.n.b.	n.n.b.	i-Tree Canopy	2016
Schotland	Edinburg	19.60%	n.n.b.	n.n.b.	i-Tree Canopy	2015
Zweden	Malmö	22.30%	n.n.b.	n.n.b.	i-Tree Canopy	2015
Denemarken	Kopenhagen	16.50%	n.n.b.	n.n.b.	i-Tree Canopy	2015

i-Tree Eco


i-Tree
Eco


i-Tree Eco
version 6
Forest and Community Trees assessment:
• Structure
• Environment Effects
• Value
starting up...
i-Tree
www.itreetools.org
i-Tree Eco
i-Tree Landscape
i-Tree Design
i-Tree Canopy
i-Tree Planting
MyTree
DAVEY
Arbor Day Foundation
ISA
ESF

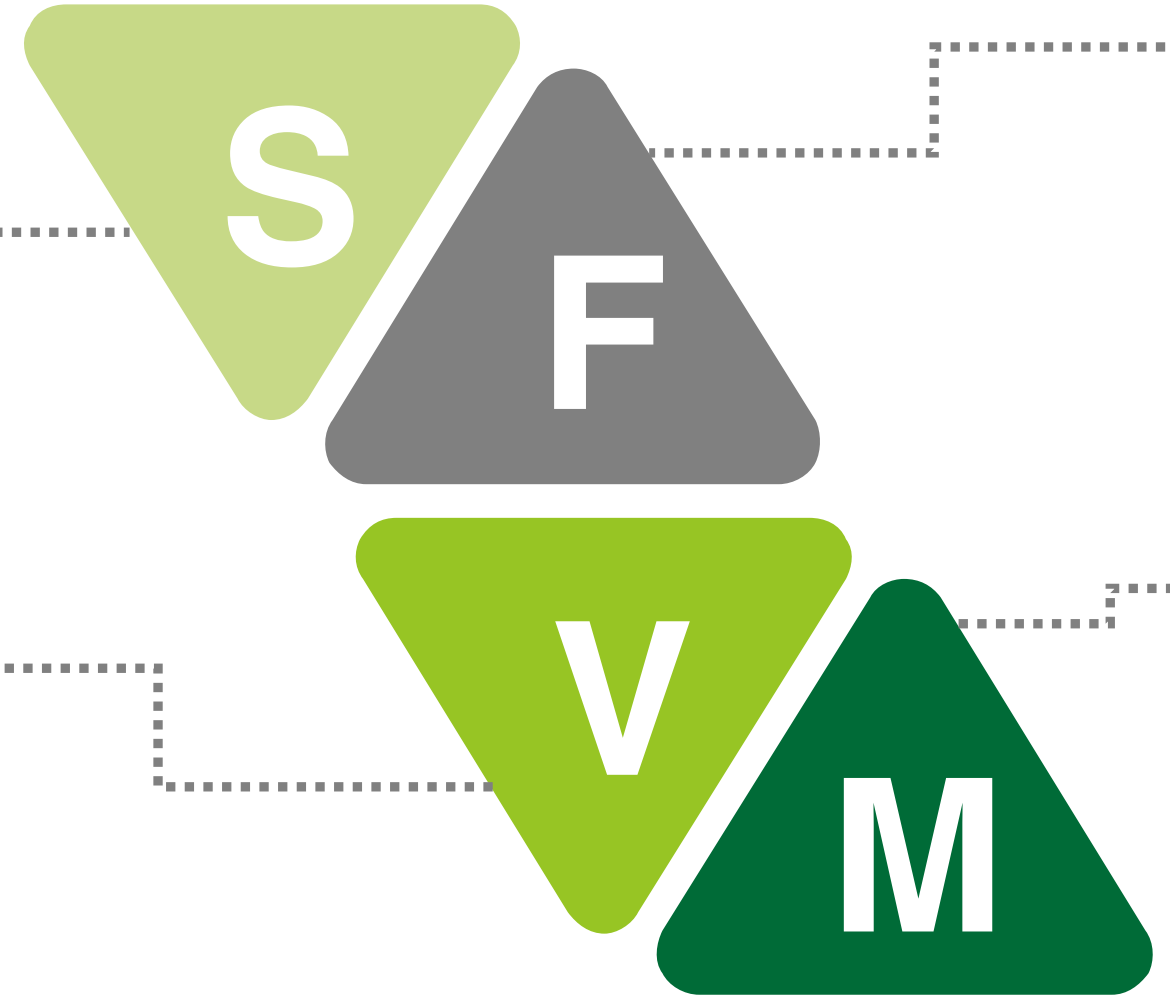
What is i-Tree Eco?

Structure

Tree species, canopy cover, leaf area, how trees are distributed across the landscape. From there the model uses this information to assess functions or the environmental services provide by trees.

Function

Carbon stored, stormwater intercepted or managed, air quality improvement, energy reduction. Then the model assigns value



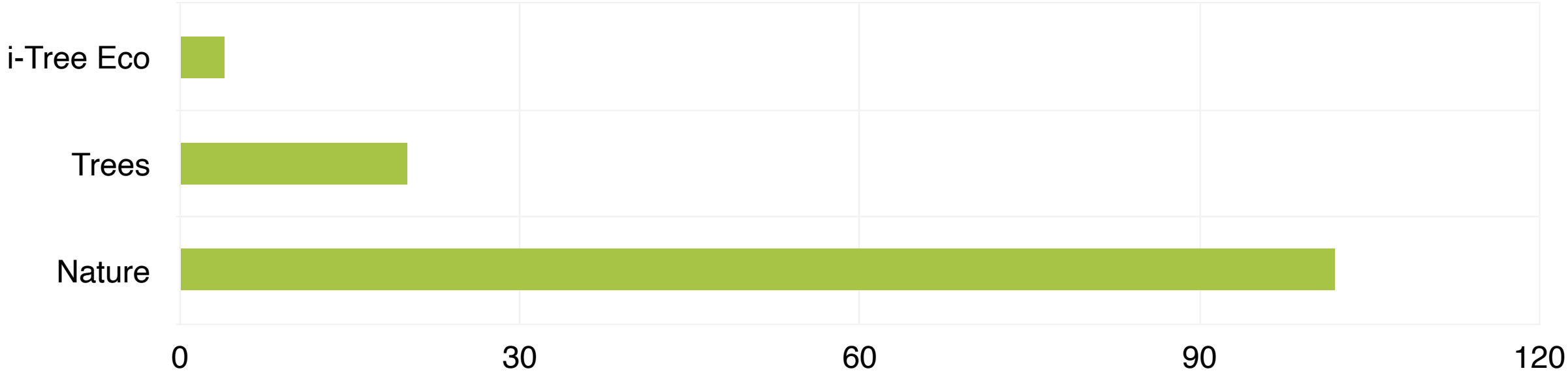
Value

i-Tree uses information from economic literature to monetize function. This can vary geographically within countries and will be different in different countries.

Management

How do you manipulate the structure to provide a better return on your investment? What species to plant, and where to plant them? Optimization of benefits to meet management objectives or serve people.

Ecosystemservices in i-Tree Eco



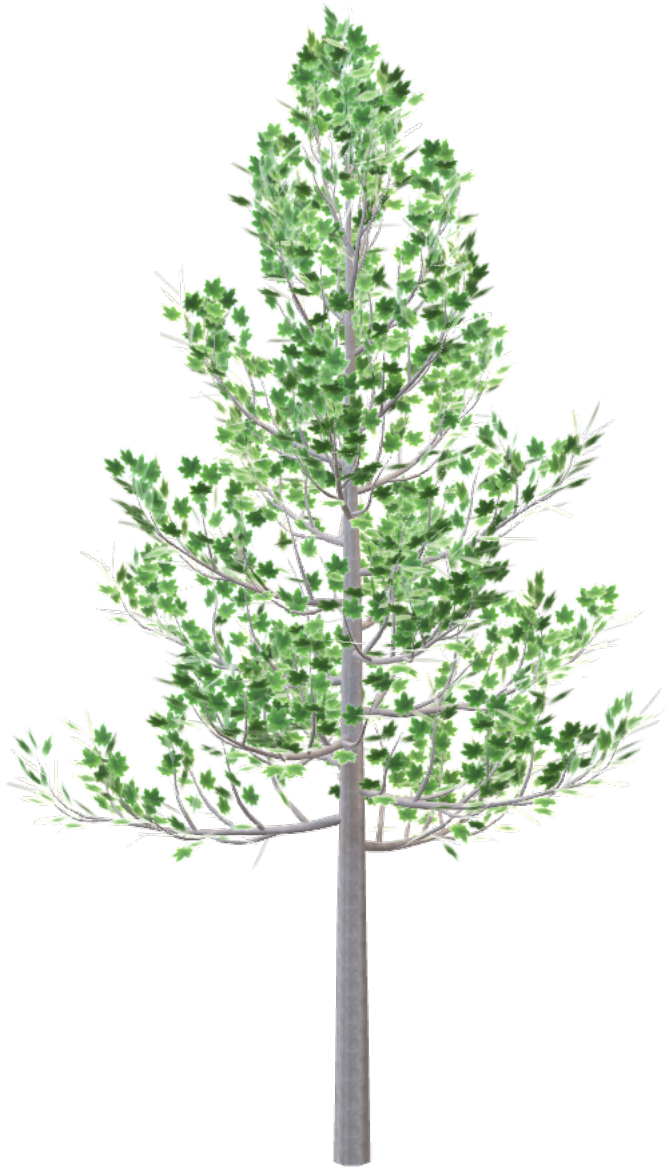
Nature: > 100 ecosystemservices

Trees: approximately 20 ecosystemservices

i-Tree calculates ‘only’ 4 ecosystemservices

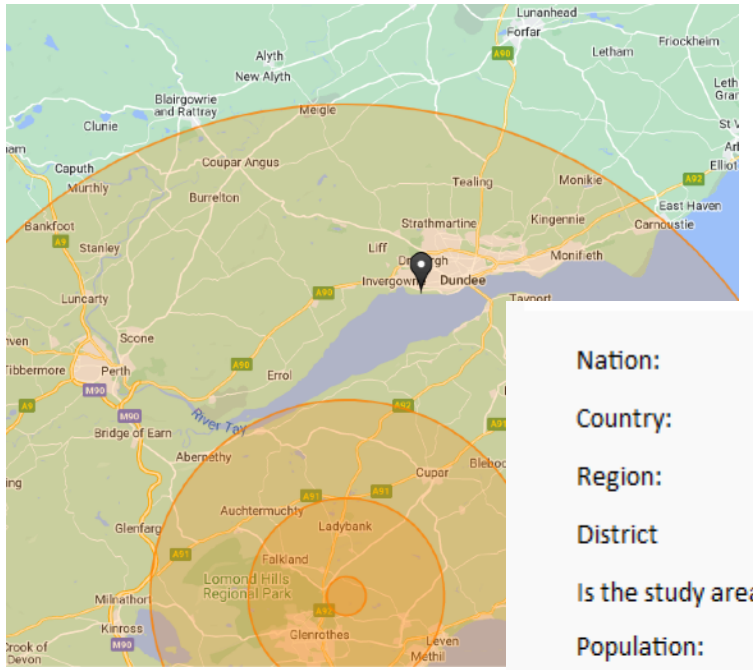
CICES: Common International Classification of Ecosystem Services

Calculated ecosystemservices in i-Tree Eco (adapted for Europe)



Air pollution removal	g/year
Carbon storage	kg
Carbon sequestration	kg/year
Avoided runoff	m3/year
Oxygen production	kg/year

Calculation based on specific data



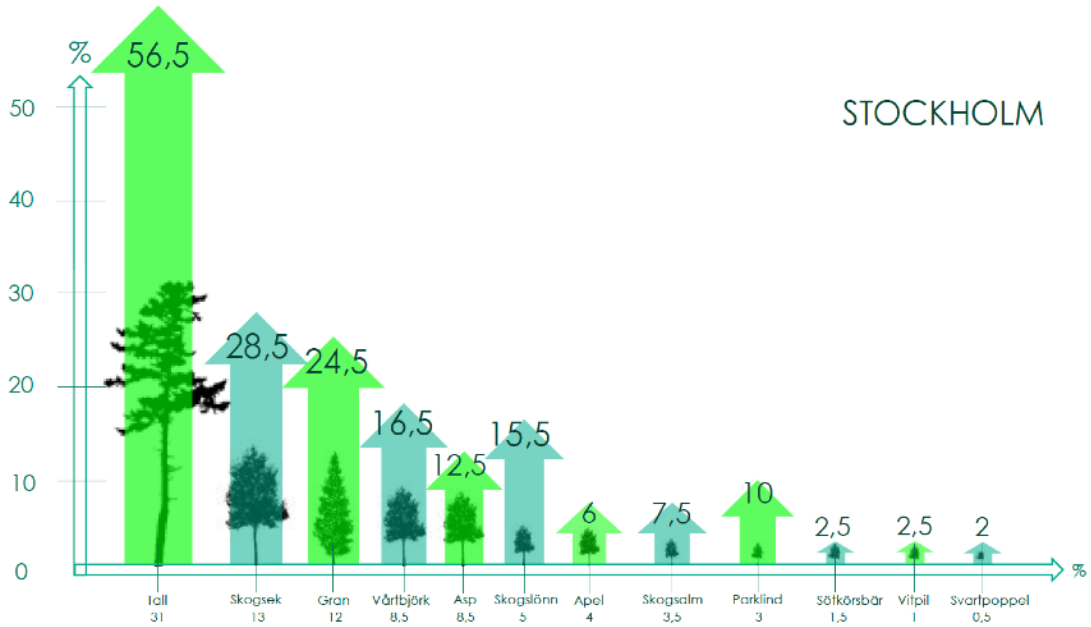
Nation:	United Kingdom
Country:	Scotland (Country)
Region:	South Scotland
District	Fife (District)
Is the study area Urban?	☑
Population:	149000
Population per km²:	2525

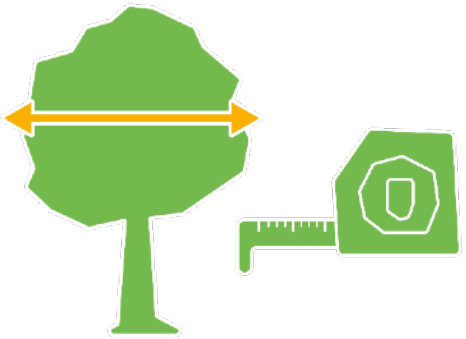
Please specify the following years for your project:

Weather & Pollution Year:	2021 (Weather only)

Please select a weather station to use for your project:

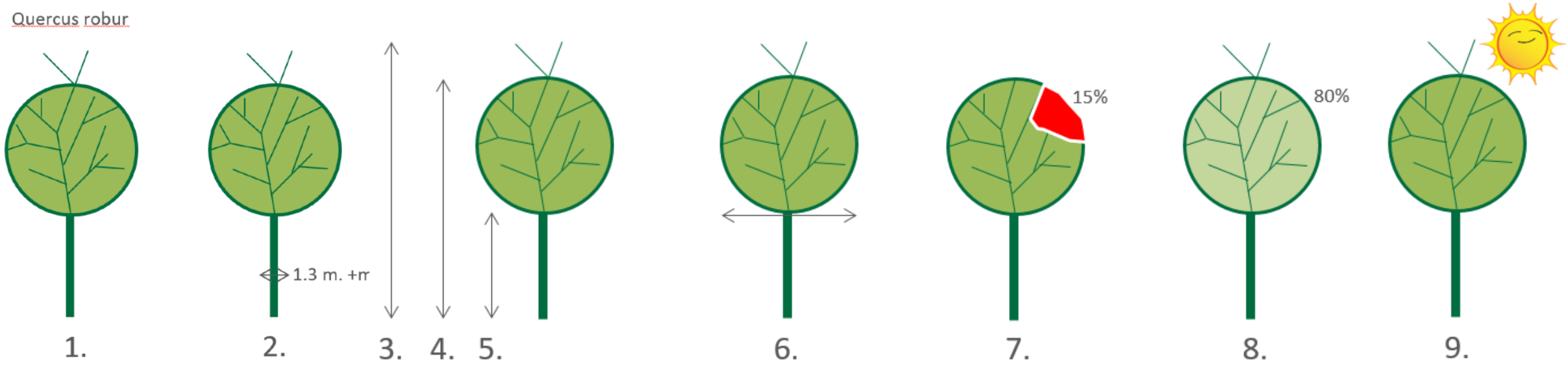
Weather Station:	031634-99999





i-Tree Eco - Data collection options

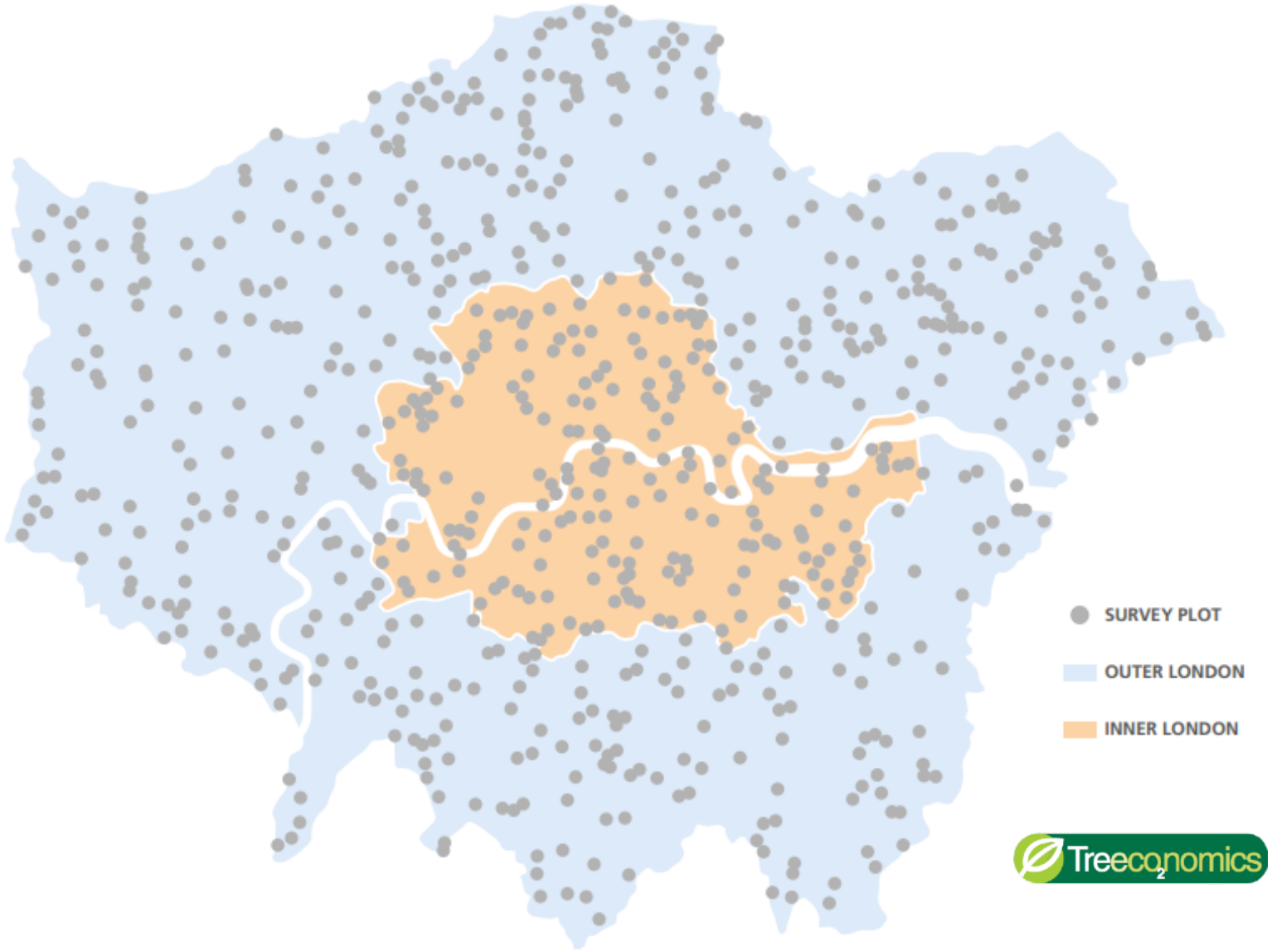
1. **Species**
2. **DBH**
3. Total tree height
4. Height of the living top
5. Height to crown base
6. Crown width (North-South and East-West)
7. Percentage crown missing
8. Crown health
9. Crown light exposure



i-Tree Eco - Full inventory

UID	f1	f6	DBH	aantal	soort	f11	f12	f13	f2	f6	f8	f9
12417	Abies alba	9 - 12 meter	25	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1986	9 - 12 meter	1 x per 3 jaar VTA (normaal)	N
24176	Abies alba	12 - 15 meter	31	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	12 - 15 meter	1 x per 3 jaar VTA (normaal)	N
11737	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1975	18 - 24 meter	1 x per jaar VTA (attentie)	N
11771	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1975	18 - 24 meter	1 x per jaar VTA (hoge gevaarzetting en boomgrootte)	N
12437	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1975	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
12749	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1975	18 - 24 meter	1 x per jaar VTA (hoge gevaarzetting en boomgrootte)	N
14658	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1975	18 - 24 meter	1 x per jaar VTA (attentie)	N
22731	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1970	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
23476	Abies grandis	18 - 24 meter	52	1		Niet ingevuld	Goed (10 - 25 jaar)	Particulier	1970	18 - 24 meter	Niet ingevuld	N
23614	Abies grandis	15 - 18 meter	41	1		Niet ingevuld	Goed (10 - 25 jaar)	Particulier	1980	15 - 18 meter	Niet ingevuld	N
24101	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1970	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
24105	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	15 - 18 meter	1 x per 3 jaar VTA (normaal)	N
24106	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	15 - 18 meter	1 x per 3 jaar VTA (normaal)	N
24107	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	15 - 18 meter	1 x per 3 jaar VTA (normaal)	N
24108	Abies grandis	12 - 15 meter	31	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1990	12 - 15 meter	1 x per 3 jaar VTA (normaal)	N
24113	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	15 - 18 meter	1 x per 3 jaar VTA (normaal)	N
24114	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	15 - 18 meter	1 x per 3 jaar VTA (normaal)	N
24117	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
24119	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
24121	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1986	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
24191	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1970	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
24378	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	15 - 18 meter	1 x per 3 jaar VTA (normaal)	N
24635	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1985	15 - 18 meter	1 x per jaar VTA (attentie)	N
24637	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1985	18 - 24 meter	1 x per jaar VTA (attentie)	N
24638	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1985	15 - 18 meter	1 x per jaar VTA (attentie)	N
24639	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1986	18 - 24 meter	1 x per jaar VTA (attentie)	N
24646	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Slecht (0 - 2 jaar)	Gemeente	1981	15 - 18 meter	1 x per jaar VTA (attentie)	N
24647	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1980	15 - 18 meter	1 x per jaar VTA (attentie)	N
24653	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1985	18 - 24 meter	1 x per jaar VTA (attentie)	N
25664	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1985	18 - 24 meter	1 x per jaar VTA (attentie)	N
25665	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1985	15 - 18 meter	1 x per jaar VTA (attentie)	N
25666	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1985	15 - 18 meter	1 x per jaar VTA (attentie)	N
28177	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Slecht (0 - 2 jaar)	Gemeente	1985	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
28178	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	0	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
28179	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	0	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
28234	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Voldoende (5 - 10 jaar)	Gemeente	1980	18 - 24 meter	1 x per 3 jaar VTA (normaal)	N
28607	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	0	18 - 24 meter	1 x per jaar VTA (attentie)	N
28608	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	0	18 - 24 meter	1 x per jaar VTA (attentie)	N
28610	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1980	15 - 18 meter	1 x per jaar VTA (attentie)	N
28611	Abies grandis	15 - 18 meter	41	1		Onderhoudssnoei 1 x / 4 jaar	Slecht (0 - 2 jaar)	Gemeente	1980	15 - 18 meter	1 x per jaar VTA (attentie)	N
28612	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Slecht (0 - 2 jaar)	Gemeente	1980	18 - 24 meter	1 x per jaar VTA (attentie)	N
28613	Abies grandis	12 - 15 meter	31	1		Onderhoudssnoei 1 x / 4 jaar	Matig (2 - 5 jaar)	Gemeente	1980	12 - 15 meter	1 x per jaar VTA (attentie)	N
28614	Abies grandis	18 - 24 meter	52	1		Onderhoudssnoei 1 x / 4 jaar	Goed (10 - 25 jaar)	Gemeente	1980	18 - 24 meter	1 x per jaar VTA (attentie)	N

i-Tree Eco - Plot study



URBAN TREES

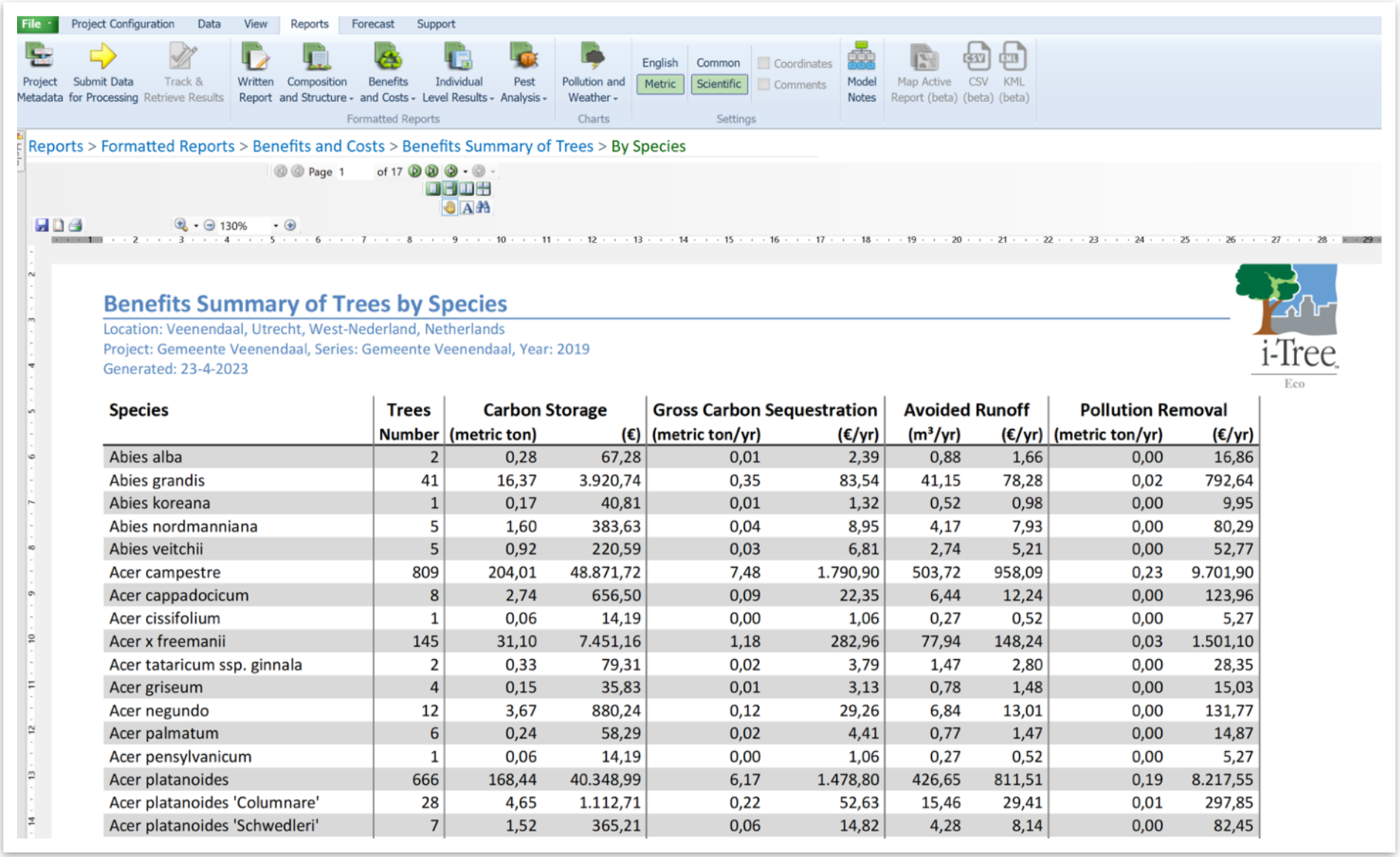
PRIVATE

PUBLIC

RESIDENTIAL

NON-RESIDENTIAL

i-Tree Eco - reports



Benefits Summary of Trees by Species

Location: Veenendaal, Utrecht, West-Nederland, Netherlands
Project: Gemeente Veenendaal, Series: Gemeente Veenendaal, Year: 2019
Generated: 23-4-2023

i-Tree Eco

Species	Trees	Carbon Storage		Gross Carbon Sequestration		Avoided Runoff		Pollution Removal	
	Number	(metric ton)	(€)	(metric ton/yr)	(€/yr)	(m³/yr)	(€/yr)	(metric ton/yr)	(€/yr)
Abies alba	2	0,28	67,28	0,01	2,39	0,88	1,66	0,00	16,86
Abies grandis	41	16,37	3.920,74	0,35	83,54	41,15	78,28	0,02	792,64
Abies koreana	1	0,17	40,81	0,01	1,32	0,52	0,98	0,00	9,95
Abies nordmanniana	5	1,60	383,63	0,04	8,95	4,17	7,93	0,00	80,29
Abies veitchii	5	0,92	220,59	0,03	6,81	2,74	5,21	0,00	52,77
Acer campestre	809	204,01	48.871,72	7,48	1.790,90	503,72	958,09	0,23	9.701,90
Acer cappadocicum	8	2,74	656,50	0,09	22,35	6,44	12,24	0,00	123,96
Acer cissifolium	1	0,06	14,19	0,00	1,06	0,27	0,52	0,00	5,27
Acer x freemanii	145	31,10	7.451,16	1,18	282,96	77,94	148,24	0,03	1.501,10
Acer tataricum ssp. ginnala	2	0,33	79,31	0,02	3,79	1,47	2,80	0,00	28,35
Acer griseum	4	0,15	35,83	0,01	3,13	0,78	1,48	0,00	15,03
Acer negundo	12	3,67	880,24	0,12	29,26	6,84	13,01	0,00	131,77
Acer palmatum	6	0,24	58,29	0,02	4,41	0,77	1,47	0,00	14,87
Acer pensylvanicum	1	0,06	14,19	0,00	1,06	0,27	0,52	0,00	5,27
Acer platanoides	666	168,44	40.348,99	6,17	1.478,80	426,65	811,51	0,19	8.217,55
Acer platanoides 'Columnare'	28	4,65	1.112,71	0,22	52,63	15,46	29,41	0,01	297,85
Acer platanoides 'Schwedleri'	7	1,52	365,21	0,06	14,82	4,28	8,14	0,00	82,45

Benefits Summary of Trees
- By Species
- By Stratum and Species

Carbon Storage of Trees
- By Species
- By Stratum

Annual Carbon Sequestration of Trees
- By Species
- By Stratum

Hydrology Effects of Trees
- By Species
- By Stratum

Oxygen Production of Trees
- By Stratum

Pollution Removal by Trees and Shrubs
- Monthly Removal
- Monthly Removal (chart display)

VOC Emissions of Trees
- By Species
- By Stratum

Allergy Index of Trees
- By Stratum

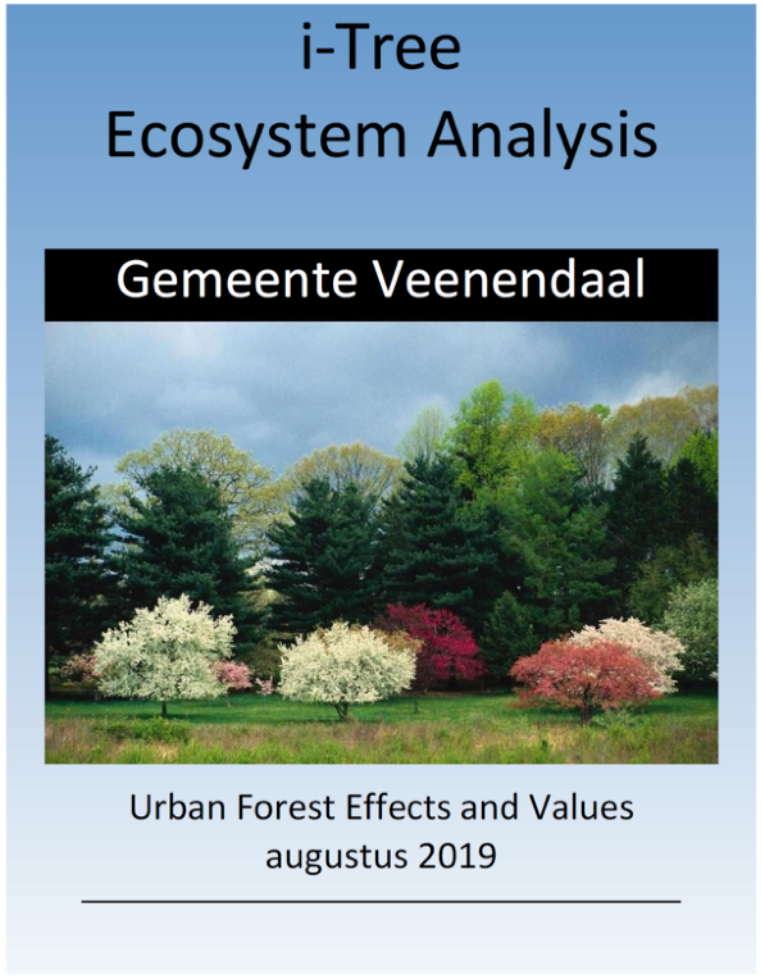
Management Costs
- By Expenditure

Net Annual Benefits
- Net Annual Benefits for All Trees

Foodscape Benefits of Trees
- By Species

Leaf Nutrients of Trees
- By Species

i-Tree Eco – Written report



Summary

Understanding an urban forest's structure, function and value can promote management decisions that will improve human health and environmental quality. An assessment of the vegetation structure, function, and value of the Gemeente Veenendaal urban forest was conducted during 2019. Data from 30016 trees located throughout Gemeente Veenendaal were analyzed using the i-Tree Eco model developed by the U.S. Forest Service, Northern Research Station.

- Number of trees: 30.016
- Tree Cover: 138,9 hectares
- Most common species of trees: English oak, European ash, European alder
- Percentage of trees less than 6" (15.2 cm) diameter: 7,6%
- Pollution Removal: 6,45 metric tons/year (€320 thousand/year)
- Carbon Storage: 10,12 thousand metric tons (€2,43 million)
- Carbon Sequestration: 340,8 metric tons (€81,6 thousand/year)
- Oxygen Production: 908,7 metric tons/year
- Avoided Runoff: 17,02 thousand cubic meters/year (€32,4 thousand/year)
- Building energy savings: N/A – data not collected
- Avoided carbon emissions: N/A – data not collected
- Structural values: €57,2 million

Metric ton: 1000 kilograms
Monetary values € are reported in euros throughout the report except where noted.
Ecosystem service estimates are reported for trees.

For an overview of i-Tree Eco methodology, see Appendix I. Data collection quality is determ
collectors, over which i-Tree has no control.

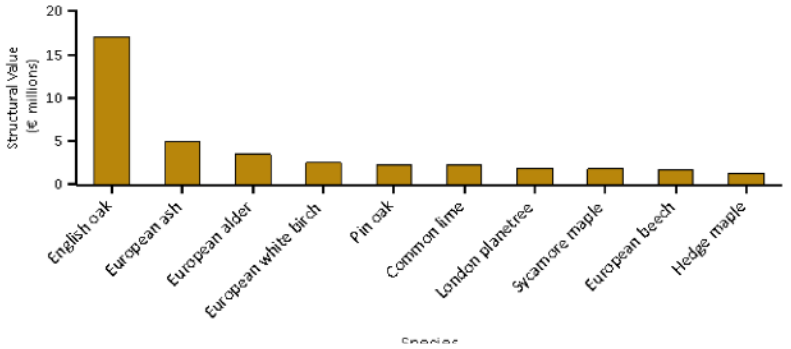
Urban trees in Gemeente Veenendaal have the following structural values:

- Structural value: €57,2 million
- Carbon storage: €2,43 million

Urban trees in Gemeente Veenendaal have the following annual functional values:

- Carbon sequestration: €81,6 thousand
- Avoided runoff: €32,4 thousand
- Pollution removal: €320 thousand
- Energy costs and carbon emission values: €0

(Note: negative value indicates increased energy cost and carbon emission value)



i-Tree Projects in Europe

London i-Tree project (2015) – London (UK)

VALUING LONDON'S URBAN FOREST

Results of the London i-Tree Eco Project

London i-Tree project – involved organisations and volunteers

Unilever brightFuture

DAVEY Proven Solutions for a Growing World

THE TREE COUNCIL

Trees for Cities

LONDON TREE OFFICERS ASSOCIATION

NATURAL ENGLAND

Forestry Commission England

Treeconomics

GiGL

SUPPORTED BY MAYOR OF LONDON

Forest Research

And most importantly all the volunteers:

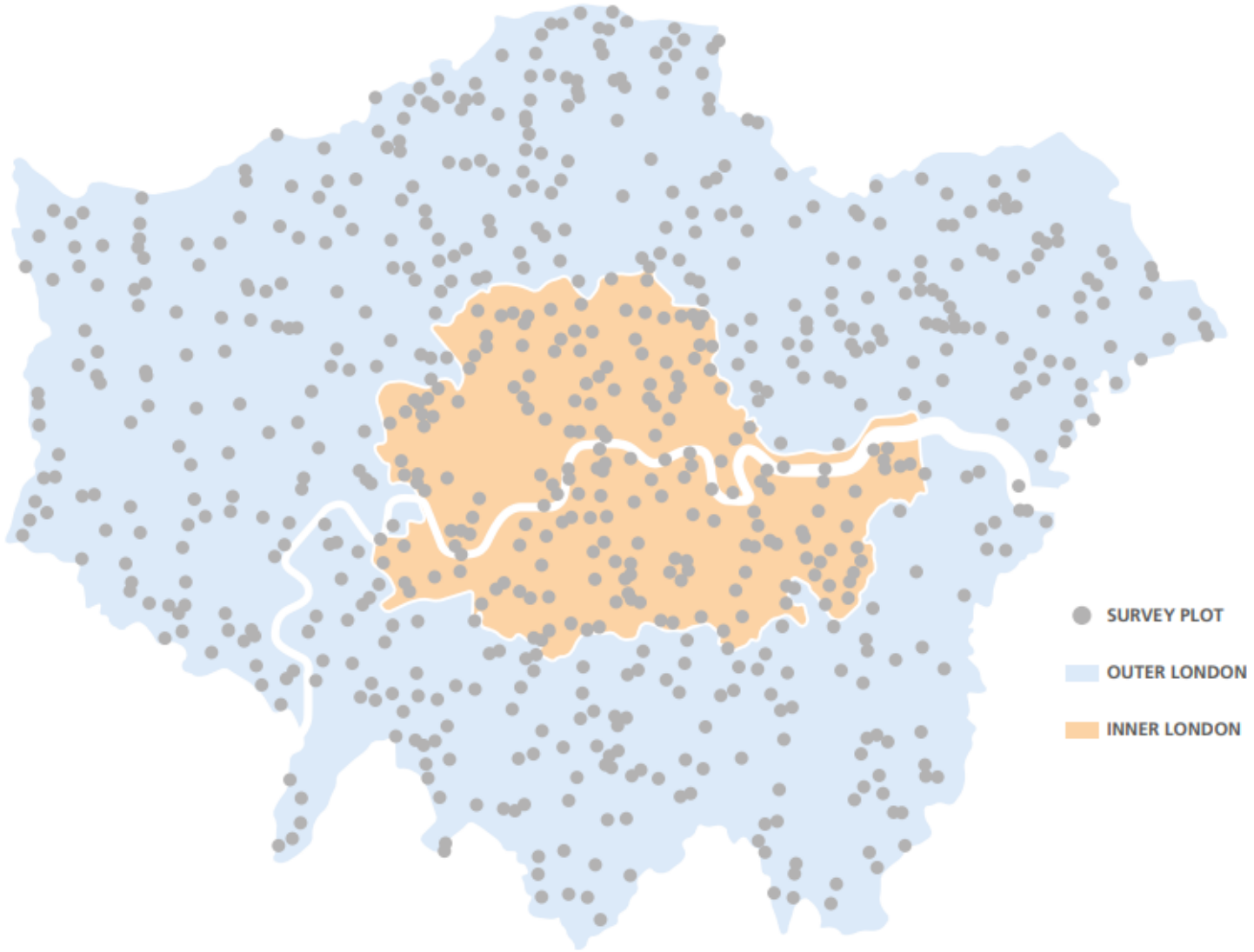
Alan Williams
Alex Fraser
Alex van der Nelson
Alexandra Clark
Alice Pearson
Alison Ellis
Alison Sweeney
Amy Hammond
Amy Whetstone
Andrew Digby
Andrew Hayashi
Andrew Williams
Andy Bryce
Andy Lederer
Angela Wilkinson
Anita Sedgewick
Ann Watcyn Pugh
Anna Marie Yassin
Anna Suska
Annabel Downs
Anne Horsburgh
Anne Queree
Anne Watson
Annie Chipchase
Anona Potts
Bea Ayling
Ben Morgan
Benjamin Brace
Benson McDowell
Carly Fretwell
Carol Johnston
Caroline Cupitt
Caroline Ford
Caroline Staines
Carolyn Serter
Catherine Airlie
Catherine Collingborn
Charles Snead
Cheryl Pilbeam
Chris Colwell
Chris Setz
Chris Sheldon
Christine Talmage
Christopher Angell
Clive Kershaw
Colin Bradley
Colleen O'Sullivan
Daisy Cairns
Daniel Goode
Daniel Simmons
Daniel Sitch
Daniel Belucci
Dave Wright
David Baxter
David Bernstein
David Humphries
David Hutchens
David Mercer
David Wheatley
Derek Hyatt
Diego Avesani
Duncan Goodwin
Éadaoin Ni Fheargháil
Ed Fuller,
Eleanor Glen
Erin Gianferrara
Fabiola Cedillo
Fiona Moore
Francesca Estrada
Francesco Dimitri
Gemma Harris
George Flucknett
George Raszka
Giedre Paliukaityte
Gillian Brown
Ginny Page
Gloria George
Graham Tennant
Guy Meilleur
Guy Whiteley,
Guzen Tuna
Hannah Clay
Harriet Ibbett
Harriet O'Brien
Harry Studholme
Helena Wright
Henry Jeffries
Hilary Burden
Hilary Friend
Holly Smith
Ian Mackean
Iris Yau
Isabel Wreford
Isabella Mees
Jackie Melsom
Jane Houghton
Jane Plant & Peter Fischer
Jane Rutt & Brigid Crookes
Jane Swann White
Janice Fraser
Jennifer Blain,
Jennifer Hegarty
Jenny Schofield
James Watson
Jessica Beattie
Jill Barrett
Joanna Bazley
Joe Woodcock
John Ashwell
John Eborall
John Matthews
John Medhurst
John Roscoe
Jon Heuch
Jonathan Dean
Jonathan Meares
Joy Lee
Jude Hassall
Juliet Cairns
Juliet Hobday
Kate Harvey
Kate Williams
Katrina Fellerman
Katy Andrews
Kelly King,
Kelvin Shewry
Kieron Hardie
Kirsty Myron
Laura Gardner
Laura Pritchard
Lazer Woolf,
Leigh Terrafranca
Liz Goumas
Liz Sherwood
Lorraine Chatfield
Luke Hawke
Marcelo Novillo
Martin Anderson
Martin Smith
Matthew Hird
Matthew Payne
Meike Weiser,
Millie Toft
Morag Carmicheal
Nadia Ward
Nancy Fulford
Nick Harrison
Nicola Wheeler,
Oliver Tong
Pam Fawcett
Paul Barton
Paola Filotico
Pat Gardiner
Pat Langley
Patrica Knight
Peter Fischer
Pherenice Worsey-Buck
Polly Turton
Poppy Lakeman-Fraser
Rachel Carlill
Richard Edwards
Richard Ince
Robert Butcher
Robert Goode
Robert Shilston
Robin Middleton
Rosabel Richards
Rose Ades
Rosie Pope
Rupert Bentley-Walls
Russell Ball
Russell Miller
Saima Raza
Sally Harries
Samantha Davenport
Sarah Milliken
Sarah Riddlestone
Sarah Ward
Sean Courtman
Shaun Kiddell
Si Braybrooke,
Simon Ffoulkes
Sonu Agarwal
Sophie Da Costa
Stephen Downing
Stephen Middleton,
Stephen Whittle
Susanna Ferrar
Susanne Raum
Suzanne Flanagan Corke
Tamsin Bacchus
Tasha Hunter
Theresa Ball
Thomas Campbell
Tom Moulton
Tom Roser
Victoria Perez Diaz
Vincenzo De Lacovo
Yas Andrauf
Zaria Greenhill

Volunteers Perspective

"When I heard about the London-wide i-Tree survey, I jumped at the chance to volunteer. As a Londoner, I am well aware of the importance and value of London's trees and wanted to be a part of the project that would quantify that value."

Laura Gardner
i-Tree volunteer team leader

London i-Tree project – plot study



London i-Tree project – summary

i-Tree

VALUING LONDON'S URBAN FOREST

Results of the London i-Tree Eco Project

Summary

The London i-Tree Project involved hundreds of volunteers conducting the largest city tree survey of its kind in the world in 2014. Using the information collected, the quantity and value of some of the benefits that London's trees and woodland provide were calculated, referred to as ecosystem services.

The benefits measured include air pollution removal, reduction of storm water run-off and carbon sequestration.

This leaflet provides just some of the headline information and key messages. For further information – including a breakdown of the trees and associated benefits for both inner and outer London - download the full report "Valuing London's Urban Forest" from www.urbantreecover.org/location/london

London's trees provide at least £133M of benefits every year in terms of air pollution removal, carbon sequestration and reducing the amount of water going into drains.

60%

Almost 60% of London's trees are in private ownership, but the trees on public land contribute 60% of the ecosystem service benefits. This is because parks and green spaces have a higher proportion of larger trees

2241

tonnes of pollution removed from the air every year, worth £126M. They remove the equivalent of 13% of PM10 particulates and 14% of NO_2 emitted by road transport

40%

Nearly 40% of London's surface is impermeable; 32% of ground cover is grass

Pests and diseases – Asian Longhorn Beetle, if it established itself in London, could damage over 3 million of London's trees leading to a reduction in ecosystem services and associated economic cost.

Biodiversity – London's trees support and are closely associated with a wide range of priority species such as all bat species, birds like barn owl, butterflies like purple emperor, other insects like stag beetle, and fungi like oak polypore.

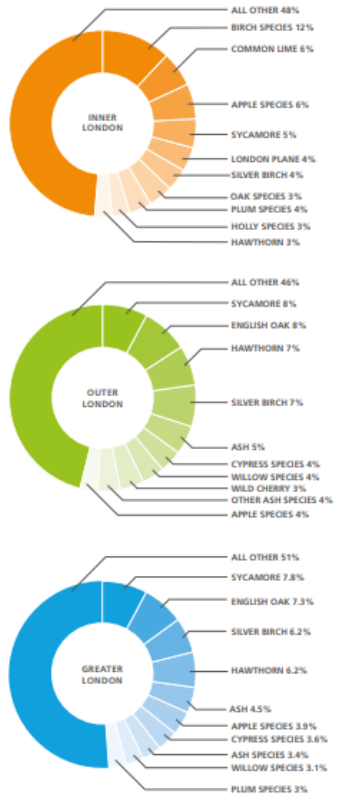
2,367,000

tonnes of carbon is stored in London's trees, worth £147M

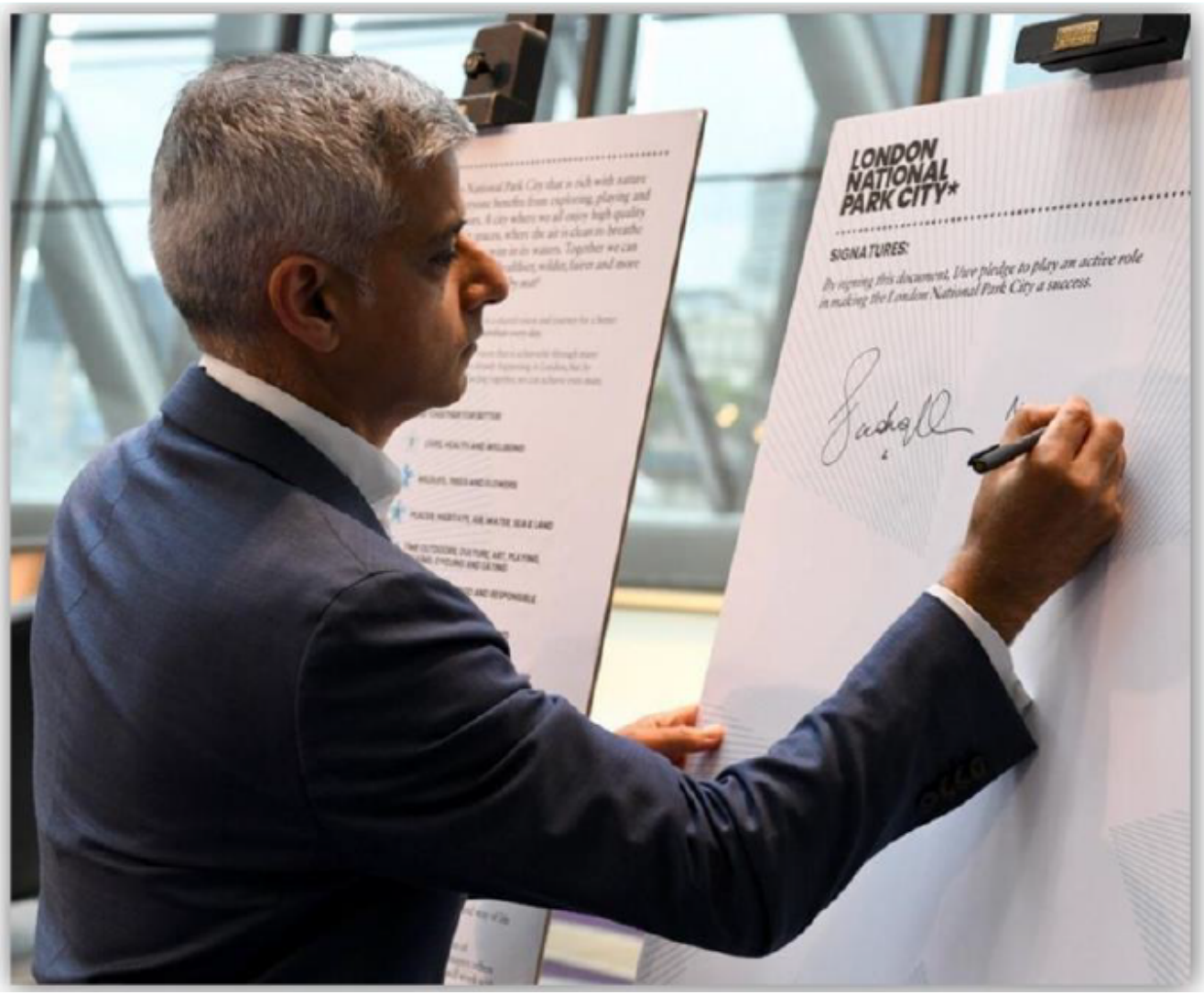
Trees prevent 10x

the volume of water in the Serpentine from entering London's drainage system. This helps reduce the risk of localised flooding.

There are **8.4M** trees in London

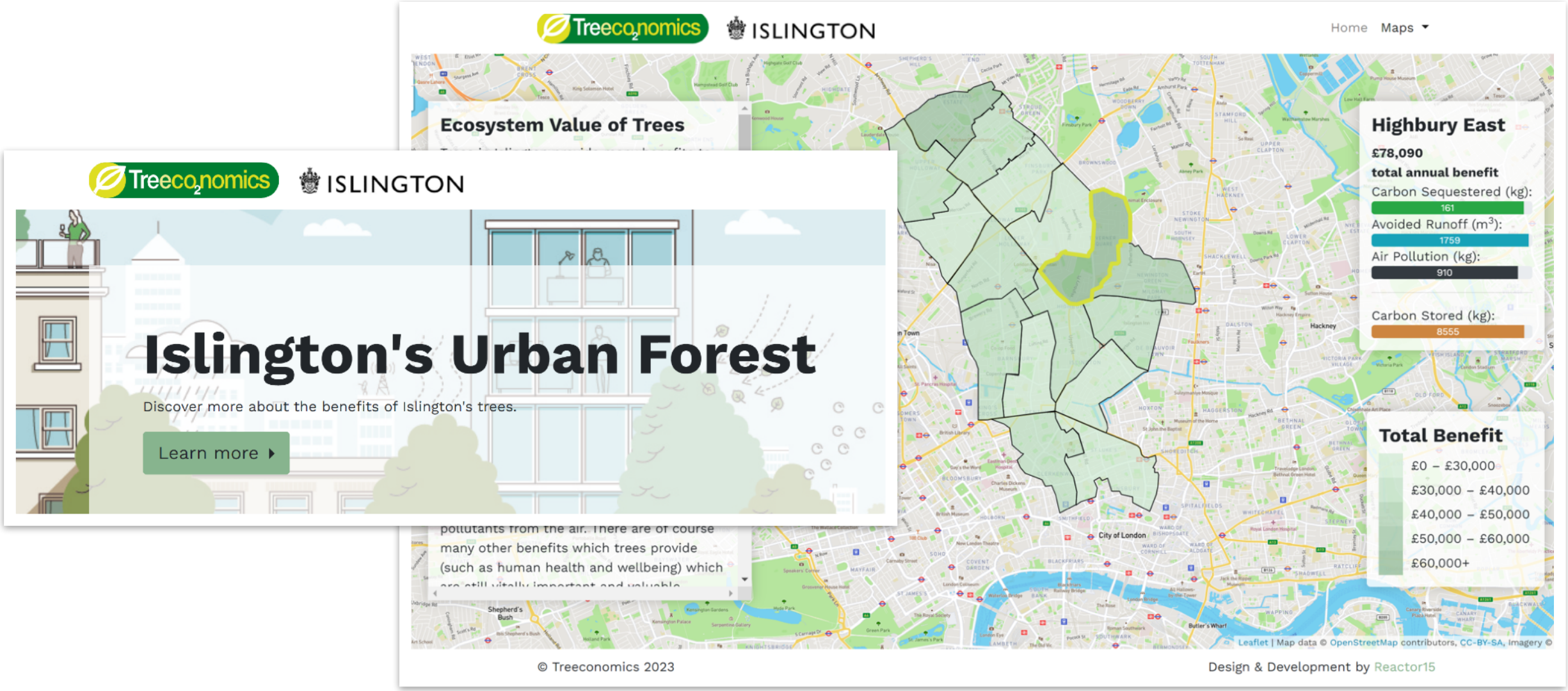


London i-Tree project – argumentation for London National Park City



LONDON NATIONAL PARK CITY*

London i-Tree project – Islington's Urban Forest



Islington council plants its 700th tree this year

By **Isabella McCrone** - 24th March 2022

Vind ik leuk 7 Tweet

Islington's urban forest project gets cash injection

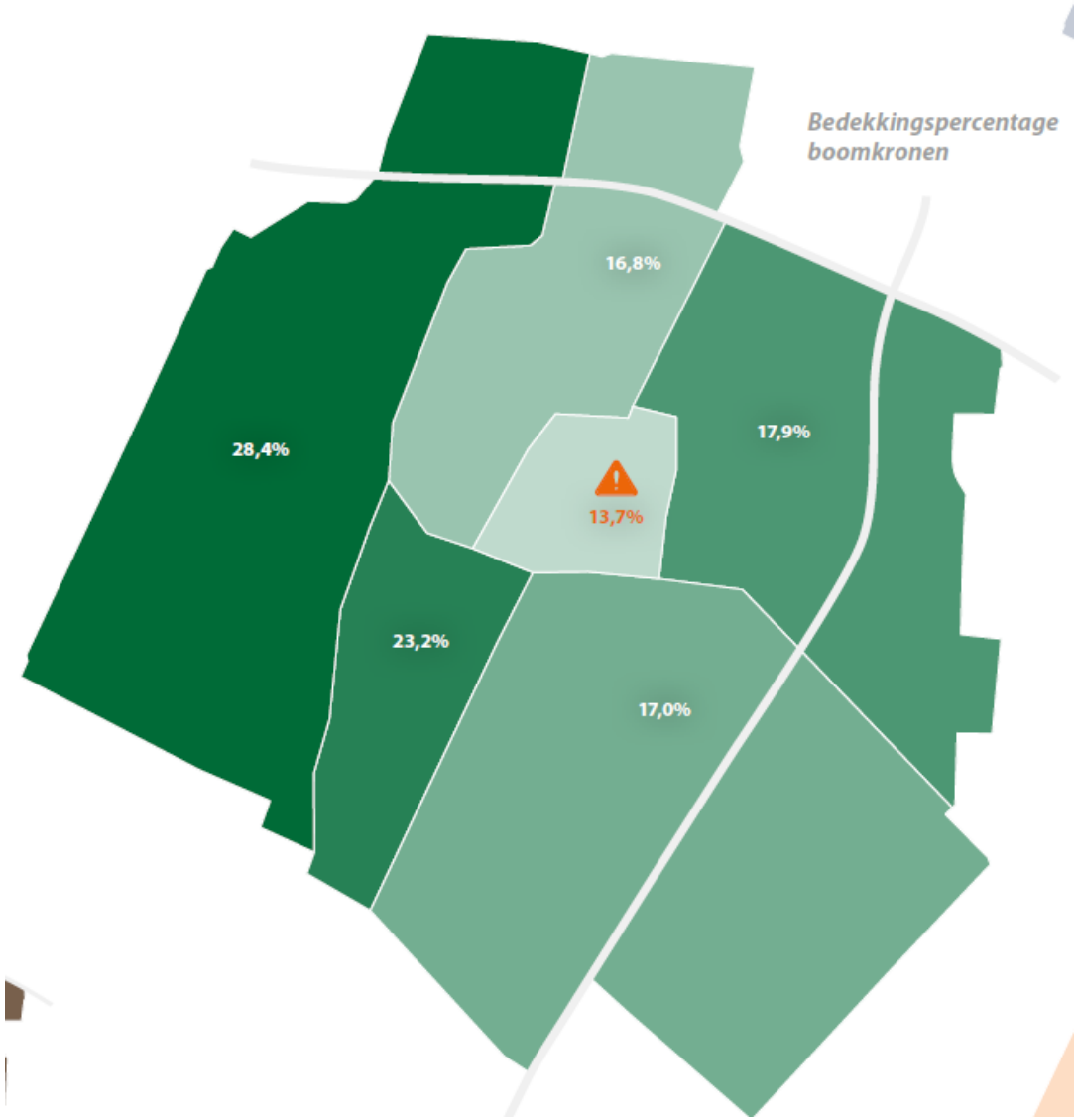
By Julia Gregory, Local Democracy Reporter | Thursday 16 September 2021

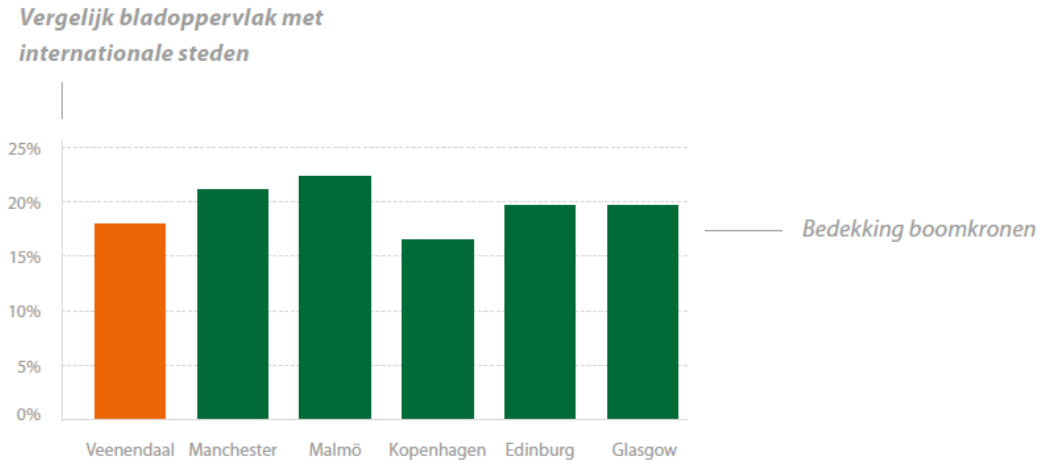
The Car-Free Open Space will become a mini-woodland named Islington Forest for Change. Photograph: Islington Clean Air Parents

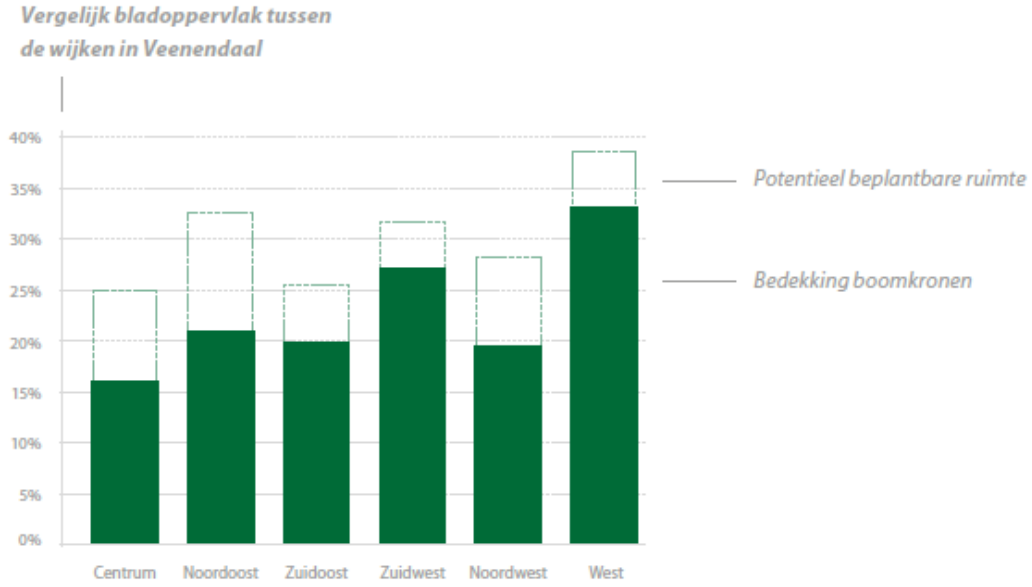
Veenendaal Canopy Study – Veenendaal (NL)

- i-Tree Canopy study 6 boroughs
- > 500 measurement points per borough
- Categories:
  - Tree
  - No Tree
  - Potential planting space

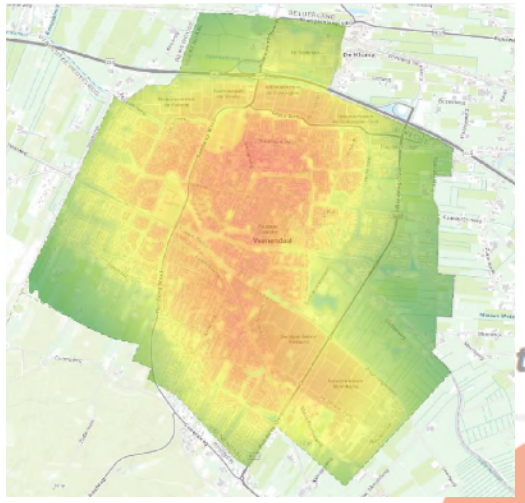
Veenendaal Canopy Study – results

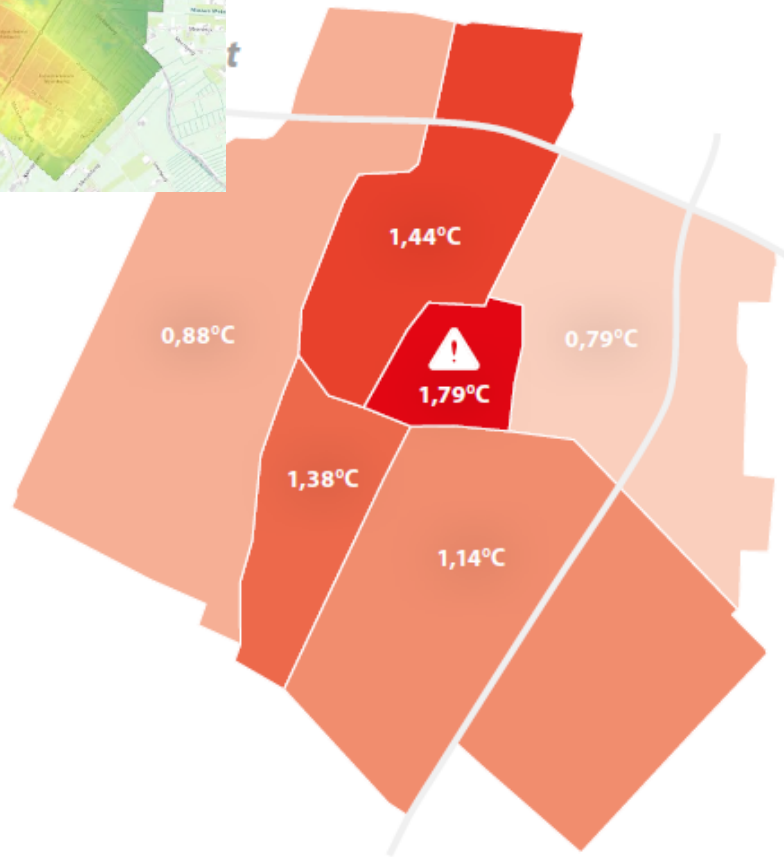


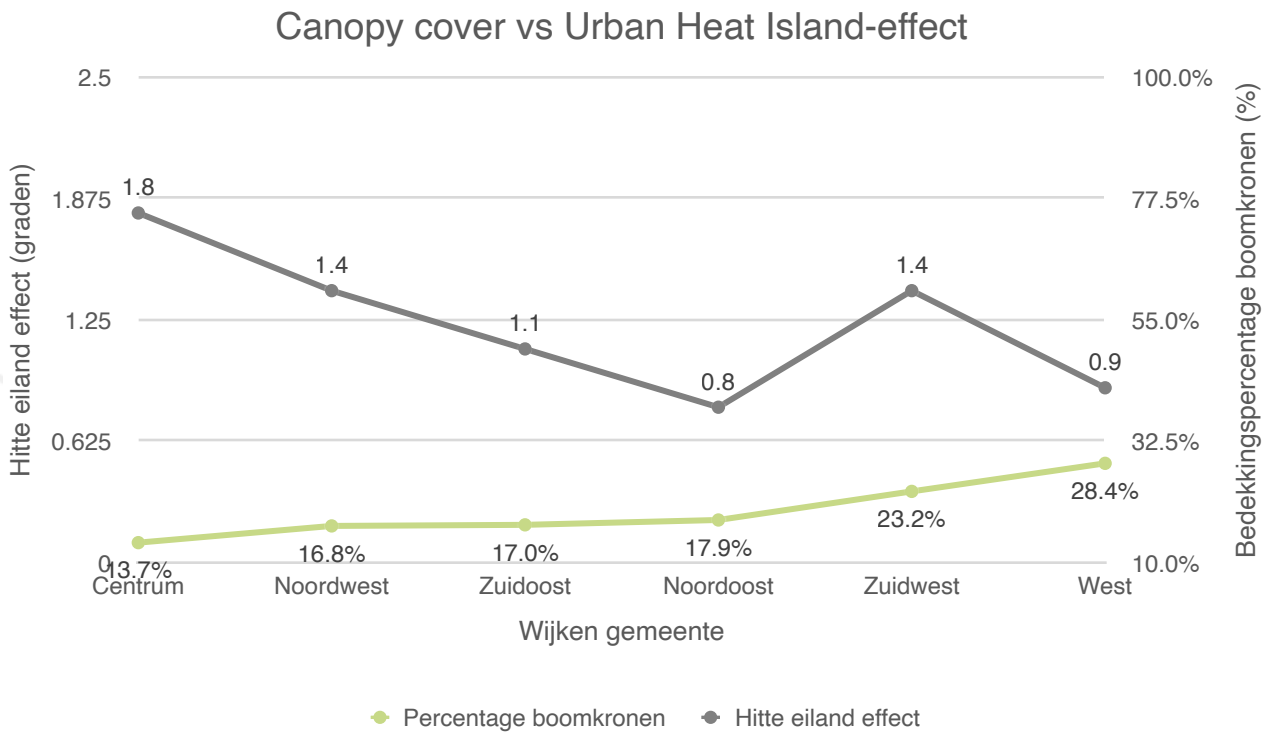




Veenendaal Canopy Study – compare data with societal challenges

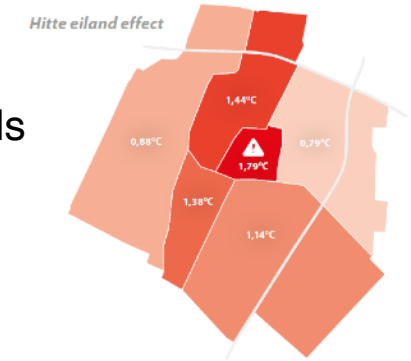




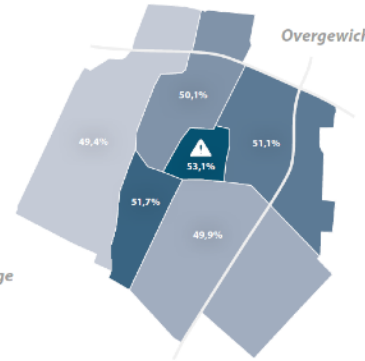


Veenendaal Canopy Study – focus: where do we need trees the most?

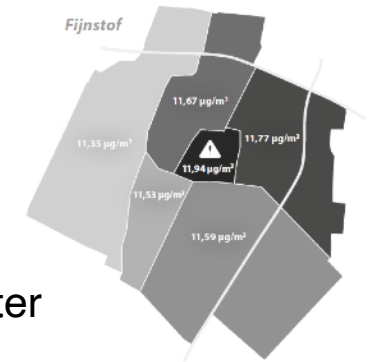
Urban Heat Islands

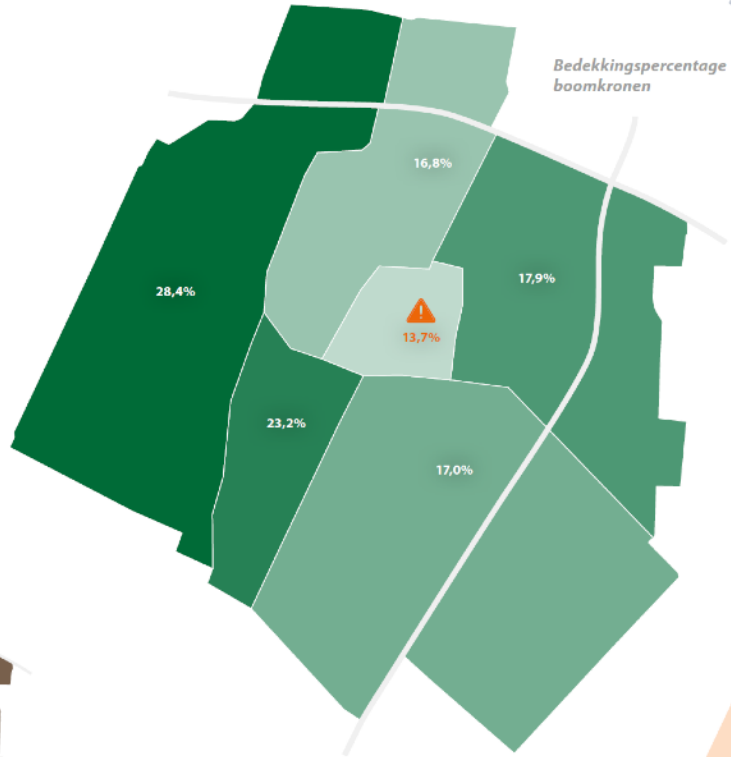


Overweight

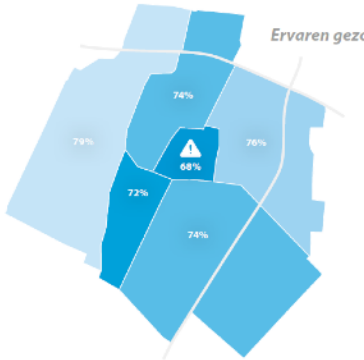


Particulate matter

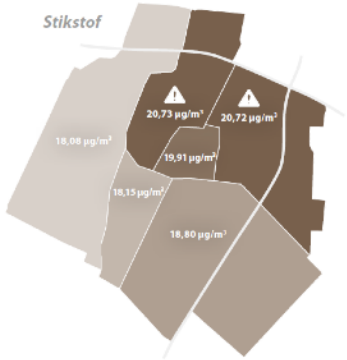




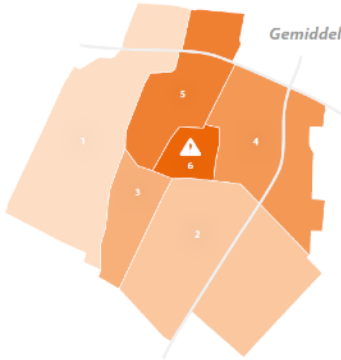
Perceived health



Nitrogen emissions

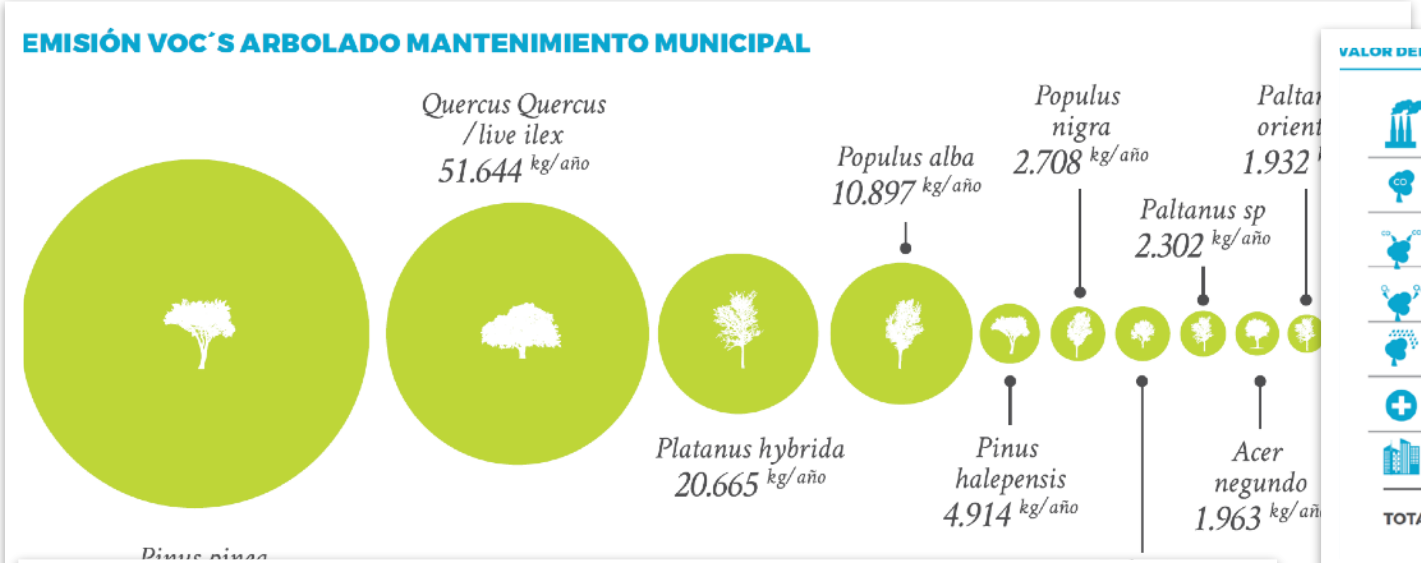


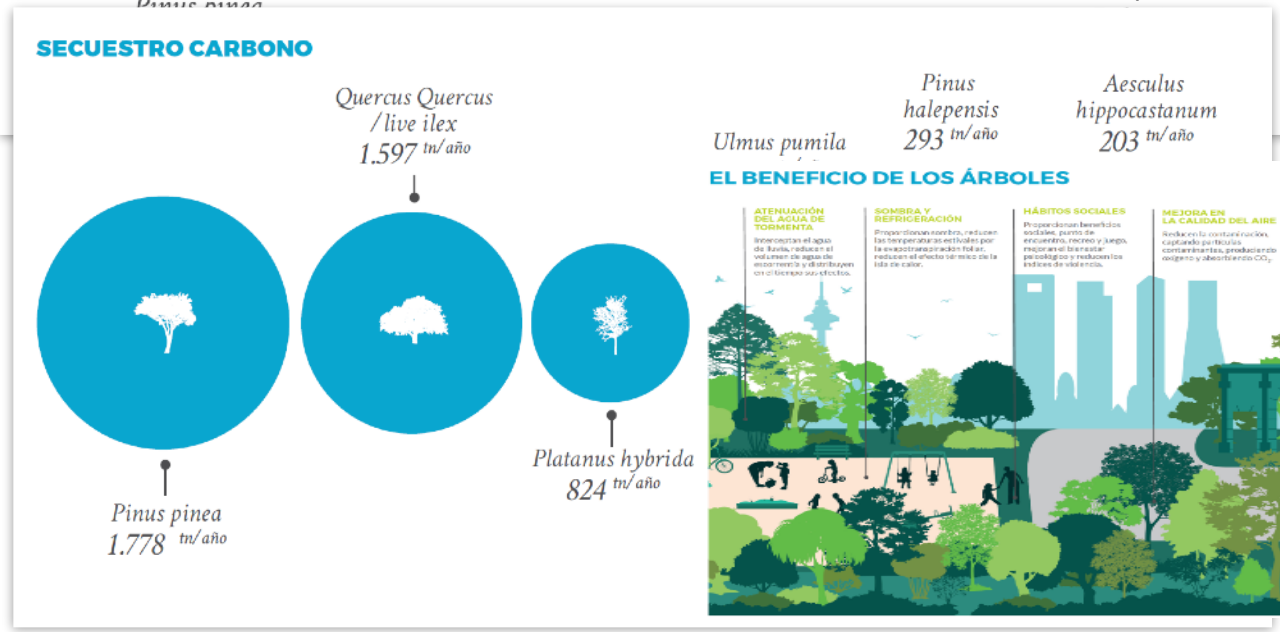
Average ‘score’ societal challenges



Valor del bosque urbano de Madrid – Madrid (ES)

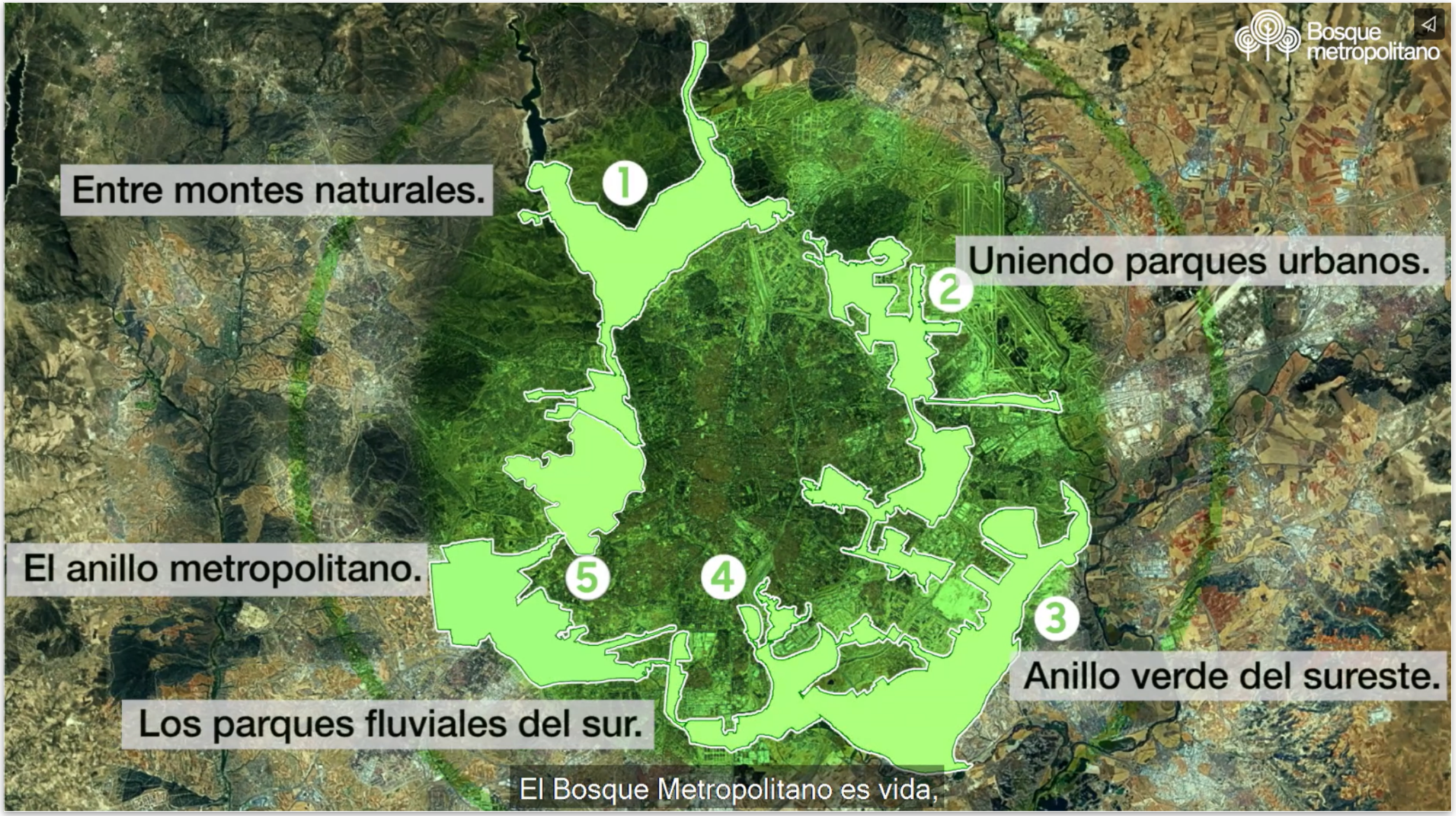
Valor del bosque urbano de Madrid – results





https://bosquemetropolitano.madrid.es/

Valor del bosque urbano de Madrid – Bosque Metropolitano



https://bosquemetropolitano.madrid.es/

Valor del bosque urbano de Madrid – Bosque Metropolitano publicity film

https://bosquemetropolitano.madrid.es/

The return of i-Tree in Torbay – Torbay (UK)

The return of i-Tree in Torbay – comparison structure

Structure and Composition Headline Figures

	2022 Study			2010 Study
Number of Trees (estimate)	459,000			692,000
Tree Density (trees/hectare)	71			109
Tree Canopy Cover	18.2%			11.8%
Shrub Cover	10.8%			6.4%
Other Green Infrastructure Cover	48.8%			-
Seagrass Cover	52.2 ha			-
Most Common Tree Species	*Fraxinus excelcior* 14.1%	*Acer pseudoplatanus* 10.8%	*Corylus avellana* 7.6%	*Cuprocyapris leylandii*, *Fraxinus excelcior*, *Acer pseudoplatanus*
Most Common Tree Genera	*Fraxinus* 18.1%	*Acer* 12.0%	*Quercus* 11.4%	-
Replacement Cost (CTLA)	£306 million			£280 million
Amenity Valuation (CAVAT)	£4.1 billion			-
Recreational Valuation (ORVal)	£44.5 million			-

The return of i-Tree in Torbay – comparison ecosystem services

Ecosystem Services Provided by Trees Compared

	2010		2022		Difference
	Amount	Value	Amount	Value	
Carbon Storage (whole value)	154,000 tonnes	£140,000,000	172,000 tonnes	£156,000,000	18,000 tonnes ↑
Annual Carbon Sequestration	5,680 tonnes	£5,170,000	4,910 tonnes	£4,470,000	-770 tonnes ↓
Annual Pollution Removal	57 tonnes	£1,300,000	67 tonnes	£1,210,000	10 tonnes ↑
Annual Avoided Runoff	158,000 m^3	£520,000	195,000 m^3	£643,000	37,000 m^3 ↑

The return of i-Tree in Torbay – extra budget planting trees

TORBAY.GOV.UK

Sign up to

Local elections 2023 Local elections will be held in Torbay on Thursday 4 May 2023 for all wards.

> Planning and Building Control > Trees > Tree planting

Tree planting

Find out about our tree planting programme which forms a key part of our commitment to tackling the climate emergency.

As part of our ongoing commitment to tackling climate change and
sites across the bay.

Benefits of tree planting include:

- Improving air quality
- helping keep our homes cool
- provide timber, wood and fibre products
- offer opportunities for people to reconnect with nature
- provide spaces to improve health and wellbeing
- help to reduce flood risk
- reduce the costs of water treatment

Ash Dieback: Thousands of trees planted in Torbay to replace those that died from disease

The Council and Hi-Line have worked together to plant new trees in the wake of Ash Dieback disease.

This latest planting follows the recent publication of the new i-Tree report which compared Torbay's tree canopy today with a similar study done in 2010. The report found that while the number of trees in the Bay had reduced, the actual tree canopy cover was higher than in 2010 (it had increased from 11.8% in 2010, to 18.2% in 2021), and the amount of carbon stored by trees has similarly risen.

i-Tree Sverige project – Sweden

i-Tree Sverige

För strategiskt arbete med träds ekosystemtjänster

SLU Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences
Fakulteten för landskapsarkitektur, trädgårds– och växtproduktionsvetenskap

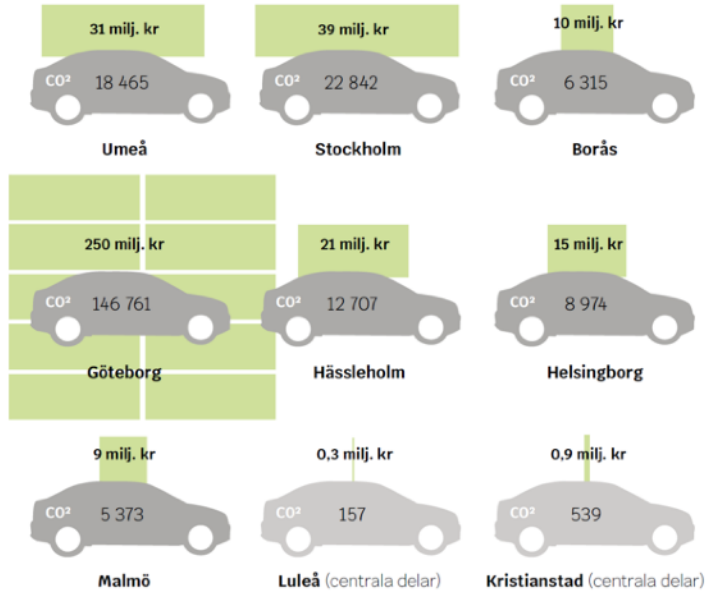
i-Tree Sverige project – project partners

i-Tree Sweden is a nationwide project funded by 26 municipalities and organizations such as housing companies, arboricultural contractors, and cemetery management organizations.

- Arbor Konsult AB, Stockholm
- Borlänge Energi, Borlänge kommun
- Borås stad
- Bostads AB Poseidon, Göteborg
- Eskilstuna kommun
- Familjebostäder i Göteborg AB
- FSK, Föreningen Sveriges Kyrkogårdschefer
- Park- och naturförvaltningen, Göteborgs stad
- Halmstad kommun
- Helsingborgs kommun
- Hässleholm kommun
- Kristianstad kommun
- Luleå kommun
- Malmö stad
- Movium partnerskap
- Naturresursinstitutet, Finland
- Norskt Institut för naturforskning, Norge
- Skövde kommun
- AB Stockholmshem
- Svenska Trädföreningen
- Trafikkontoret, Stockholm stad
- Trädliv AB, Bagarmossen
- Umeå kommun
- Uppsala kommun
- Uppsala kyrkogårdsförvaltning
- Ystad kommun

i-Tree Sverige project – project results

Den årliga kolupptagningen av trädbestånden i i-Tree Sverige motsvarar det årliga koldioxidutsläppet från 222 133 personbilar.



Tabell 16. Ta
antalet träd i procent i förhållande till storlek av stamdiameter, i cm.[1]

Bostadsbolag	Diameter 0-7,6 cm	Diameter 7,6-15,2	Diameter 15,2-30,5	Diameter 30,5-45,7	Diameter 45,7-61	Diameter 61-76,2	Diameter 76,2 -91,4	Diameter 91,4- >122
Familjebostäder i Göteborg AB	0	39	33	21	0	6	0	1
Bostads AB Poseidon Väster	4	6	29	35	18	4	2	2
AB Stockholmshem Eslövsvägen	0	8	28	47	12	2	0	3

TreeTag campaign – Pius Floris / Treeconomics (NL, BE, UK, SE


Platform i-Tree Nederland
Pius Floris Boomverzorging...


VOA Online
Actie #TreeTag maakt het belang v...


Nederlandse Tuinenstichting
Belang van bomen zichtbaar met Tr...


Pius Floris
Downloads


Platform i-Tree Nederland
Pius Floris Boomverzorging A...


Boomzorg
Ierland omarmt de Nederlandse TreeTa...


Facebook
Pius Floris Boomverzorging - Ook ...


Yoors
TreeTag maakt het belang v...


Rheden Nieuws - Nieuws.nl
Bomen krijgen label, actie #TreeTag maak...


Platform i-Tree Nederland
Pius Floris Boomverzorging Actie Tr...


Boomkronen
TreeTags | Pius Flor...


Pius Floris
Stadswerk 06 2020....


Eindhovens Dagblad
Drie beroemde bomen in Eindh...


AD
Twaalf bomen in Woensdrecht voorzie...


Platform i-Tree Nederland
Pius Floris Boomverzorging ...


Amsterdamsdagblad.nl
Actie #TreeTag maakt het belang v...


Facebook
TreeTag voor 250 jaar oude... - Piu...


VOA Online
Actie #TreeTag maakt het belang van b...


Brabants Dagblad
Kijk, zo nuttig is een...


hetkanWEL
TreeTag maakt het belang van bomen z...


PZC
Treetags in Het Par...


Vandaagenmorgen.nl
Tree tags laten zien hoev...


Boomkronen
Leiden Gewone vleugelnoot Plants...


Blik Op Noordwijkerhout
Actie TreeTag in gemeente Noordwij...

TreeTag campaign – inspired by Jenny Garden (Australia)

Great educational tool for kids

Wonderful idea!

Definitely need more tags around schools and libraries

Fantastic idea!

Fun for people to see and recognise

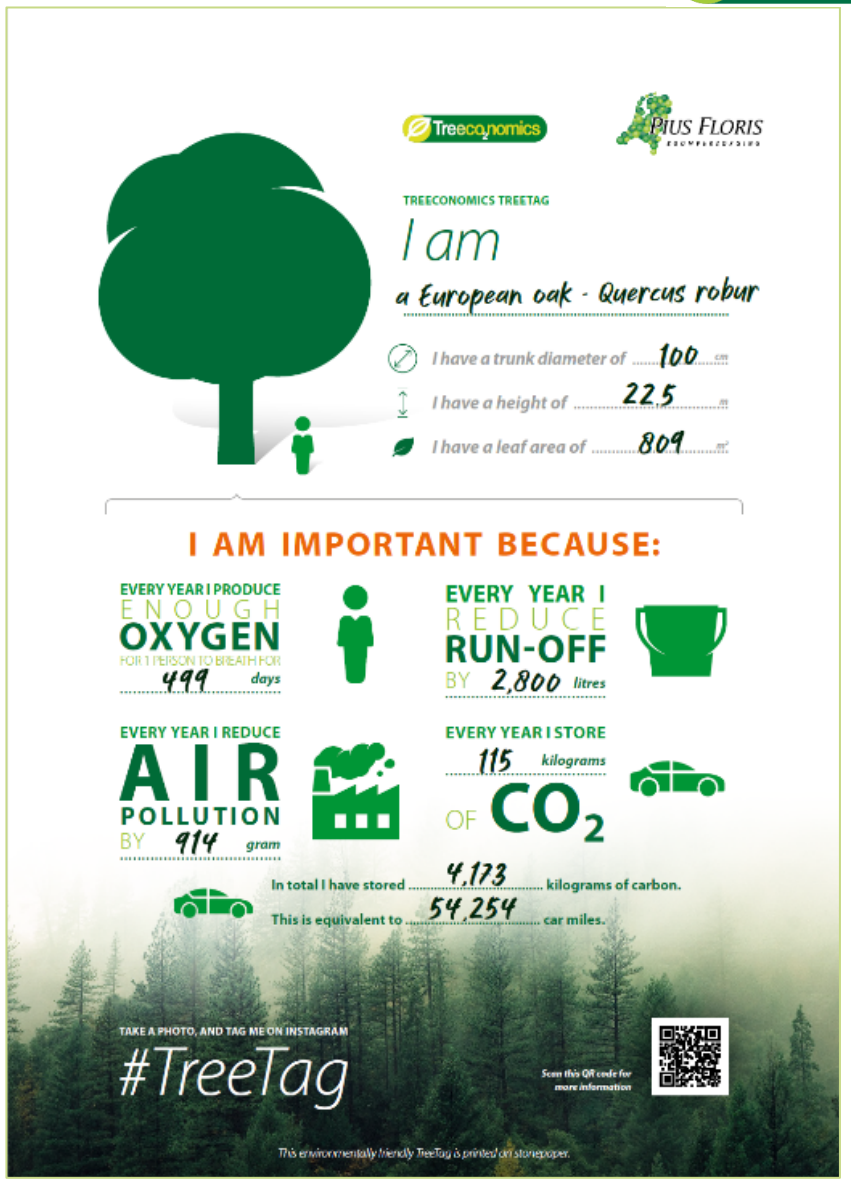
Good to have a figure…people can relate to easily

When you see them, you know they're something special so you go and have a look

Before I thought it was old and ugly but after reading the information on the tag I don't think that anymore…
…yes, I will view other trees differently now

Makes people appreciate trees

TreeTag campaign – European version



TreeTag campaign – June 18th 2020

TreeTag campaign – Local newspapers and social media

AD Alphen

vrijdag 19 juni 2020

TreeTag: kaartjes aan bomen vertellen hoe belangrijk ze zijn

Het is wachten op de eerste liefdesbrief aan de rode beuk

▲ Mark Rotteveel plaatst een TreeTag in Alphen.

De Boomfeestdag in Alphen ging helaas niet door. Maar gisteren vond bij twee beuken aan de Castellumstraat wel de aftrap plaats van de actie TreeTag.

Hans-Paul Andriessen
Alphen

Door aan bomen een TreeTag, een duurzame poster op A3-formaat, te hangen met harde gegevens over de boom, moeten de waardering en de liefde voor de boom aangewakkerd worden. De TreeTag is het visitekaartje van die unieke boom.

Klimaatopwarming

Een TreeTag-actie in Australië dat hevig kampt met klimaatopwar-

de Gelderlander

REGIO ALGEMEEN SPORT VIDEO OPINIE FUN

Regio wijzigen Arnhem e.o. Nijmegen e.o. Achterhoek Betuwe De Vallei Liemers

▲ De linde in Sambeek © Pius Floris Boomverzorging Nederland

Oude Sambeekse linde krijgt TreeTag: 'Ik lever jaarlijks voor 52 dagen zuurstof'

SAMBEEK - Het is een knoeperd van een boom de linde aan de

KPN NL 4G 11:37

mobile.twitter.com

Zoeken op Twitter

Inloggen Registreren

عبدالله الدخيل الله
@ARCH3badi

في هولندا، حملة #TreeTag بحيث يتم وضع لوحة مواصفات وأداء للأشجار وخاصة المعمرة و التي لها تأثير إيجابي كبير على البيئة.

وذكر نسبة الأكسجين الذي تضيفه للبيئة و ثاني أكسيد الكربون الذي تسحبه، وارتفاعها وقطر التاج المظلل وعمرها..

Irona Groeneveld @ironagroeneveld · 18 jun.

Onze @gemeenteDFM deed mee met de actie #TreeTag; aandacht voor het belang van bomen. Ze leveren zuurstof, nemen CO2 op, geven schaduw, maken de omgeving mooi en leefbaar. Daarom aan de monumentale Plataan bij de RK kerk in Joure een TreeTag met alle info over deze boom.

KPN NL 4G 20:44

MEEST RECENT

#treetag

PIUS FLORIS BOOMVERZORGING TREETAG

Ik ben een bruine beuk

Ik heb een stamdiameter van 150 cm

Ik heb een hoogte van 25 m

Ik heb 1772 m² aan bladeren

IK BEN BELANGRIJK WANT:

IK LEVER JAARLIJKS 51 dagen ZUURSTOF VOOR 1 PERSOON

IK HOUD JAARLIJKS 6200 liter REGEN WATER VAST

IK VANG JAARLIJKS 1995 gram LUCHT VERVUILING AF

IK VANG JAARLIJKS 11,7 kilogram CO_2 AF

Totaal heb ik 595.2 kilogram koolstof opgeslagen.

Dit staat gelijk aan 200.402 autokilometers.

MAAK EEN FOTO EN TAG MIJ OP INSTAGRAM!

#TreeTag

9 vind-ik-leuks

stefanie_inthelead #treetag #bolwerken #haarlem #tree #trees #safetheplanet #nature

manon.galama Yes zag deze ook hangen deze week. Echt leuk en goed!!

3 uur geleden

TreeTag campaign – still going strong

European TreeTag campaign 2024

EUROPEAN TREETAG CAMPAIGN

Powered by i-Tree

19 SEPT. 2024

WWW.TREETAGS.EU

Our Trees project Almere – 2022-2023

Gemeente Almere

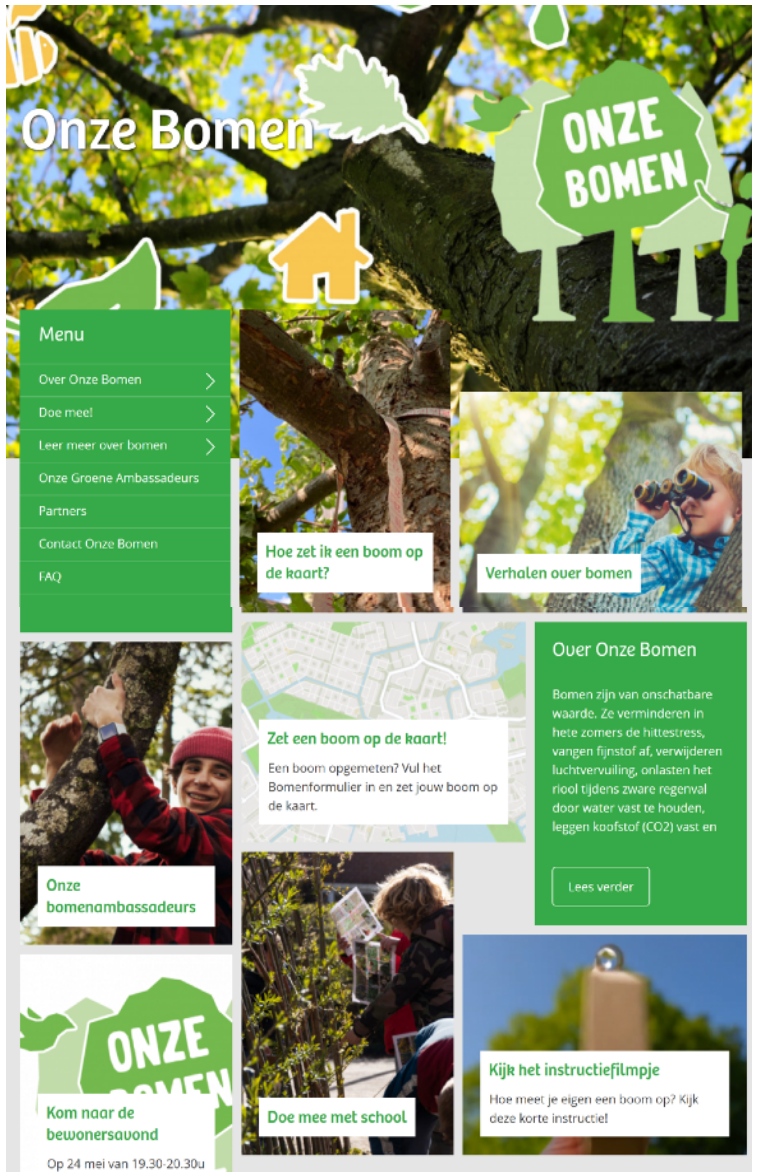
Almere 2.0

staatsbosbeheer

ivn natuur educatie

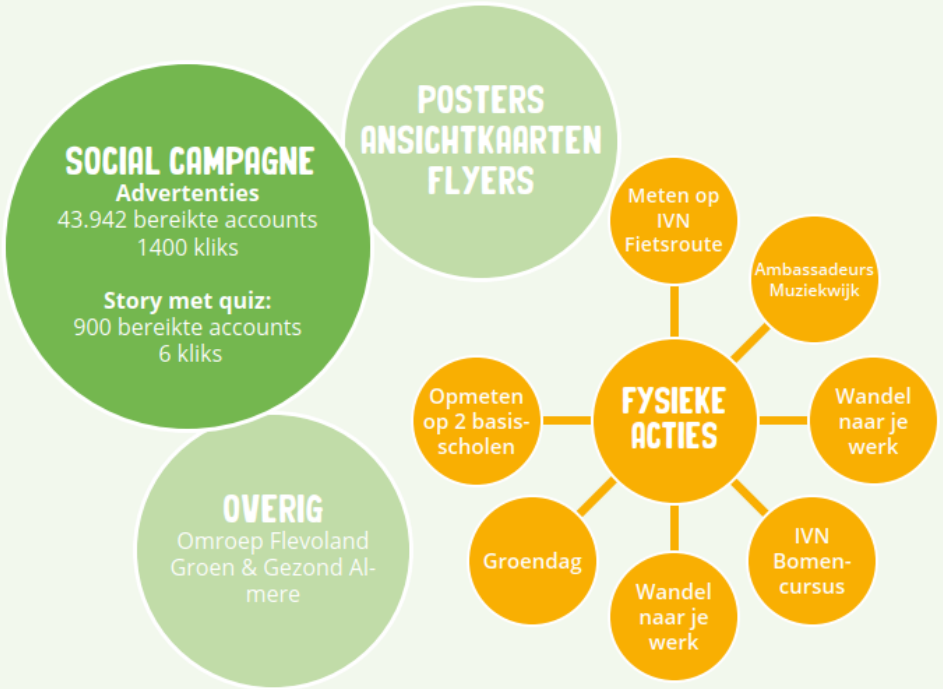
Our Trees project Almere – project goals

- Enlarge awareness of the benefits of trees
- Stimulate inhabitants planting and preserve trees
- Collect data of private and public trees



CAMPAGNEBEREIK

De Onze Bomen-campagne heeft mensen bereikt via:



BOMENVERHALEN

"GEKREGEN VAN VRIENDEN VOOR ONS TROUWEN. BOOM IS MEE VERHUISD NAAR DIT ADRES EN DUS HERPLANT IN 2015"

"TOEN WIJ HIER 12 JAAR GELEDEN KWAMEN WONEN WAS HET EERSTE WAT IK ZAG VAN MIJN TUIN DE MOOIE VLIER! "

TOP 3 Meest voorkomende boomsoort onder opgemeten bomen

- Zomereik
- Zoete kers
- Plataan

TOP 3 Meest voorkomende boomsoort in Almere

- Zomereik
- Vogelkers
- Es

De tree-tag van de ingemeten bomen zie je op de achterkant van dit factsheet.

Conclusion

➢ i-Tree is a set of tools, not the solution
➢ It calculates only 4 of the 20 ecosystemservices trees deliver
➢ The data output is highly dependent on the precision of the input data

➢ i-Tree can quanfity and monetize the ecosystemservices based on specific local data
➢ it gives insight into the structure and services of the urban forest

It's a valuable tool for:
➢ a new way of **urban forest management**: based on function and ecosystemservices
  ➢ *with a focus on healthy mature trees*
  ➢ *with i-Tree it's possible to prioritize where trees have de most (positive) impact*
➢ creating **awareness** of the value of trees, within politics and society
➢ **increase budget** for (good) planting and maintenance focus on long term
➢ creating **new partnerships** in building healthy cities based on Nature Based Solutions

Time for a break!

Workshop: Planning an i-Tree project

i-Tree Eco's 3 basic assumptions

[Population management]

Making the most of trees requires a strategic approach to tree population management.

[Green Asset Valuation]

Although not all benefits of trees can be quantified, it is worth assessing and valuing some of the services trees provide.

[Leading change]

Better data can (if used well) promote better understanding which in turn (if target for the right people) can lead to change.

>>> Being clear **on the changes to be achieved** & having a **'leader'** to drive theprojectd as a change initiative is **FUNDAMENTAL**

Tree population management (= Urban forestry)

Focuses on **benefits delivery** (ie trees as a means to an end).

Recognises that **an area-wide, strategic approach** (whole population vs single tree, or ownership based) is necessary to secure the sustained delivery of benefits.

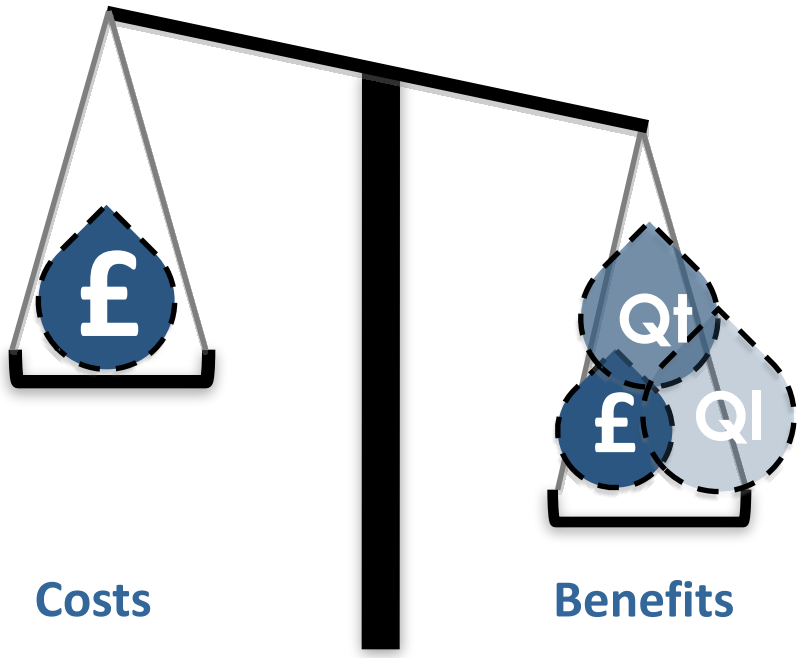
Recognises that is implementing such approach is fundamentally a **multi-party endeavour.**

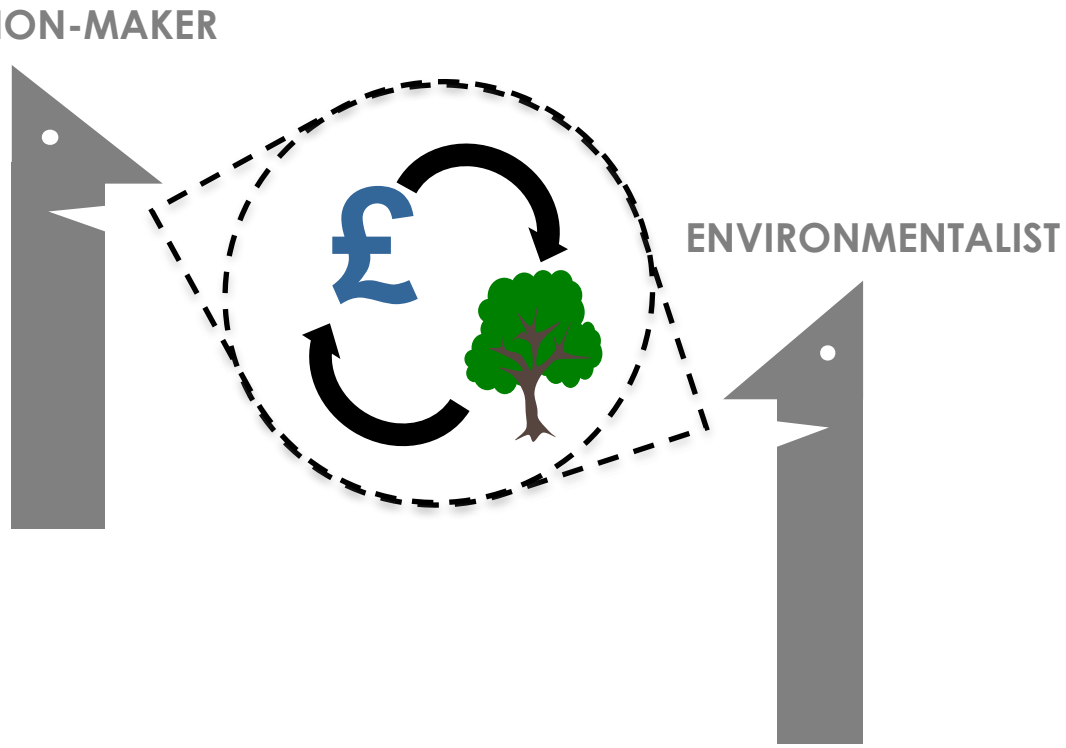
For example:

- highways/infrastructure manager;
- planning/development control;
- estate owners/managers;
- communities;

Are likely to have **more direct impact** than city forester, arboricultural manager, green space and woodland specialist.

Green asset valuation





"Information does not necessarily lead to increased awareness, and increased awareness does not necessarily lead to action. Information provision (…) must be backed up by other approaches."

Demos & Green Alliance, 2003
DEFRA-commissioned research on sustainable consumption & behavioural change

Workshop task 1:

What are your core objectives with your i-Tree project? Who is your key audience?

What are your core objectives with your i-Tree project?
Who is your key audience?

→ Who will be using the results?
→ What will they using them for?
→ Why?

Workshop task 2:

Find your top 5 key audiences

Top 5 key audiences

3 – Extremely desirable / impactful (Pivotal - prerequisite)
2 – Very desirable / impactful (Meaningful)
1 – Quite desirable / impactful (Helpful) **D**

3 – Already 'converted'
2 – Quite willing
1 – Less willing **A**

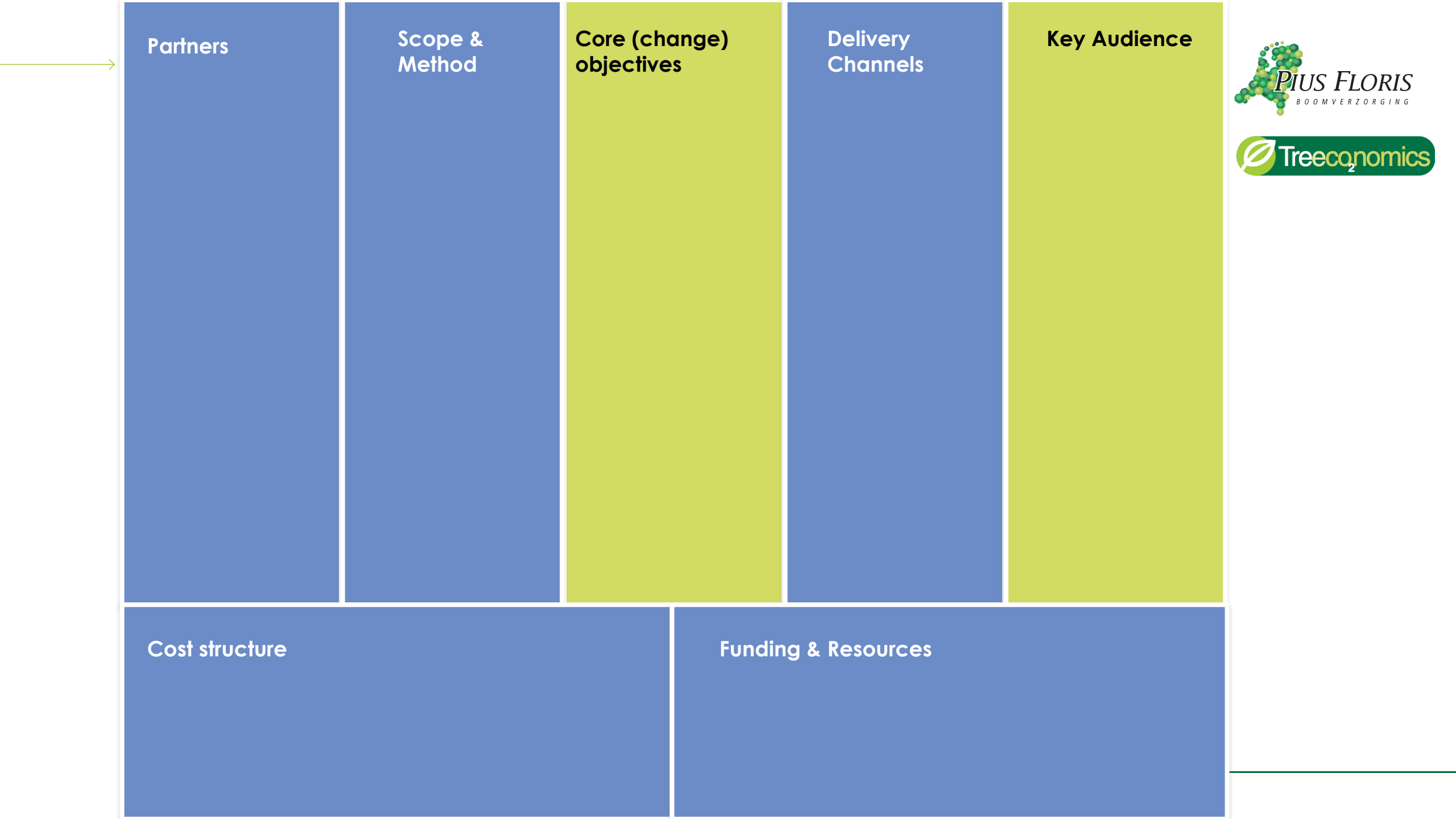
Score: **D**esirability *(Impact)* **A**chievability *(Willingness)*

Sum: **D** + **A** scores

Pick: Your top 5 key audiences

Workshop task 3:

You have now defined your key audience & your core objectives… Let's capture this!


Partners
Scope & Method
Core (change) objectives
Delivery Channels
Key Audience
Cost structure
Funding & Resources
PIUS FLORIS
BOOMVERZORGING
Treeconomics

Partners	Scope & Method	Core (change) objectives	Delivery Channels	Key Audience
		Greater community involvement in local decisions around trees Highlight the Sidmouth Arboretum idea Inform future planting		Local residents Councillors Tree officers

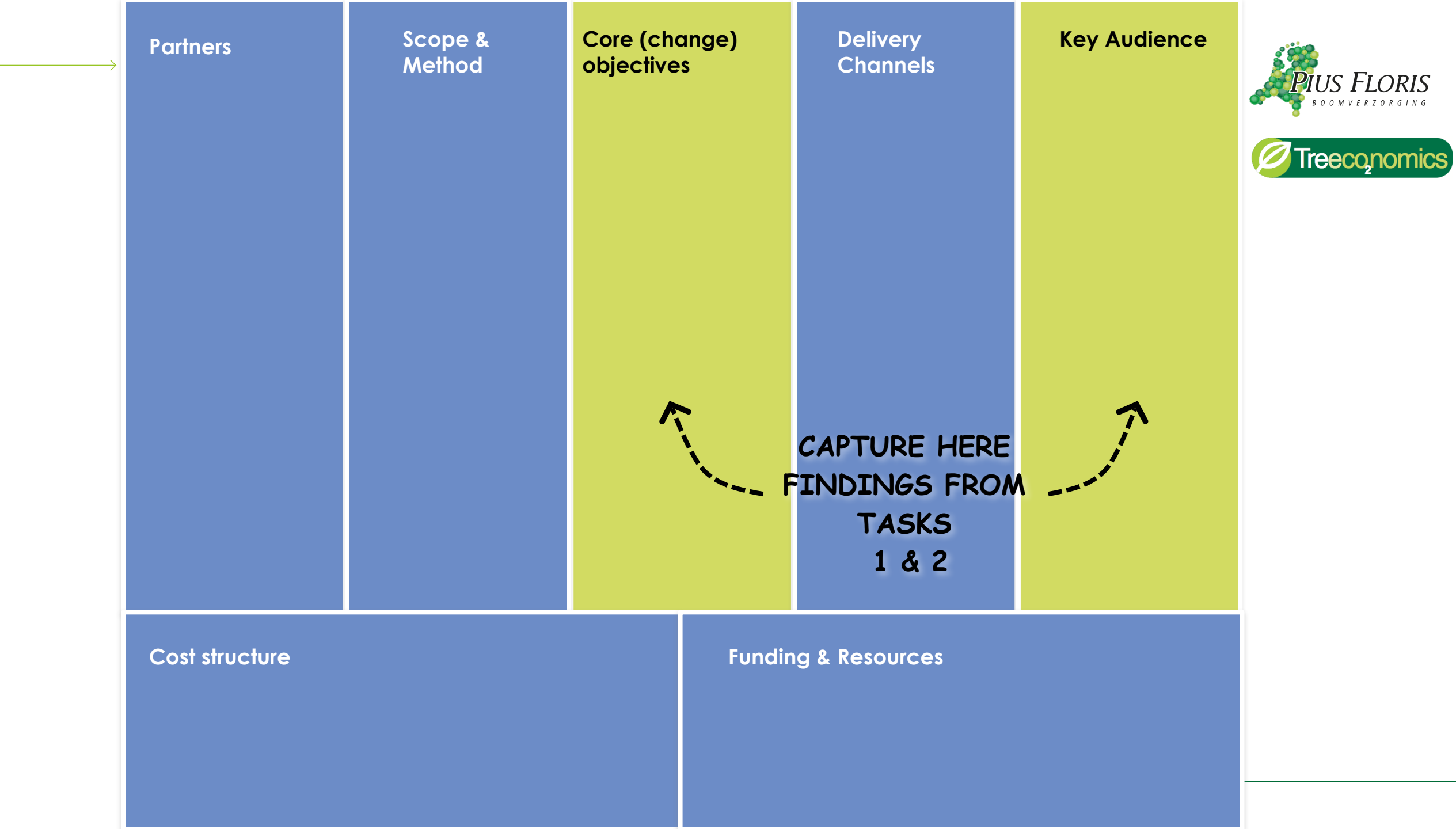
Cost structure	Funding & Resources

PIUS FLORIS BOOMVERZORGING

Treeconomics

For example

Sidmouth ARBORETUM


Partners
Scope & Method
Core (change) objectives
Delivery Channels
Key Audience
CAPTURE HERE FINDINGS FROM TASKS 1 & 2
Cost structure
Funding & Resources
PIUS FLORIS
BOOMVERZORGING
Treeconomics

Workshop task 4:

What are the best ways for getting the key audience to act? (now and later)

Partners	Scope & Method	Core (change) objectives	Delivery Channels	Key Audience
		Greater community involvement in local decisions around trees Highlight the Sidmouth Arboretum idea Inform future planting	Website Newspaper article Tree walk Science fair stand Treeconomics presentation Report summary Raw data	Local residents Councillors Tree officers

Cost structure	Funding & Resources

PIUS FLORIS BOOMVERZORGING

Treeconomics

For example

Sidmouth ARBORETUM

Partners	Scope & Method	Core (change) objectives	Delivery Channels	Key Audience

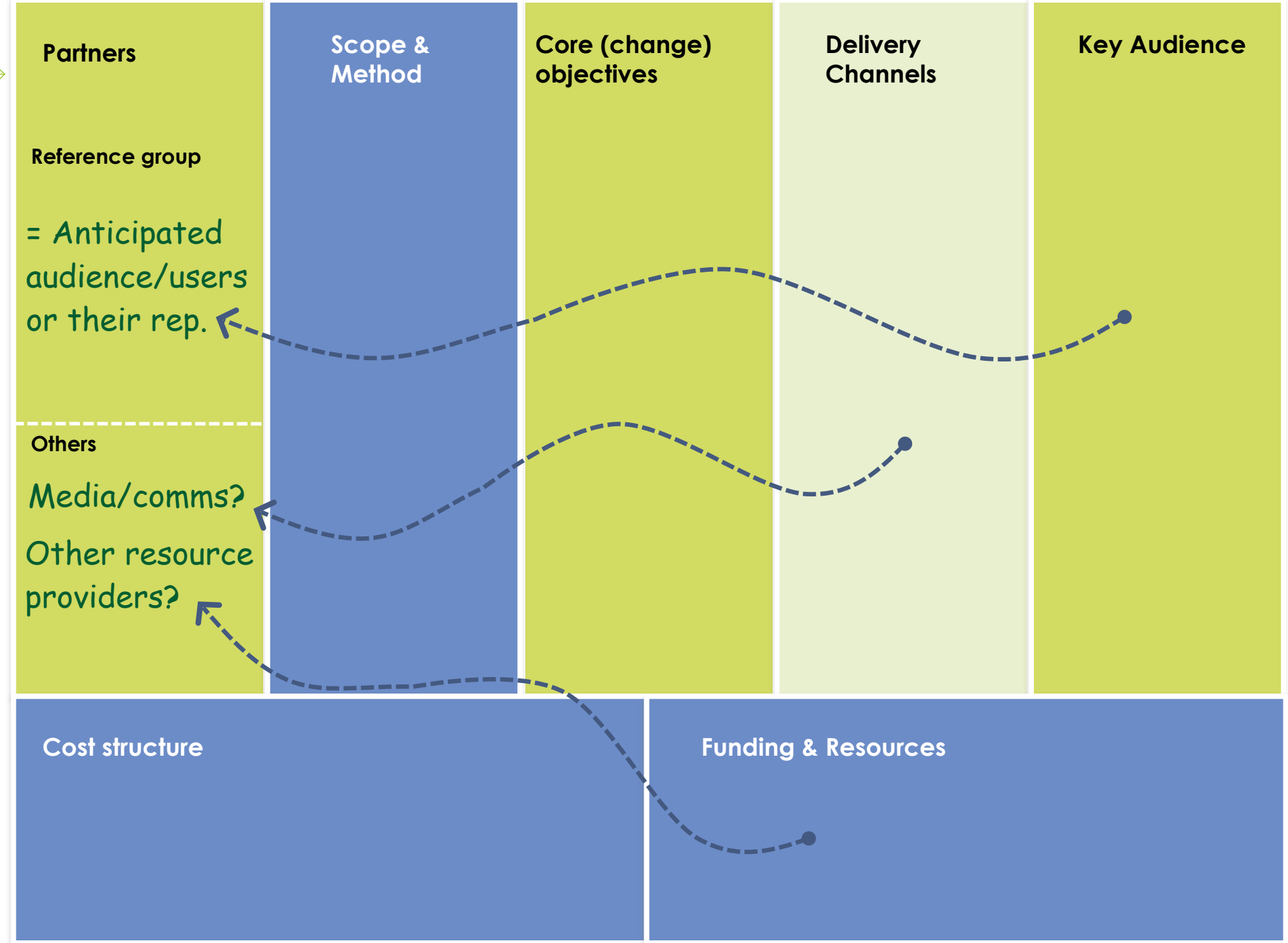
NOW WE FOCUS ON THIS BLOCK

Keep the 4 'E's in mind! (Encourage, Enable, Engage, Exemplify)

Cost structure	Funding & Resources

Workshop task 5:

Who needs to be involved in the project?


Partners
Reference group
= Anticipated audience/users or their rep.
Others
Media/comms?
Other resource providers?
Scope & Method
Core (change) objectives
Delivery Channels
Key Audience
Cost structure
Funding & Resources

Partners

Reference group

Sidmouth Arboretum

Tree officers

Parish councillor

Others

Treeconomics

Science fair organisers

Schools

Scope & Method

Core (change) objectives

Greater community involvement in local decisions around trees

Highlight the Sidmouth Arboretum idea

Inform future planting

Delivery Channels

Website

Newspaper article

Tree walk

Science fair stand

Treeconomics presentation

Report summary

Raw data

Key Audience

Local residents

Councillors

Tree officers

Cost structure

Funding & Resources

For example

Sidmouth ARBORETUM

Workshop task 6:

What's the scope and method in the project?

Partners	Scope & Method	Core (change) objectives	Delivery Channels	Key Audience
	Geographical focus			
	Data collection method			

NOW WE FOCUS ON SCOPE & METHOD

Cost structure	Funding & Resources

Partners

Reference group

Sidmouth Arboretum

Tree officers

Parish councillor

Others

Treeconomics

Science fair organisers

Schools

Scope & Method

Geographical focus

Whole parish

Data collection method

Volunteers / Treeconomicvs for training & oversight

Core (change) objectives

Greater community involvement in local decisions around trees

Highlight the Sidmouth Arboretum idea

Inform future planting

Delivery Channels

Website

Newspaper article

Tree walk

Science fair stand

Treeconomics presentation

Report summary

Raw data

Key Audience

Local residents

Councillors

Tree officers

Cost structure

Funding & Resources

For example

Sidmouth ARBORETUM

Workshop task 7:

How do you get the funding for the project?

Partners	Scope & Method Geographical focus Data collection method	Core (change) objectives	Delivery Channels	Key Audience
Cost structure		Funding & Resources Fill in this block!		

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BOOMVERZORGING

Treeconomics

KEEP IN MIND!

Experiences from around the world show that a well-planned i-Tree Survey will allow you to kick-off a wide range of changes / actions…

… but the most effective tool to keep this momentum alive and sustain change overtime is to develop and adopt a

TREE STRATEGY /

URBAN FOREST MANAGEMENT PLAN!

Thanks for your attention!

Kenton Rogers

kenton@treeconomics.co.uk

+44 (0)1392 249170

Mark Rotteveel

m.rotteveel@piusfloris.nl

+316-51223803

PIUS FLORIS
BOOMVERZORGING

Partners

Reference group

Others

Scope & Method

Geographical focus

Stratification & land-uses

Data collection method

Phasing

Core (change) objective

Delivery Channels

Key Audience

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Cost structure

[£] [-days]

Funding & Resources

Partners

Reference group

Scope & Method

Geographical focus

Core (change) objective

Long Term

Delivery Channels

Key Audience

Urban Forest Management Plan

-!- KEEP IN MIND:

Experiences from around the world show that a well-planned i-Tree Survey will allow you to kick-off a wide range of changes / actions…

… but the most effective tool to keep this momentum alive and sustain change overtime is to develop and adopt a TREE STRATEGY / URBAN FOREST MANAGEMENT PLAN!

Funding & Resources

[£] [-days]

About costs

	[£]	[-days]
Project planning & management		
Desktop survey preparation		
Training		
Field work		
Data processing & interpretation		
Dissemination		

See hand-out

Project Team

Name	Role	Phone	Email	Notes
	Project Leader/Client			
	Project Co-ordinator			
	Technical Assistant			
	GIS Technician			
	Arborist - Volunteer leader			
Volunteer 1				
Volunteer 2				
Volunteer 3				
Volunteer 4				

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Trees & Design Action Group

Treeconomics

Budget

	Description	Estmiated Costs	No	Total Cost	Notes
Phase 1	Set up Meeting				
Spring	Confirm and define area of study. Arrange shape files. Define information to collect.				
	Draft Timeline, Budget and Project Plan				
	Canopy Survey				
	Ward by Ward Canopy Survey and Report				
Phase 2	Set up Eco Project				
Spring/Summer	Mapping - Create 200 plots. Print plot maps and create survey forms				
	Buy Equipment				
	Training - Tuition				
	Arborist Supervisor				
	Field work. 4 volunteers for 6 weeks.				
	Volunteer Reward - T Shirts, book, etc				
	Input Data				
	QA Data Fields - Clear to send Project				
	Contingency				
Phase 3	CAVAT Values				
Summer/Autumn	Headline Figures				
	Results Meeting				
	Technical report returned				
	Produce Report				
Phase 4	Outreach				
Autumn					
	Urban Forest Strategy				

PIUS FLORIS
BOOMVERZORGING

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Trees & Design Action Group

Treeconomics

Task List

	Date	Tasks	By Whom	Notes
TRUE	Winter 2015	Set up meeting		
TRUE	Spring 2015	Draft Timeline Budget Plan		
FALSE		Canopy Survey and Report		
FALSE		Press Release 1		
FALSE	Spring 2015	Set up Eco on OCC computer		
FALSE		Create 200 Randomised plots		
FALSE		Create 200 Maps for surveyors		
FALSE		Create survey form		
FALSE		Identify private landowners from GIS		
FALSE		Mail merge letters to PL's from GIS		
FALSE		Issue letters to residents		
FALSE		Identify Partners/sponsors for funding or dissemination and or Grant Applications.		
FALSE		Identify Volunteers/ Community engagement stakeholders		
FALSE		Progress Meeting		
FALSE		Buy or Resource Equipment		
FALSE		Organise/Hire Venue for Training		
FALSE	Late Spring 2015	Progress Meeting		
FALSE		Follow up Landowners if no response		
FALSE		Training		
FALSE		Press Release 2		
FALSE	Summer 2015	Field Work		
FALSE		QA		
FALSE	Late Summer 2015	Input Data		
FALSE		Data QA		
FALSE		Pack and send project		
FALSE	Winter 2015/16	Data Returned		
FALSE		Collate interim report		
FALSE		CAVAT Values		
FALSE		Meeting		
FALSE		Press Release 3		
FALSE		Technical Report		
FALSE		Bespoke Report		
FALSE		Press Release 4		

i-Tree workshop Task 7

Assess cost implications:
[£] as well as [-days]

…. and funding opportunities!

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Trees & Design Action Group

Treeco2nomics

i-Tree workshop Task 8

What will be the main headings of your Tree Strategy/Urban Forest Management Plan?

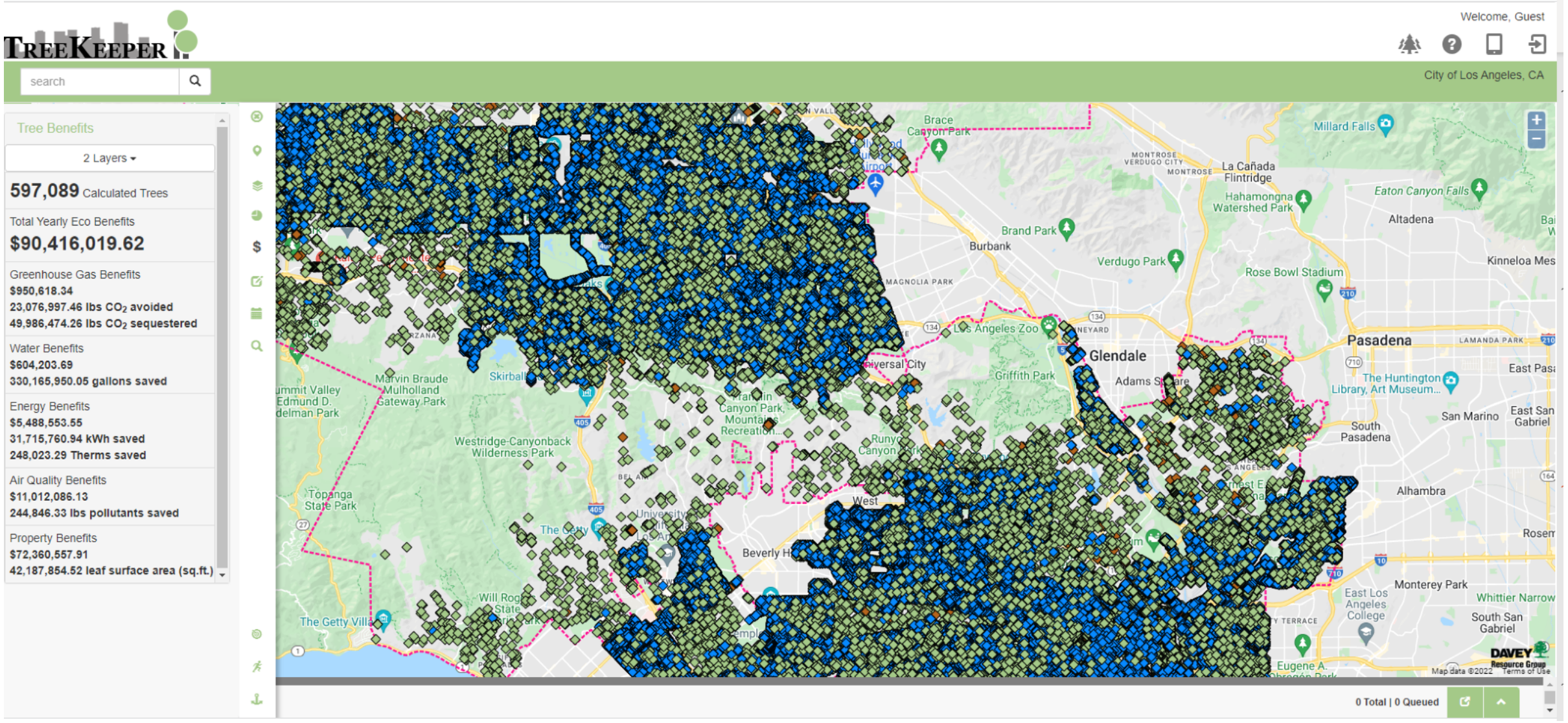
Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Trees & Design Action Group

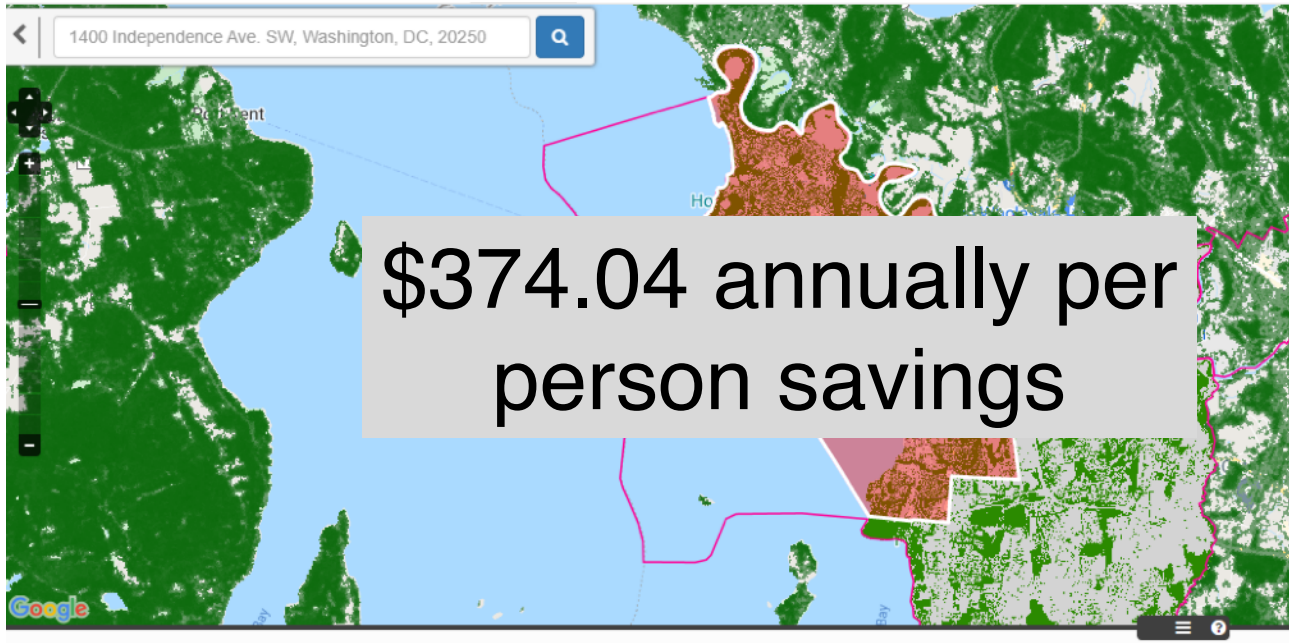
Treeco2nomics

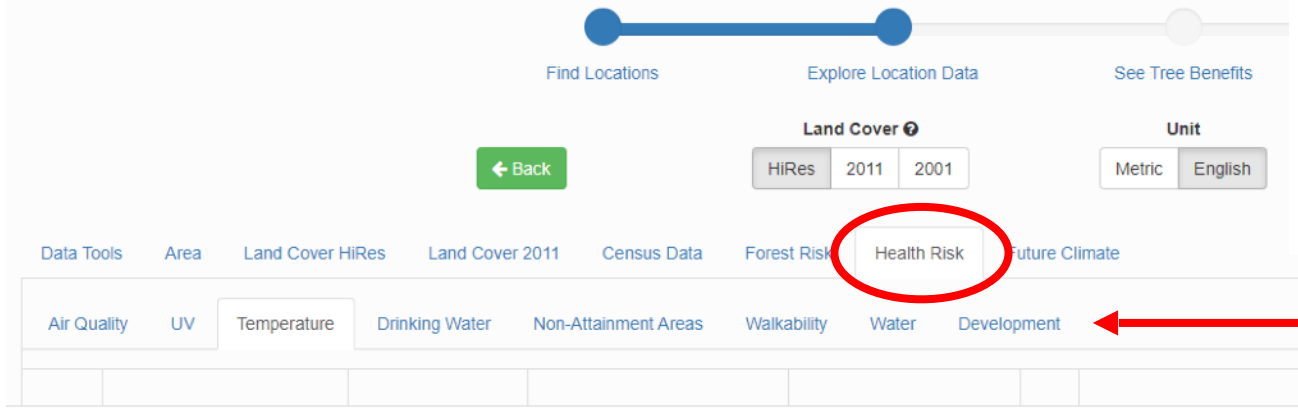
i-Tree developments

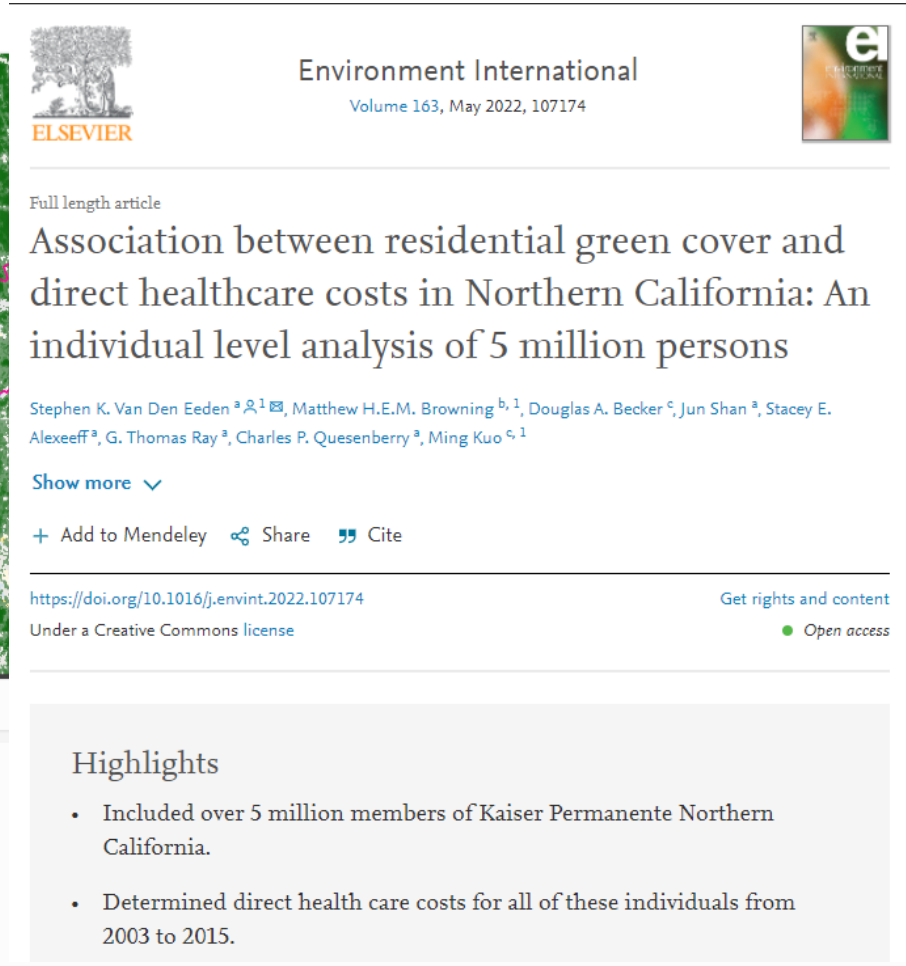
i-Tree USA – API for 3rd Party Integrations



i-Tree USA – Human Health







ELSEVIER

Environment International

Volume 163, May 2022, 107174

Full length article

Association between residential green cover and direct healthcare costs in Northern California: An individual level analysis of 5 million persons

Stephen K. Van Den Eeden [a] [1] ✉, Matthew H.E.M. Browning [b, 1], Douglas A. Becker [c], Jun Shan [a], Stacey E. Alexeeff [a], G. Thomas Ray [a], Charles P. Quesenberry [a], Ming Kuo [c, 1]

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https://doi.org/10.1016/j.envint.2022.107174

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Highlights

- Included over 5 million members of Kaiser Permanente Northern California.
- Determined direct health care costs for all of these individuals from 2003 to 2015.

i-Tree Design v6.0

A30+MP+22/0+EB+(0800A30/124,+L1,+324)

Start Over
Save Progress
About

Get started:

1. Draw Project Areas ?
2. Place Trees ?

Describe your tree:

- Tree species: (8b zone)
- Tree diameter: Centimeters
  or circumference:
- Tree count: 1
- Tree condition: Excellent
- Tree exposure to sunlight: Full sun

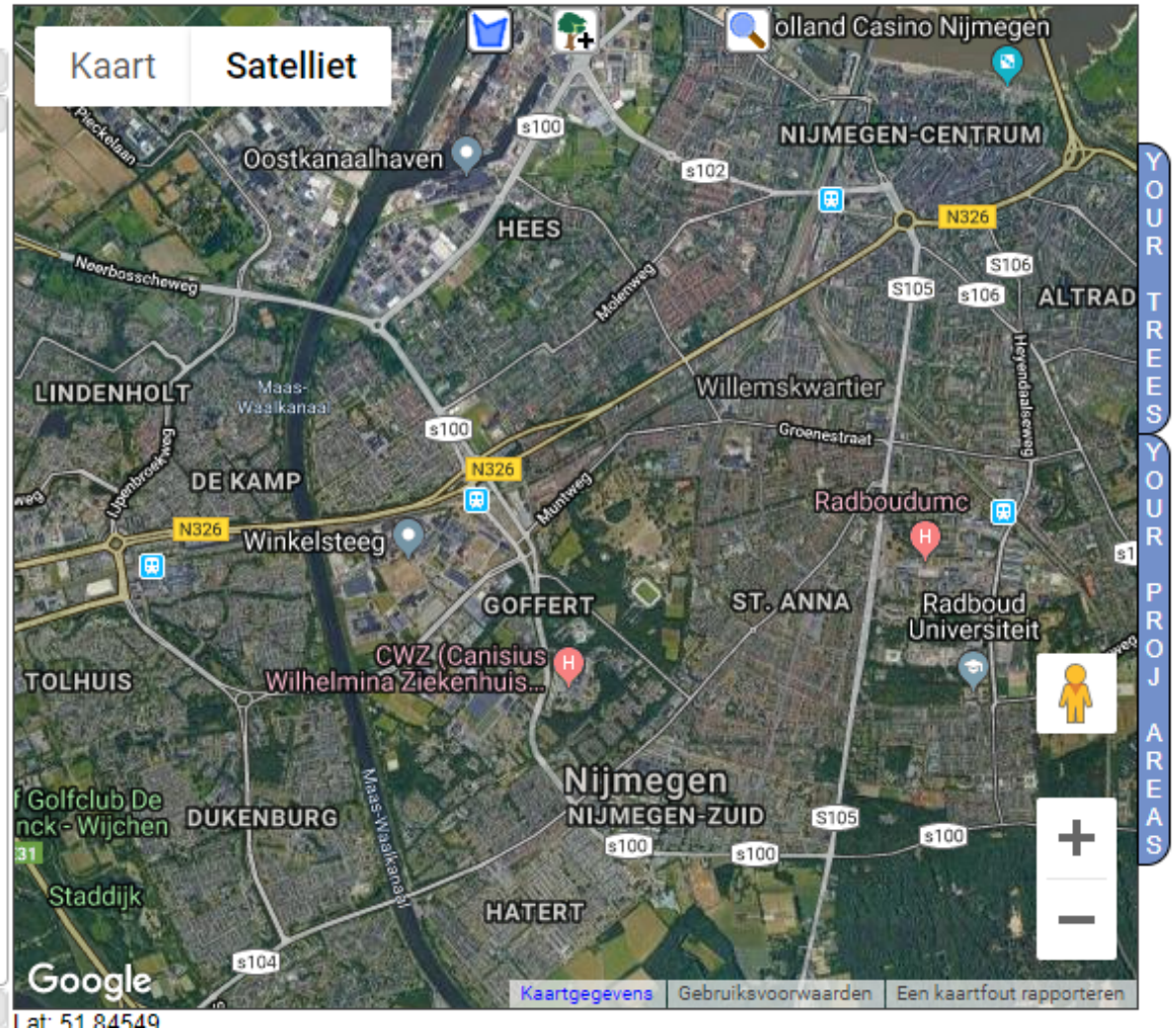
To place a tree:

- Drag this icon to the location on the map where you would like to place your tree.
- Repeat to place additional trees.
- Hover over any tree you have placed on the map to display its benefits.

Model the tree(s) future crown growth over time:

Model Crown Growth

3. Estimate Benefits ?



Lat: 51.84549

Treeconomics – i-Tree Highways

Tree Life Benefits (2018-2118) - Over the next 100 years, based on forecasted tree growth, i-Tree Design projects total benefits worth £13,484,977:

- £3,825,432 of stormwater runoff savings by intercepting 4,734,174,525 liters of rainfall
- £7,564,518 of air quality improvement savings by absorbing and intercepting pollutants such as ozone, sulfur dioxide, nitrogen dioxide, and particulate matter; reducing energy production needs; and lowering air temperature
- £2,095,027 of savings by reducing 120,028,447 kilograms of atmospheric carbon dioxide through CO_2 sequestration and decreased energy production needs and emissions

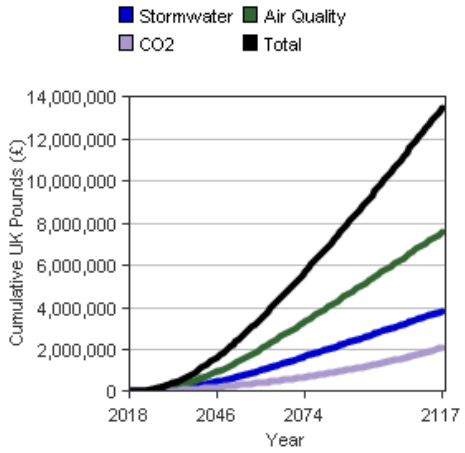


Figure 1. Tree benefit forecast for 100 years

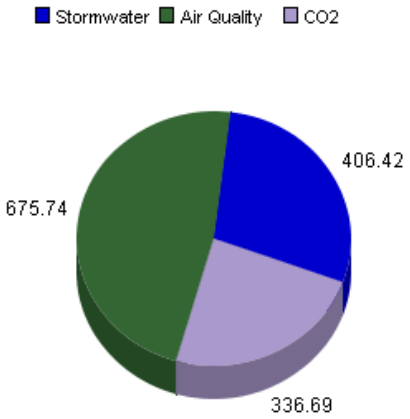


Figure 2. Annual tree benefits for 2018

Current Year - For 2018, i-Tree Design estimates annual tree benefits of £1,418.85:

- £406.42 of stormwater runoff savings by intercepting 492,818 liters of rainfall
- £675.74 of air quality improvement savings
- £336.69 of carbon dioxide reduction savings

Year	2018	2048	2078	2118
New Planting (£)	1,419	1,761,251	6,229,182	13,484,977
Current Forest (to be removed) (£)	9,655	299,312	588,968	975,176

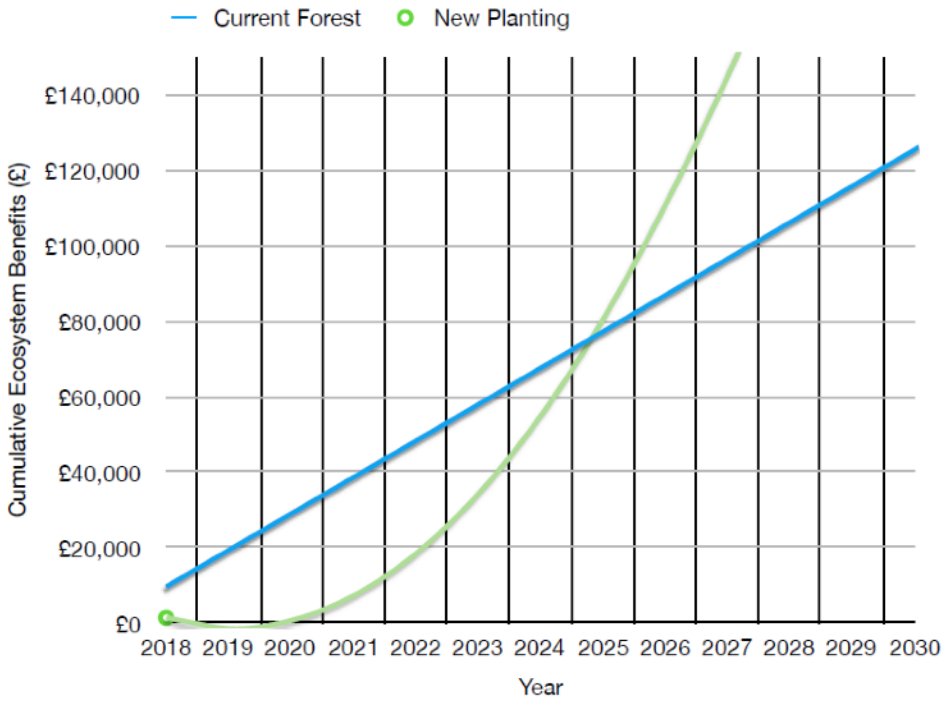
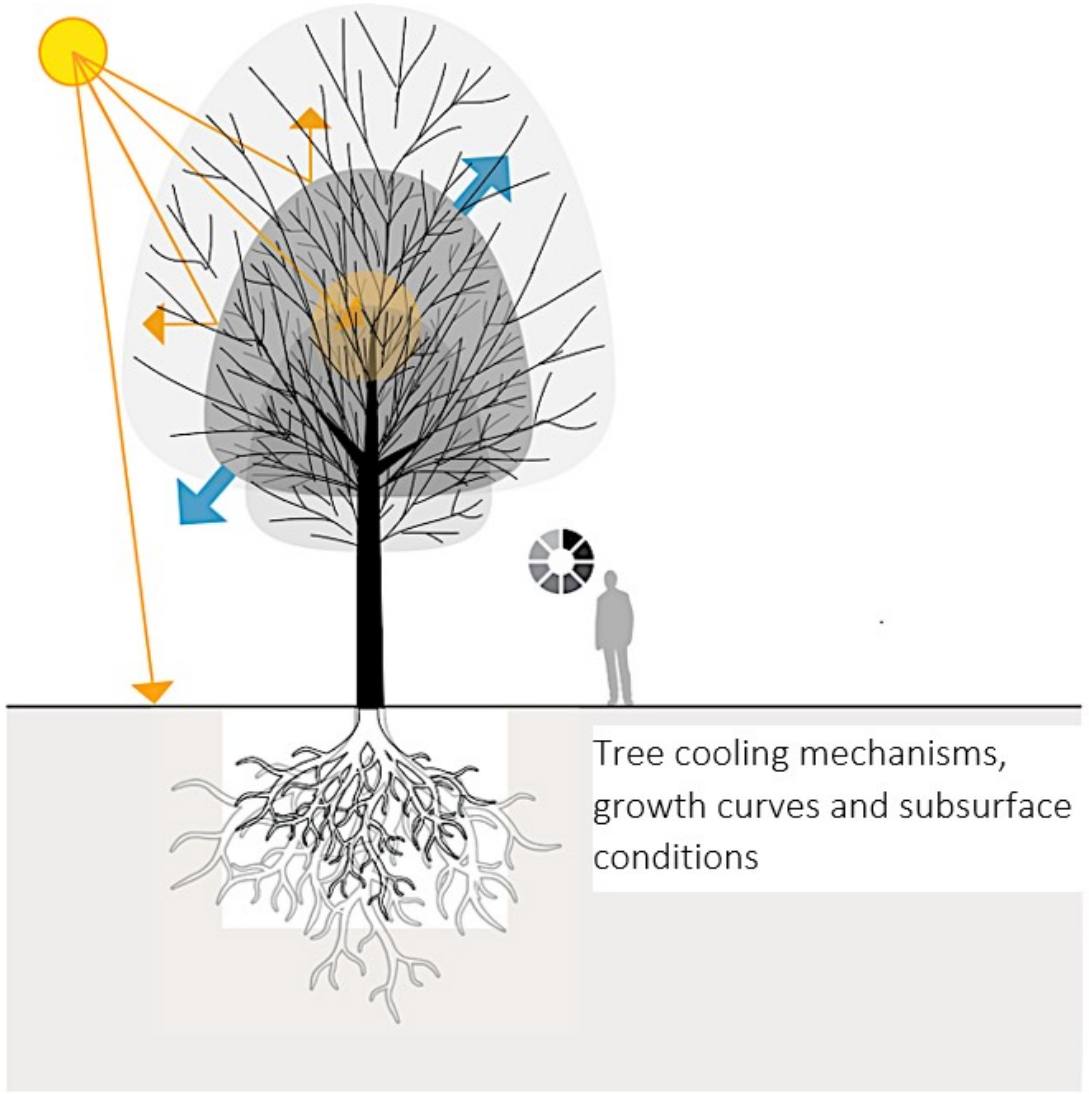


Figure 2: An enlarged portion of Figure 1, focussing on the breakeven point.

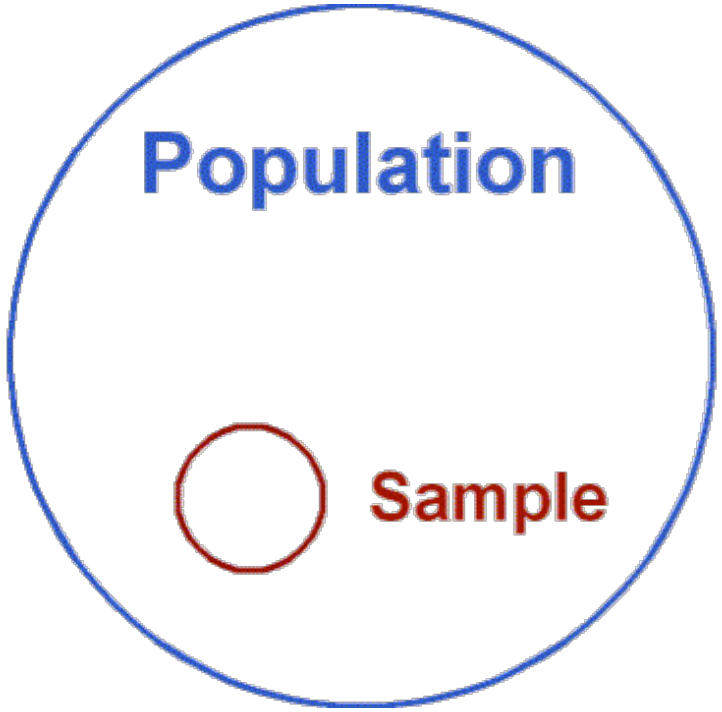
i-Tree 2.0-NL: urban trees for bio-resilient cities

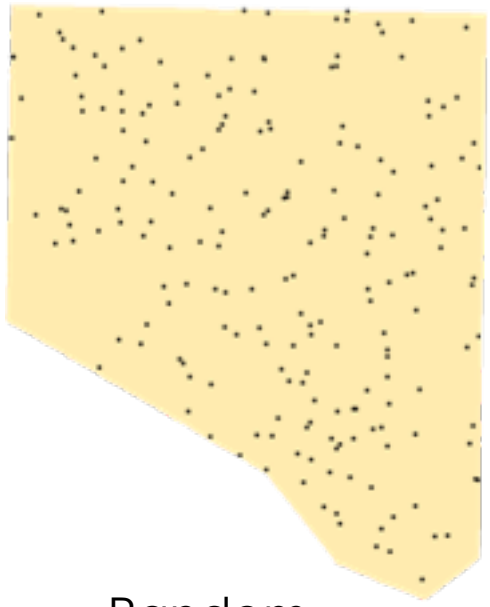


Key methodological choices for

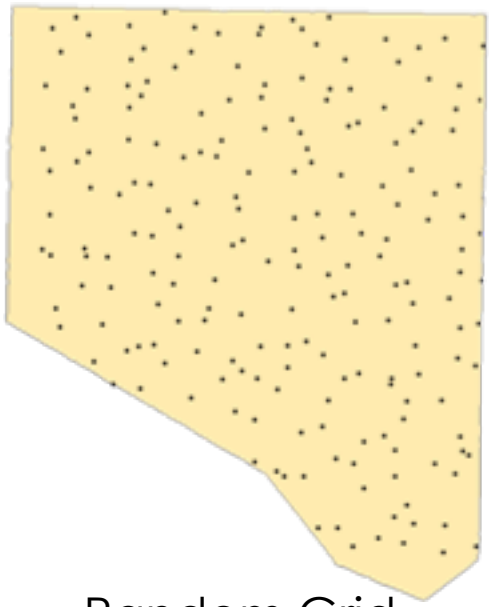
Random sample

- ✓ Data collection in which every member of the population has an equal chance of being selected
- ✓ Can sometimes break population into subgroups (stratification) for better numbers
- ✓ Mind tricks easily, so need rigorous method

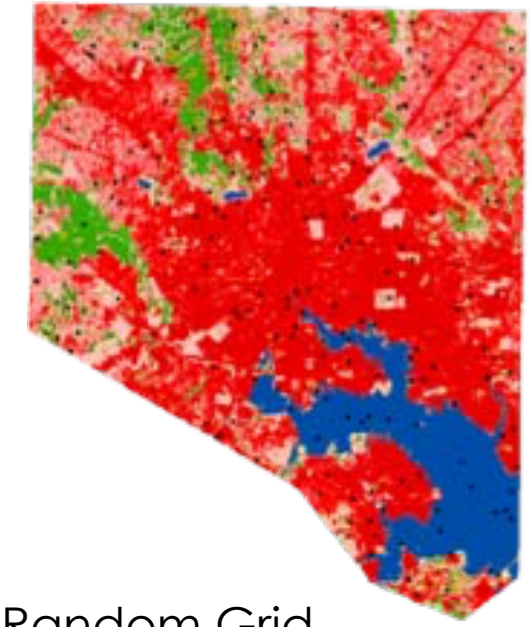




Random



Random Grid



Random Grid Stratified by Landuse

How Many Plots should I use (sample size) ?

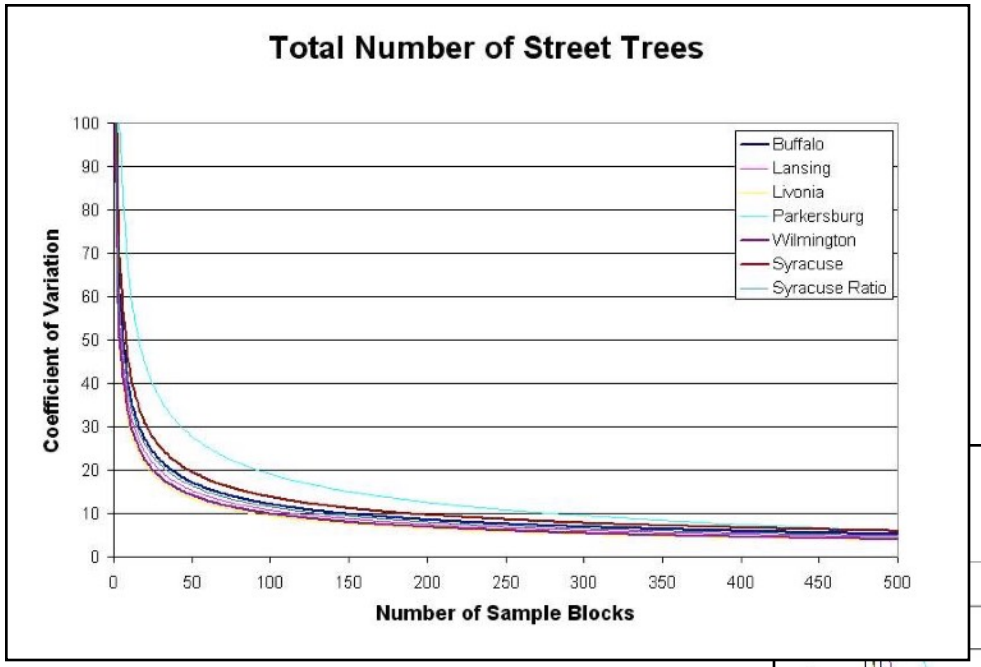
Do I need to Stratify ?

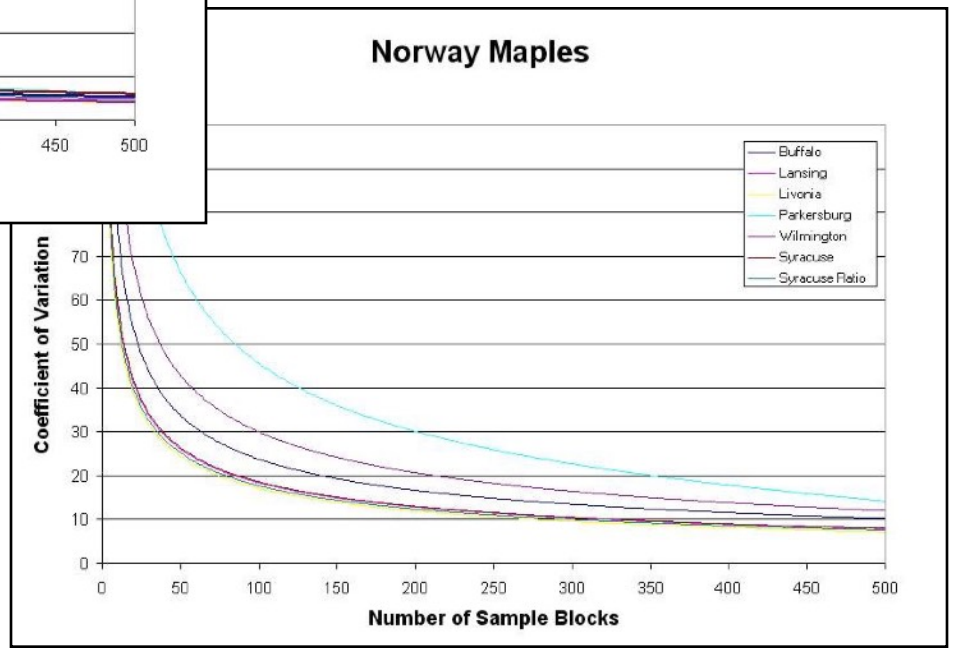
What do I Stratify by ?

Do I Post Stratify or Pre Stratify ?

Variance (= square of SD)

- ✓Measure of how much individual samples vary
- ✓The less the individual measurements vary from the mean (average), the more reliable the mean
- ✓In an urban forest, different traits to investigate (variables) may have different variances
  - E.g., species distribution (high?) vs. population size (low)





Source: Dave Nowak & Jeff Walton, personal communication

We need UK study!

Sample size

✓How big?

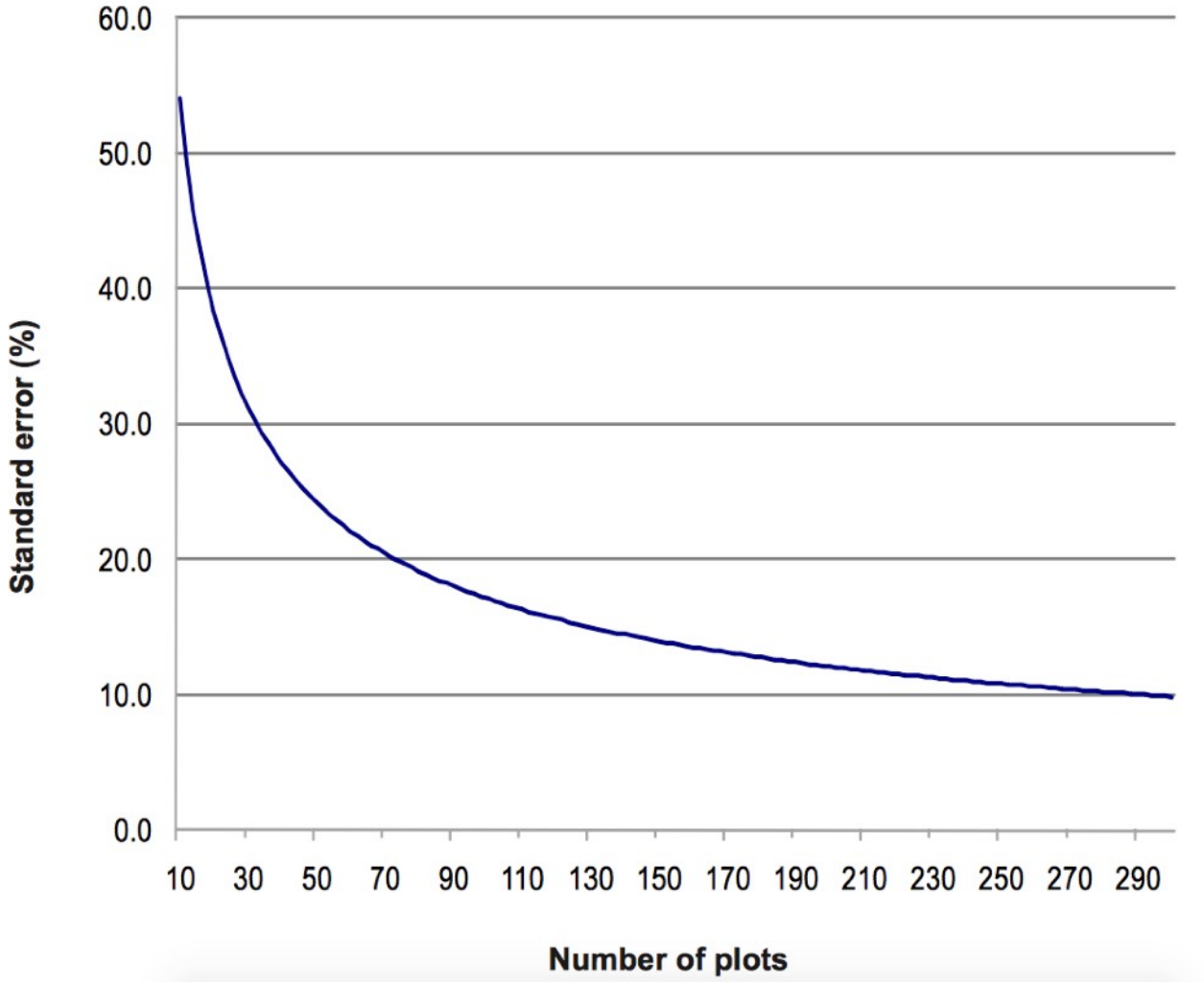
✓Sample size depends on:

- The relationships to be detected (weak → more)
- The significance level sought (high → more)
- The size of the smallest subgroup (small → more)
- The variance of the variables (high → more)

✓Can be smaller as these factors change, especially as variance goes down

Standard error (SEM)

- ✓The Standard Error (Standard Error of the Mean) calculates how accurately a sample mean estimates the population mean.
- ✓Formula: SEM = SD/√N , where SD = "standard deviation" of the sample, and N = sample size.
- ✓Note that as SD goes down or N goes up, SEM gets smaller—i.e., estimate becomes better.
- ✓Commonly represented by "±" after a number.



Source: i-Tree Training Manual

Final sampling thoughts

- ✓Sampling is our friend
- ✓Instructions to set up random plots on GIS in iTree Manual
- ✓The validity of i-Tree depends critically on understanding the process and capability of sampling

Further Resources

Wikipedia discussion: http://en.wikipedia.org/wiki/Sampling_(statistics)

Introduction to sampling: http://mot.vuse.vanderbilt.edu/mt322/IntroSam.htm

Introduction on standard error (SE): http://www.wadsworth.com/psychology_d/templates/student_resources/workshops/stat_workshp/stand_error/stand_error_01.html

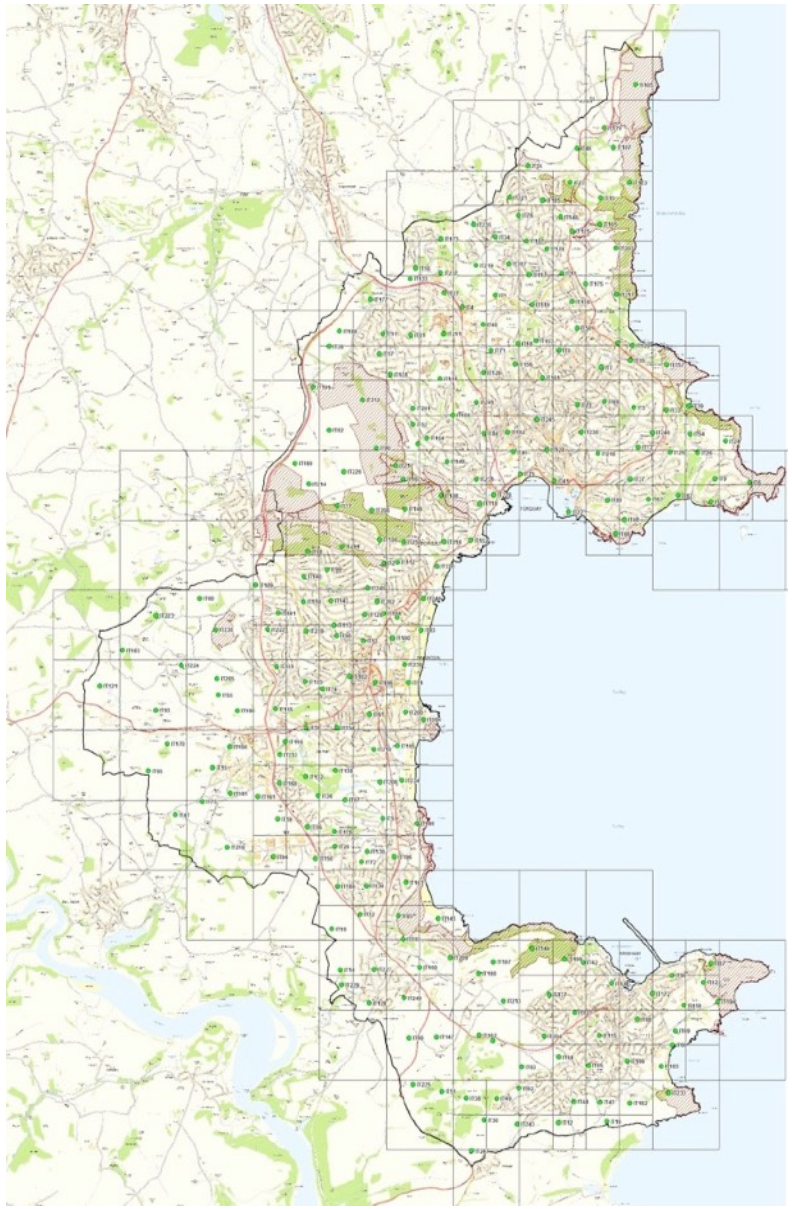
How do we collect the data?

Use existing data?

Collect data through volunteer?

Collect data in-house?

Bring-in expert help?



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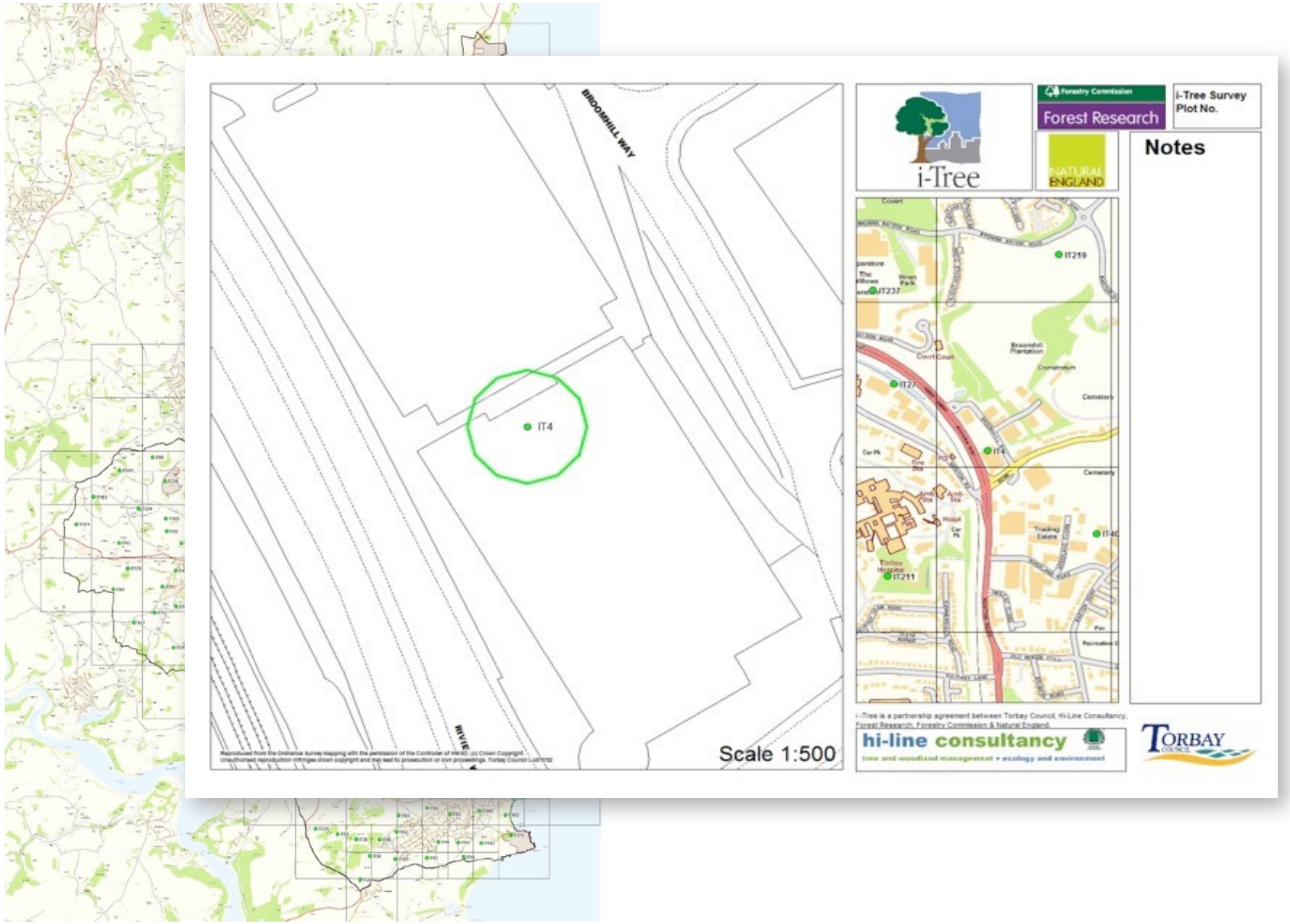
BOOMVERZORGING

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Trees & Design Action Group

Treeco2nomics



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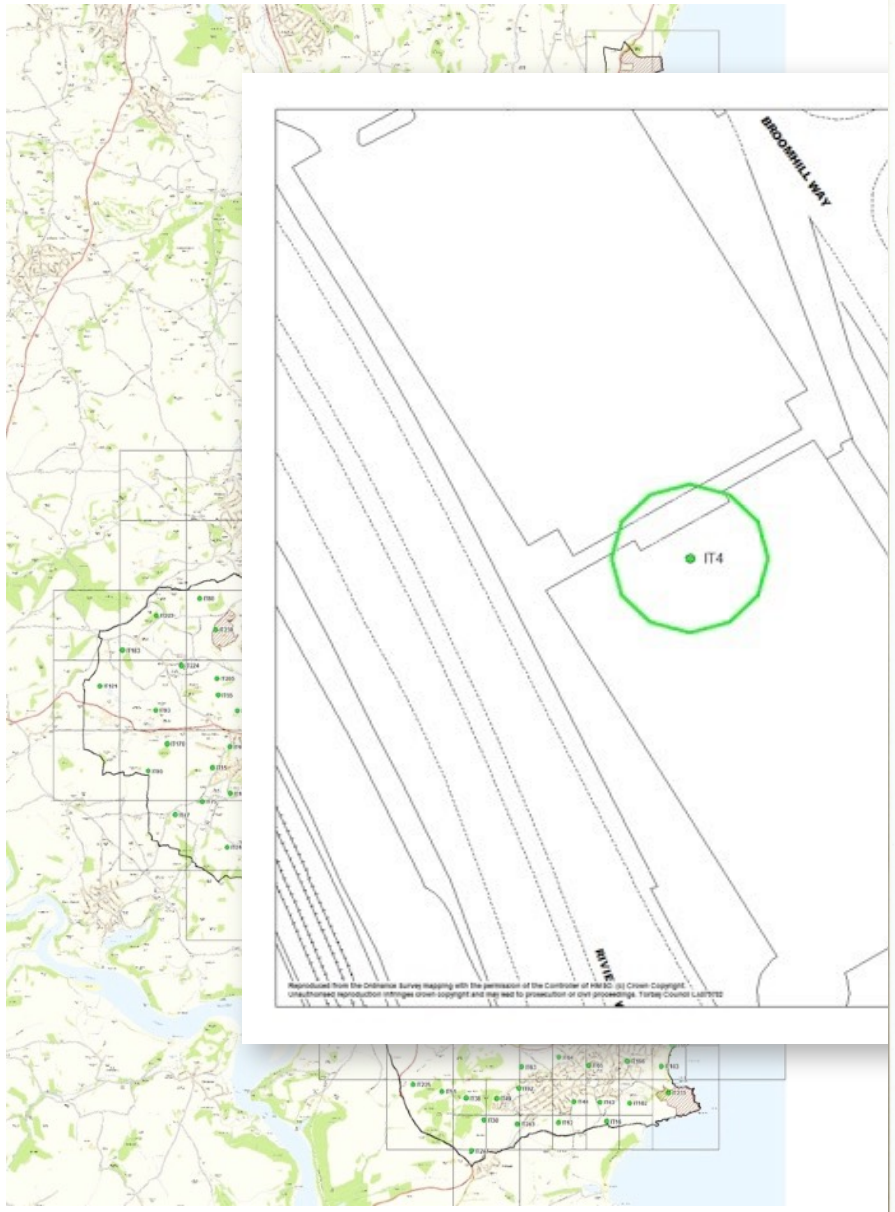
Treeconomics



TORBAY COUNCIL

Owner/ Occupier

Please reply to:
Tree Services, Residents & Visitor Services
2nd Floor, Tor Hill House, Union Street
Torquay TQ2 5QW
My Ref: NC/JP/iTree
Your Ref:
Telephone: 01803 207797
Fax: 01803 207981
E-mail: Trees@torbay.gov.uk
Date: 7 June 2010

Measuring the ecosystem services of Torbay's urban forest

i-Tree Eco Project

Dear Sir/ Madam

I am writing to inform you that Torbay Council will be conducting an urban tree inventory throughout 2010 utilising the i-Tree system developed by the US Forest Service. This project aims to quantify the composition (tree type, size, health etc) of Torbay's trees so that will may recognise the full range of environmental and socio-economic benefits provided by urban trees under current and future climate conditions.

Approximately 250 randomly distributed 1/10 acre sample plots have been identified throughout Torbay. One of these portions (or a portion thereof) is located on your property. We are requesting permission to access your property to collect information on trees within the sample plot including the tree type, size, crown coverage and density together with overall health. These measurements will not harm the trees in any way and only the trees within the plot will be measured. Please return the attached slip or email us indicating your permission for a Torbay Council employee or representative thereof to enter your property for this specific purpose.

If you have any questions or concerns, please contact Neil Coish, Arboricultural Service Manager on 01803 207977.

Yours sincerely

Neil Coish
Arboricultural Service Manager

Schools and services for children and young people • social care and housing • recycling, waste disposal and clean streets • community safety • roads and transportation • town planning • tourism, harbours and economic regeneration • consumer protection and licensing • leisure, museums, libraries and arts

If you require this in a different format or language, please contact me.

Printed on 100% recycled paper

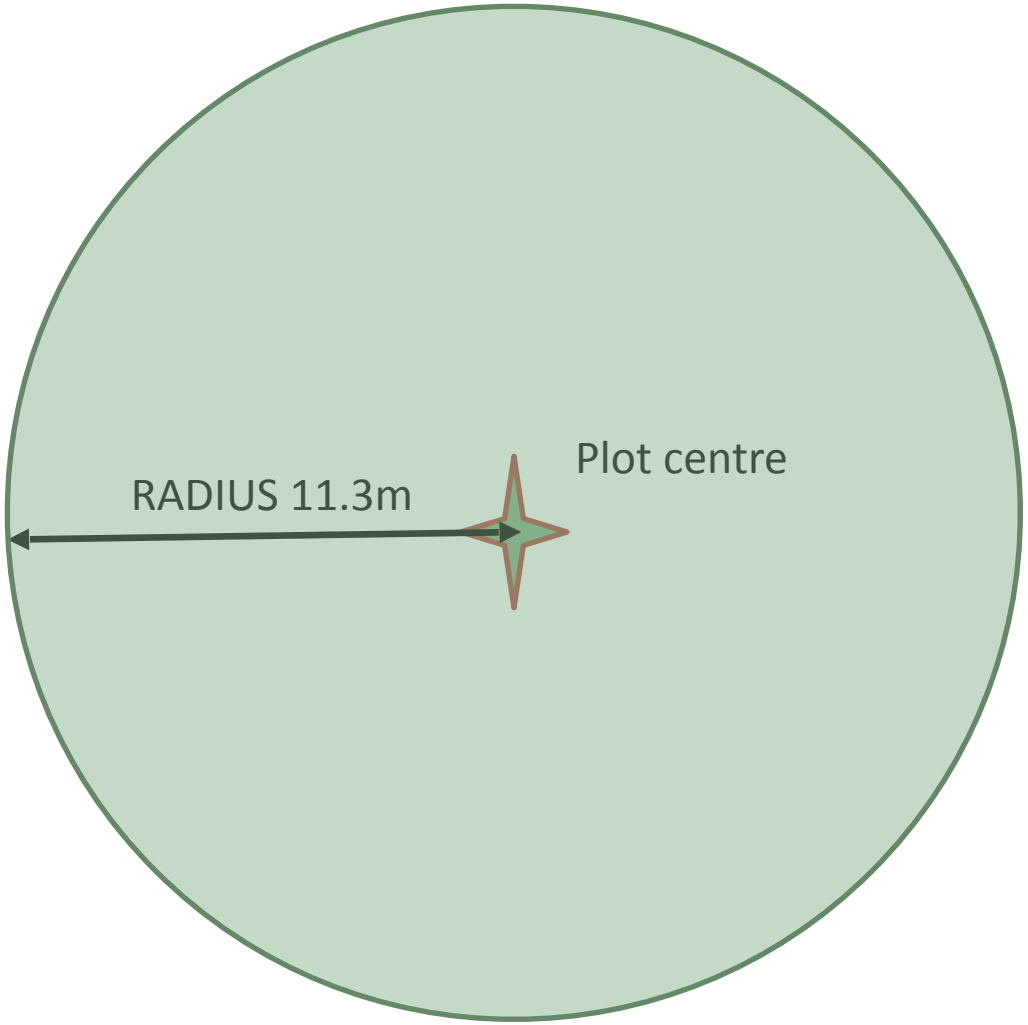
PIUS FLORIS BOOMVERZORGING

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

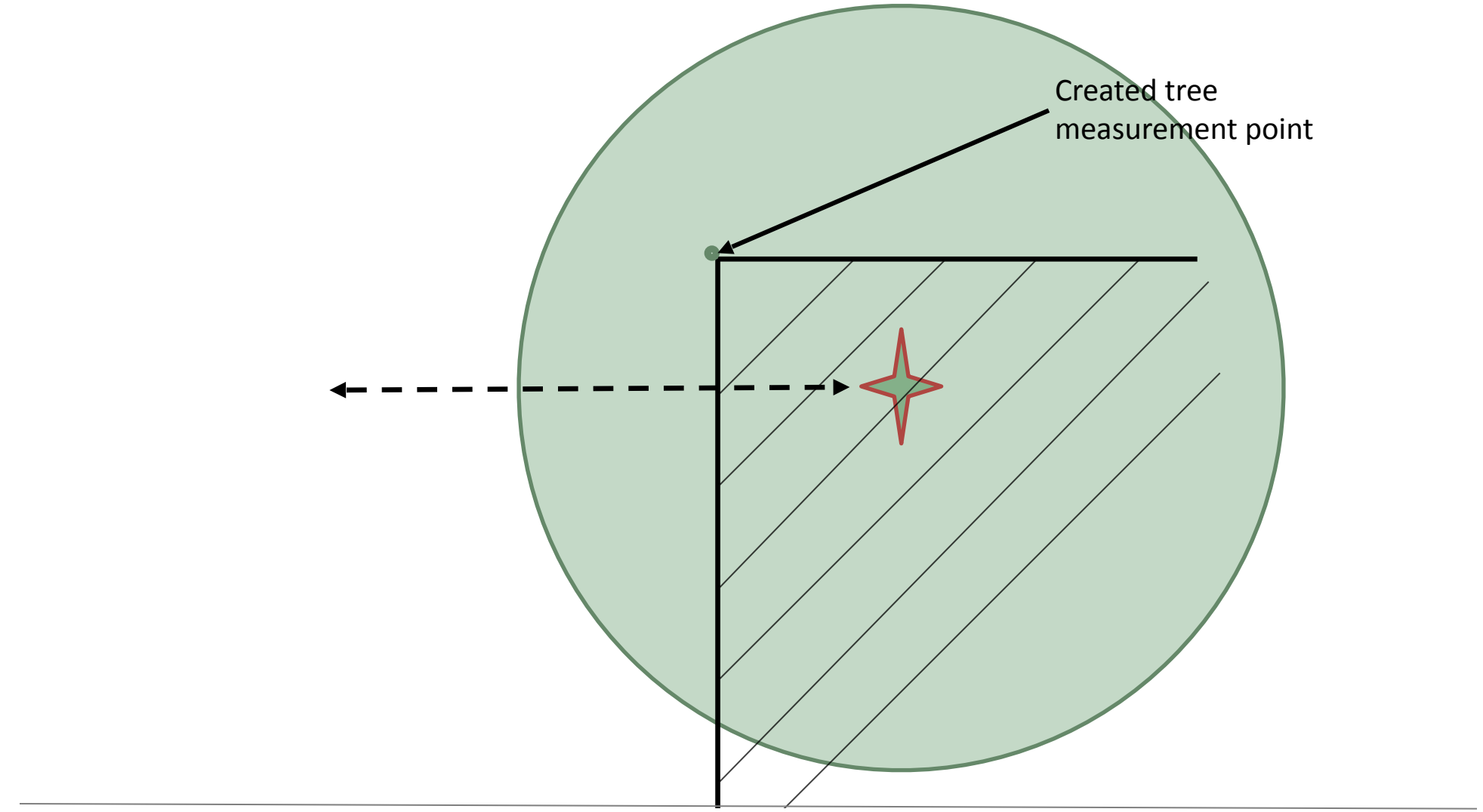
Trees & Design Action Group

Treeconomics

STANDARD I-TREE ECO PLOT

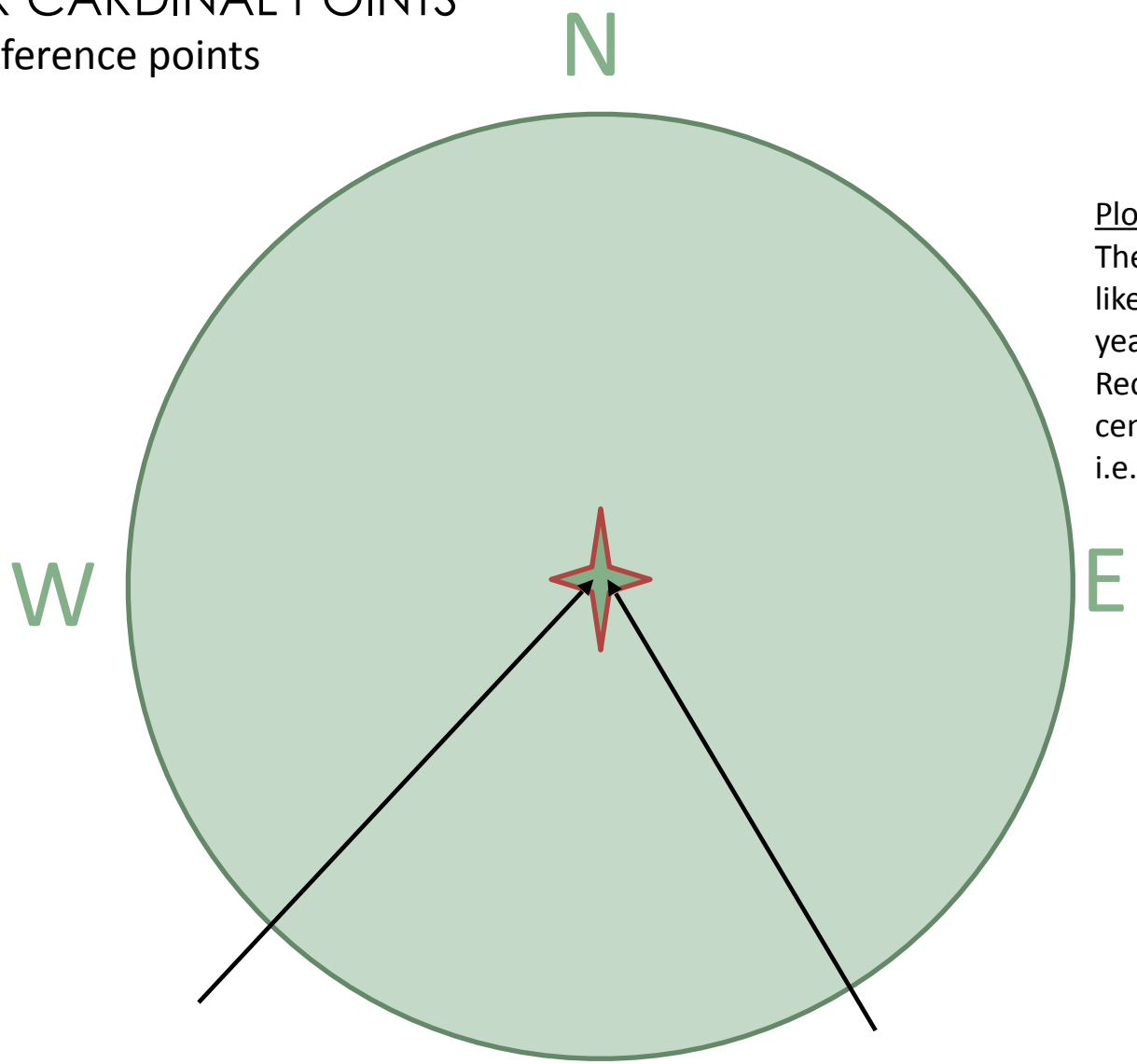


INACCESSIBLE PLOT CENTRE



FOUR CARDINAL POINTS

Plot reference points



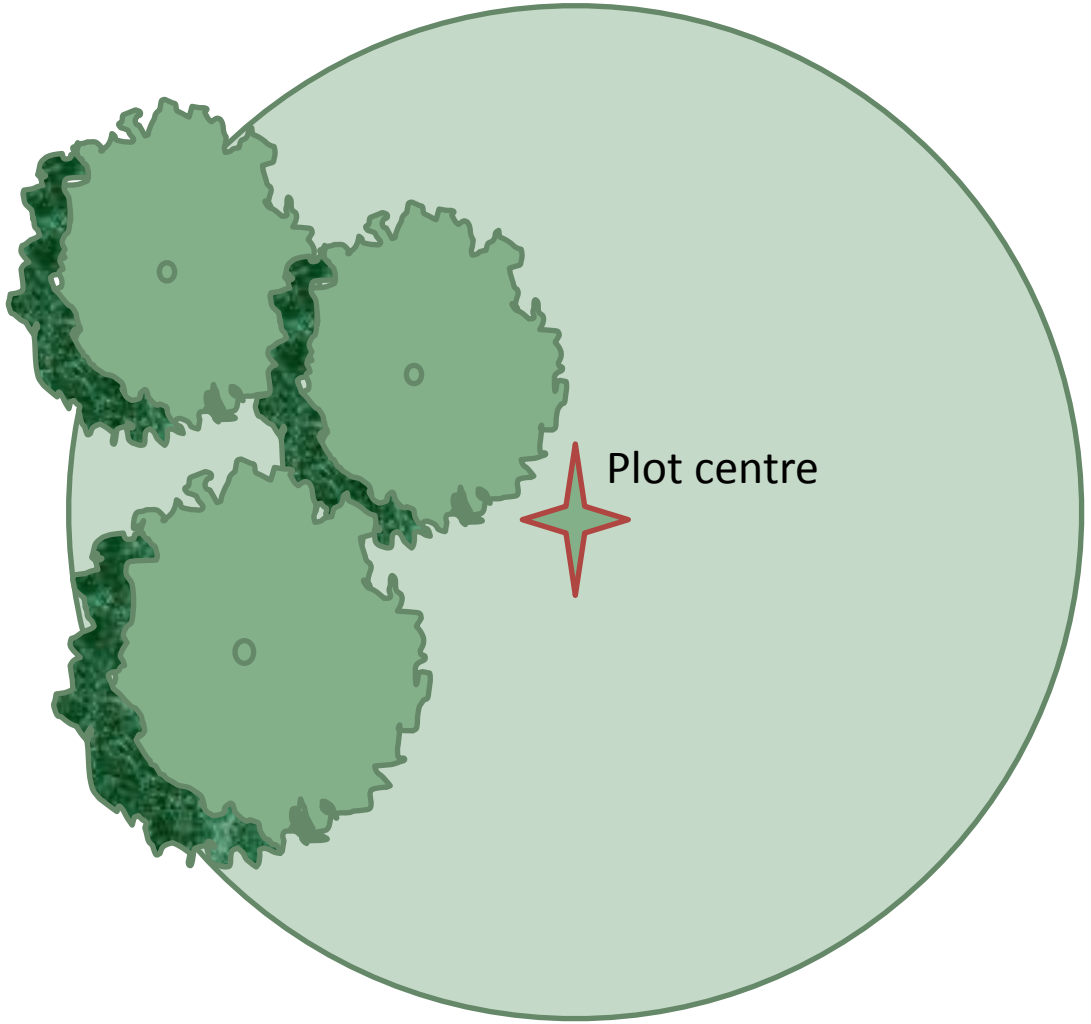
<u>Plot Reference Points A & B</u>

These are permanent objects likely to be present 10-15 years

Record distance from the plot centre and direction

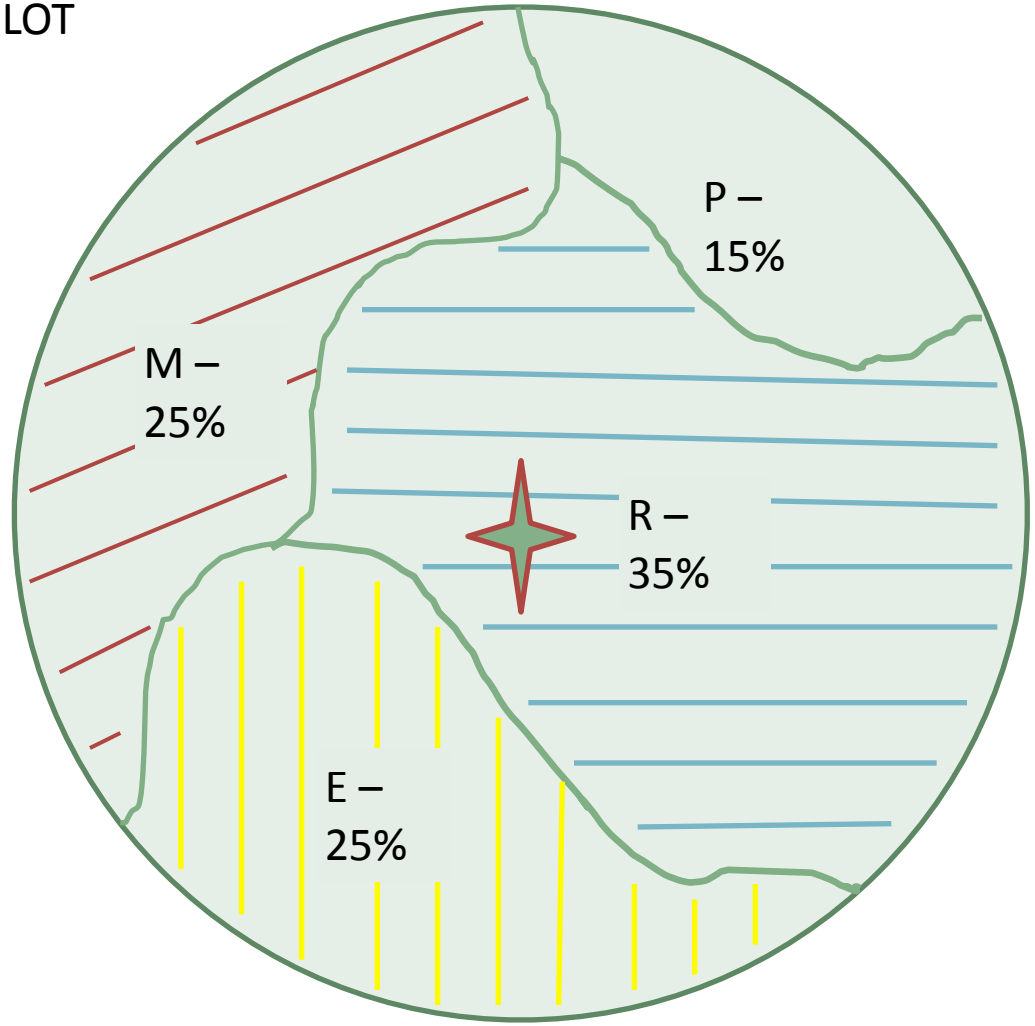
i.e. 15m - 360 °

PERCENTAGE PLOT COVERED BY TREE CANOPY
→ **PERCENTAGE PLANTABLE**



LAND USE CATEGORY

% OF ACUTAL PLOT

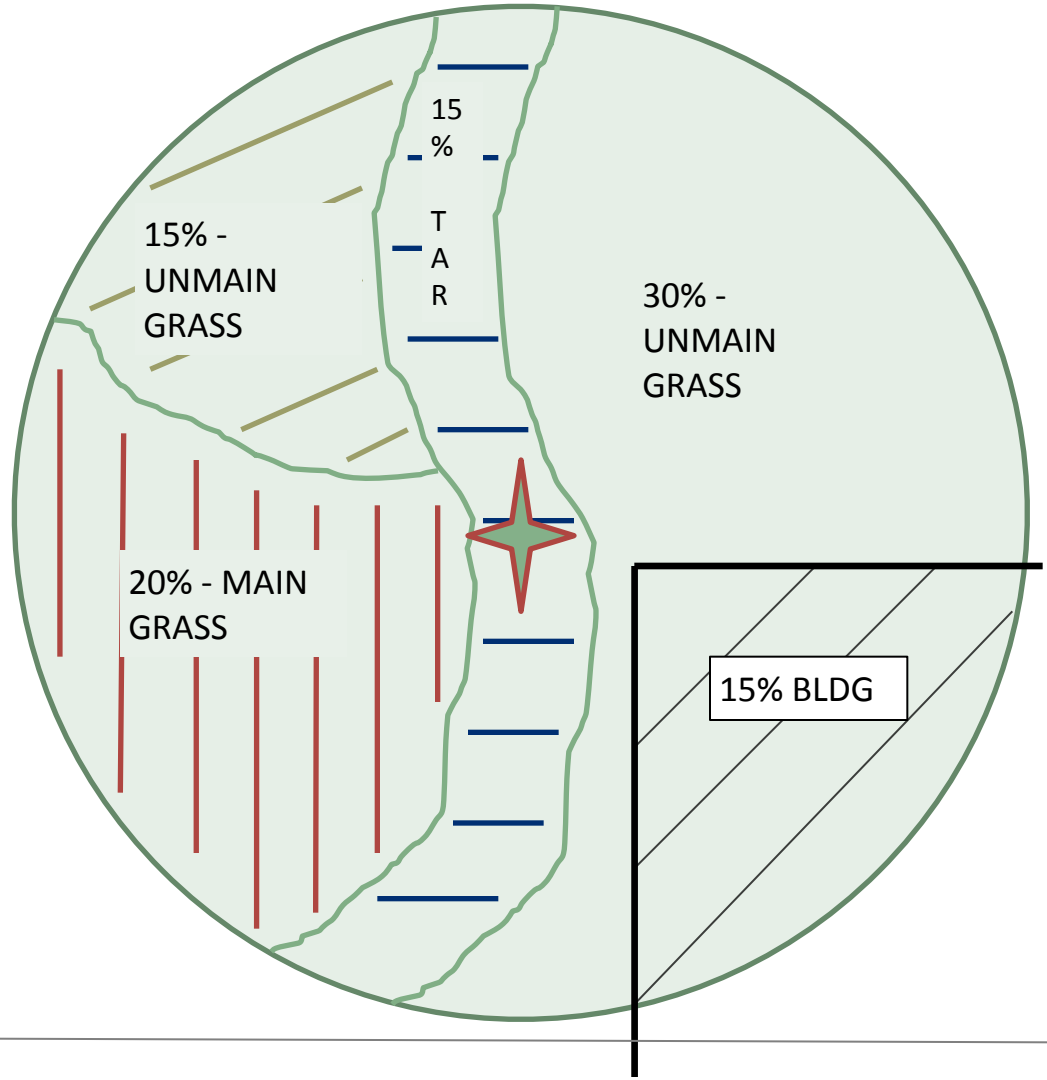


Land Use Types

Residential (R)
Multi family Residential (M)
Commercial Industry (C)
Park (P)
Cemetery (E)
Golf Course (G)
Agriculture (A)
Vacant (V)
Intitutional (I)
Utility (U)
Water/Wetland (W)
Transportation (T)
Other (O)

GROUND COVER

Not including trees and shrub cover



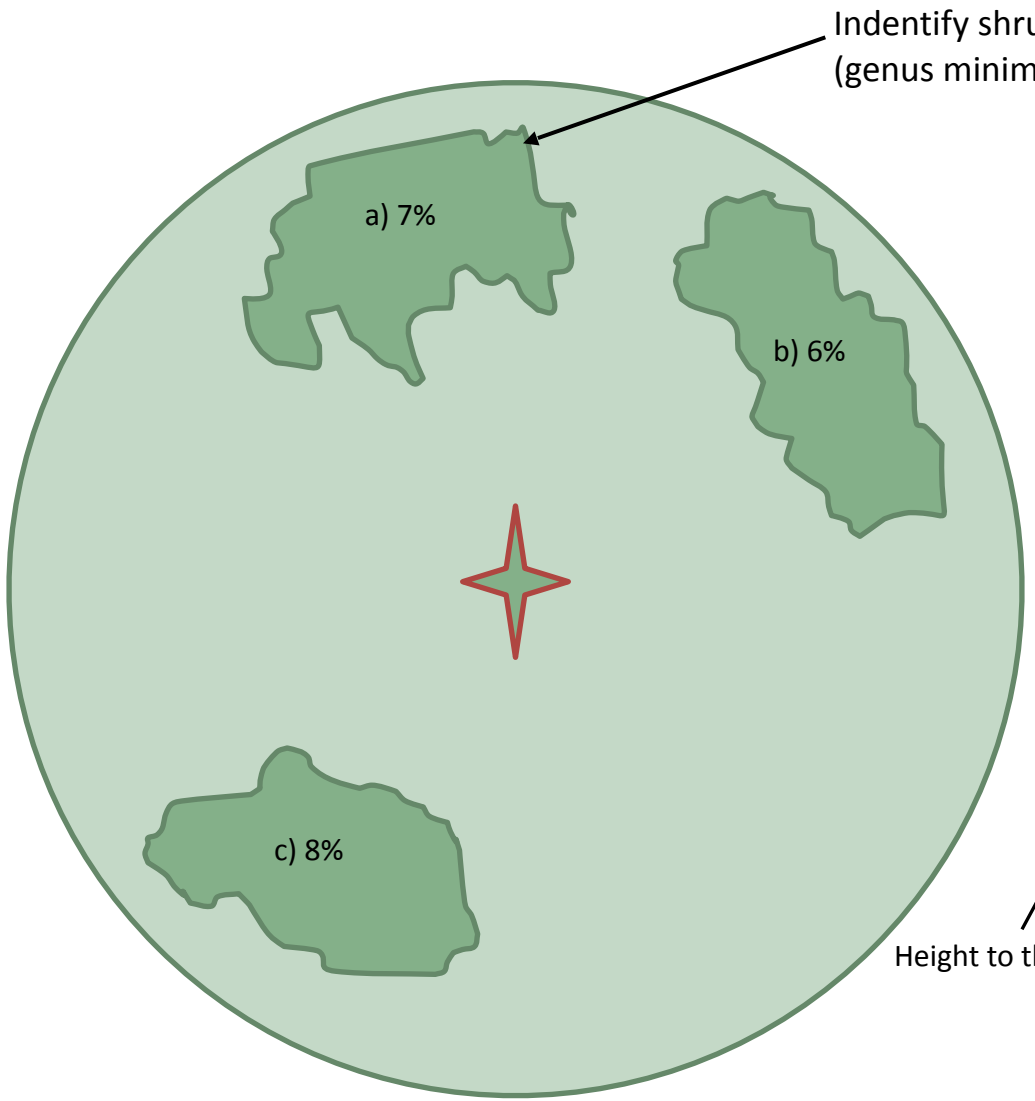
Ground Cover Categories

Building (% BLDG)
Cement (% CMNT)
Tar (% TAR)
Rock (ROCK)
Bare Soil (% SOIL)
Duff/Mulch (%DUFF/MULCH)

Herbs (% HERB/IVY)
Grass (% MAIN GRASS)
Unmaintained Grass (% UNMAIN GRASS)

Water (% H2O)

SHRUB LAYER



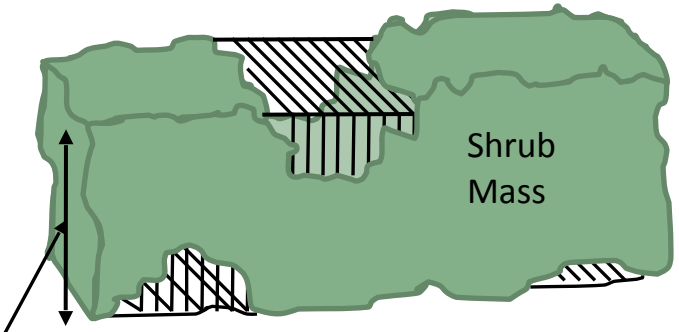
Key

% of shrub missing

% Plot area occupied by shrub area

a) 7%
b) 6%
c) 8%

Total: 17%



Height to the nearest .1cm

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Trees & Design Action Group

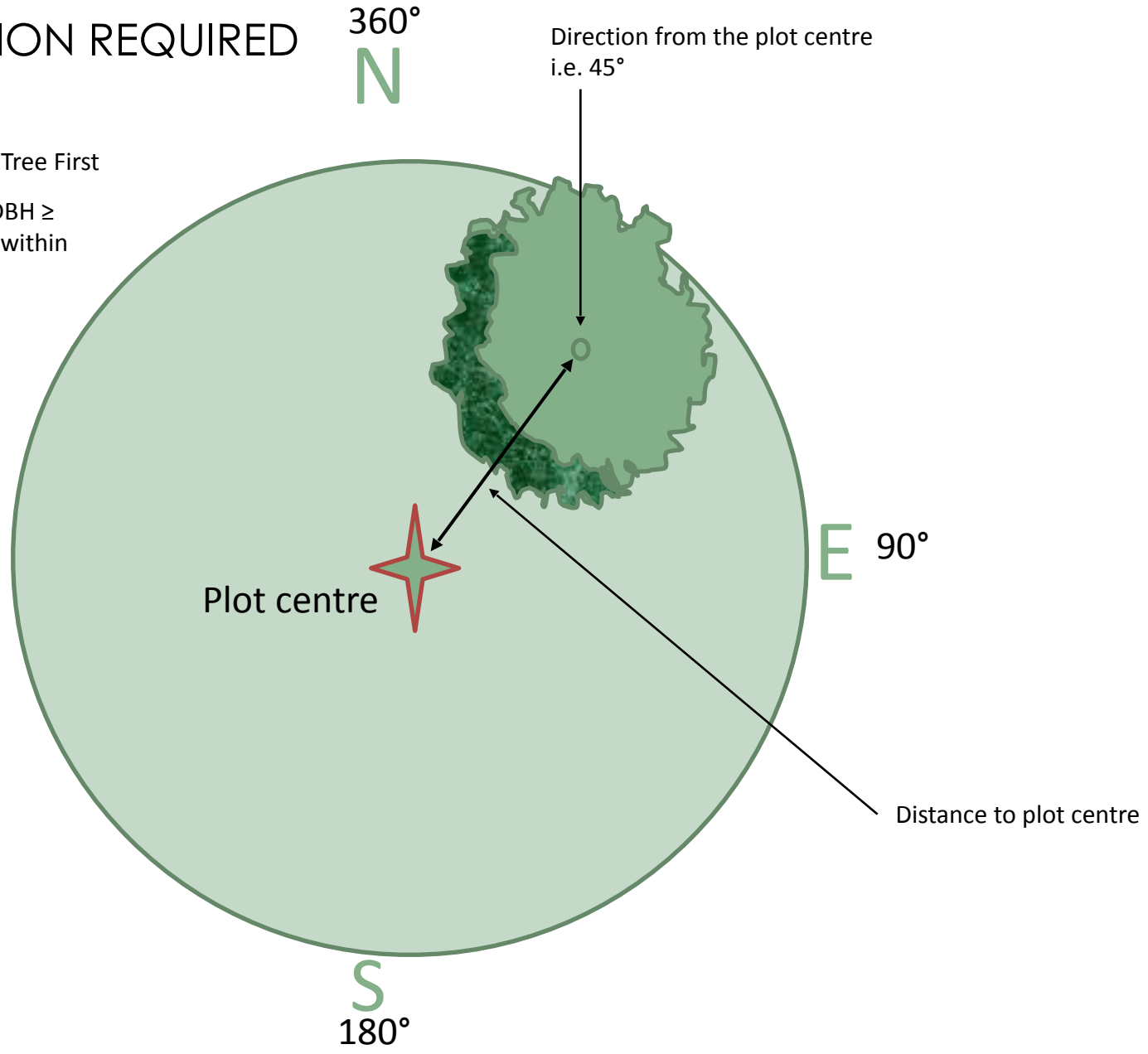
Treeconomics

TREE INFORMATION REQUIRED

Measurements -

* Start with farthest North Tree First

** Record all trees with a DBH ≥ 7cm if at least half trunk is within the plot area



Other observations

Land Use of the area the tree is situated

Genus

Species

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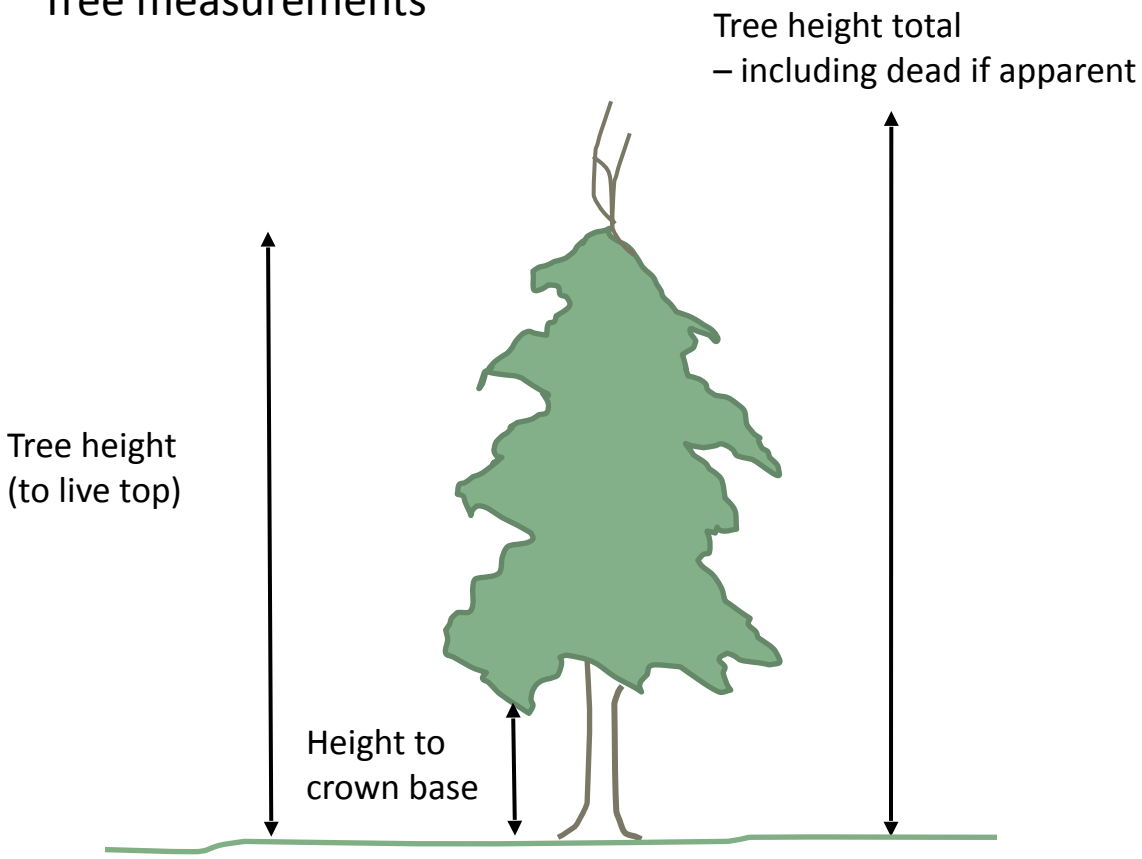
Coimisean na Coilltearachd Alba

Trees & Design Action Group

Treeconomics

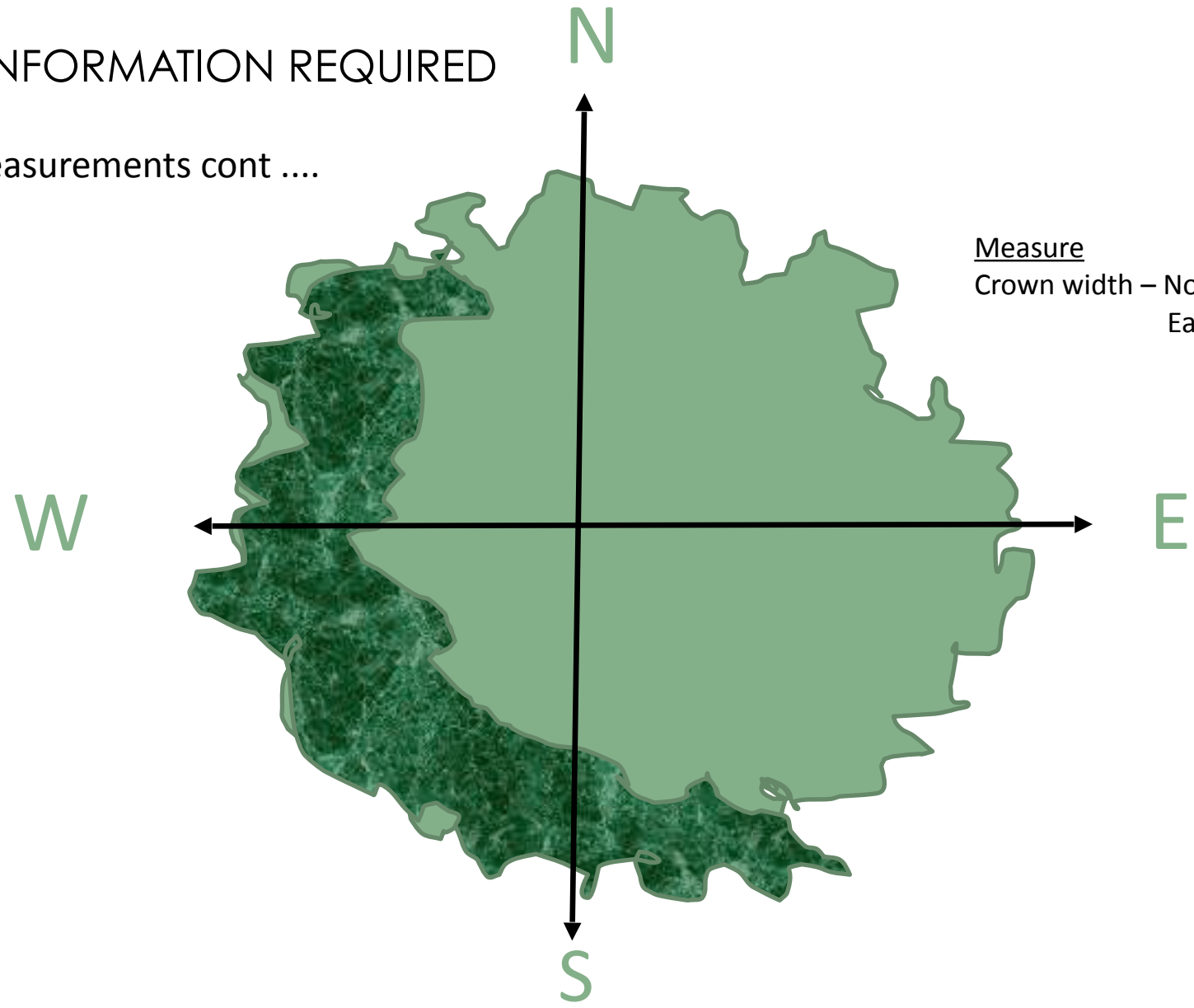
TREE HEIGHT

Tree measurements



TREE INFORMATION REQUIRED

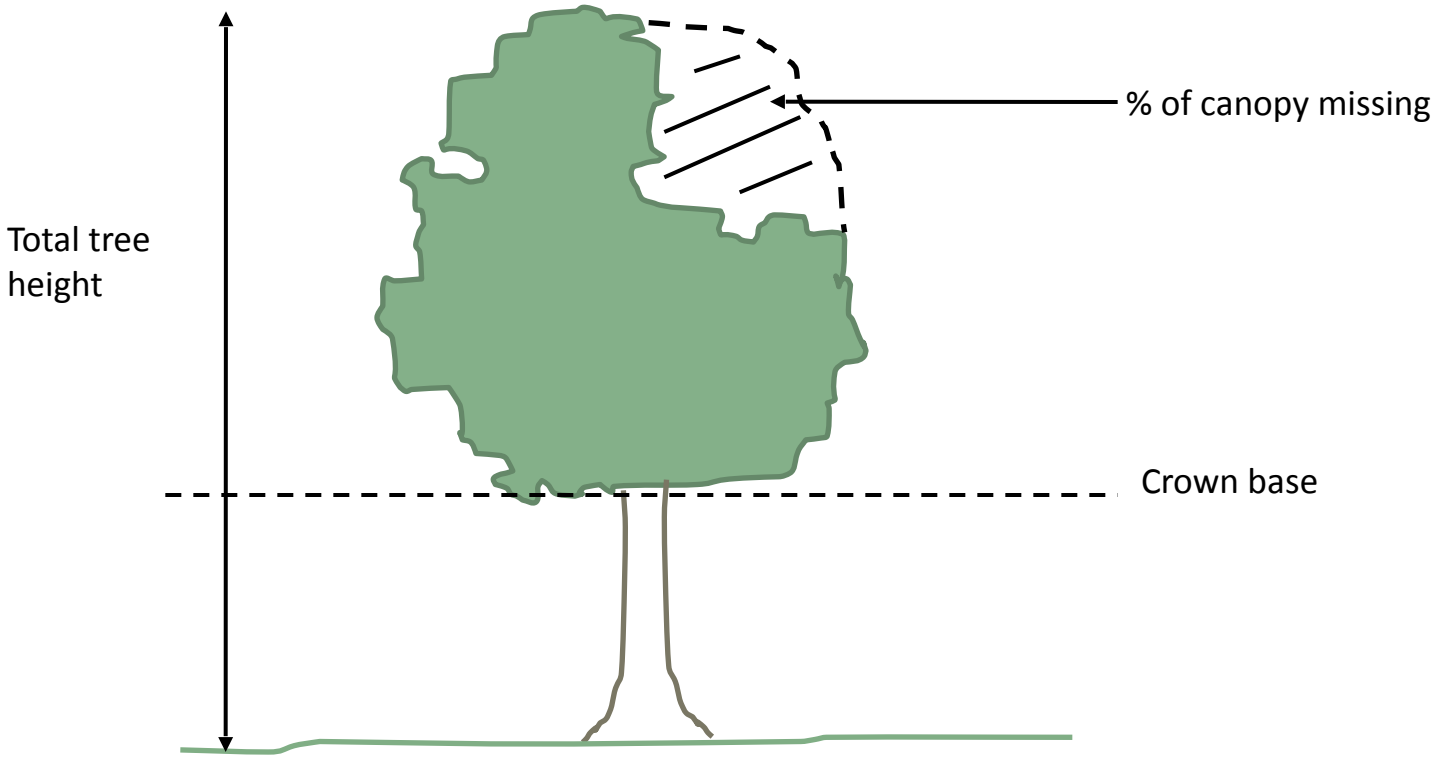
Tree measurements cont ....



<u>Measure</u>
Crown width – North to South
East to West

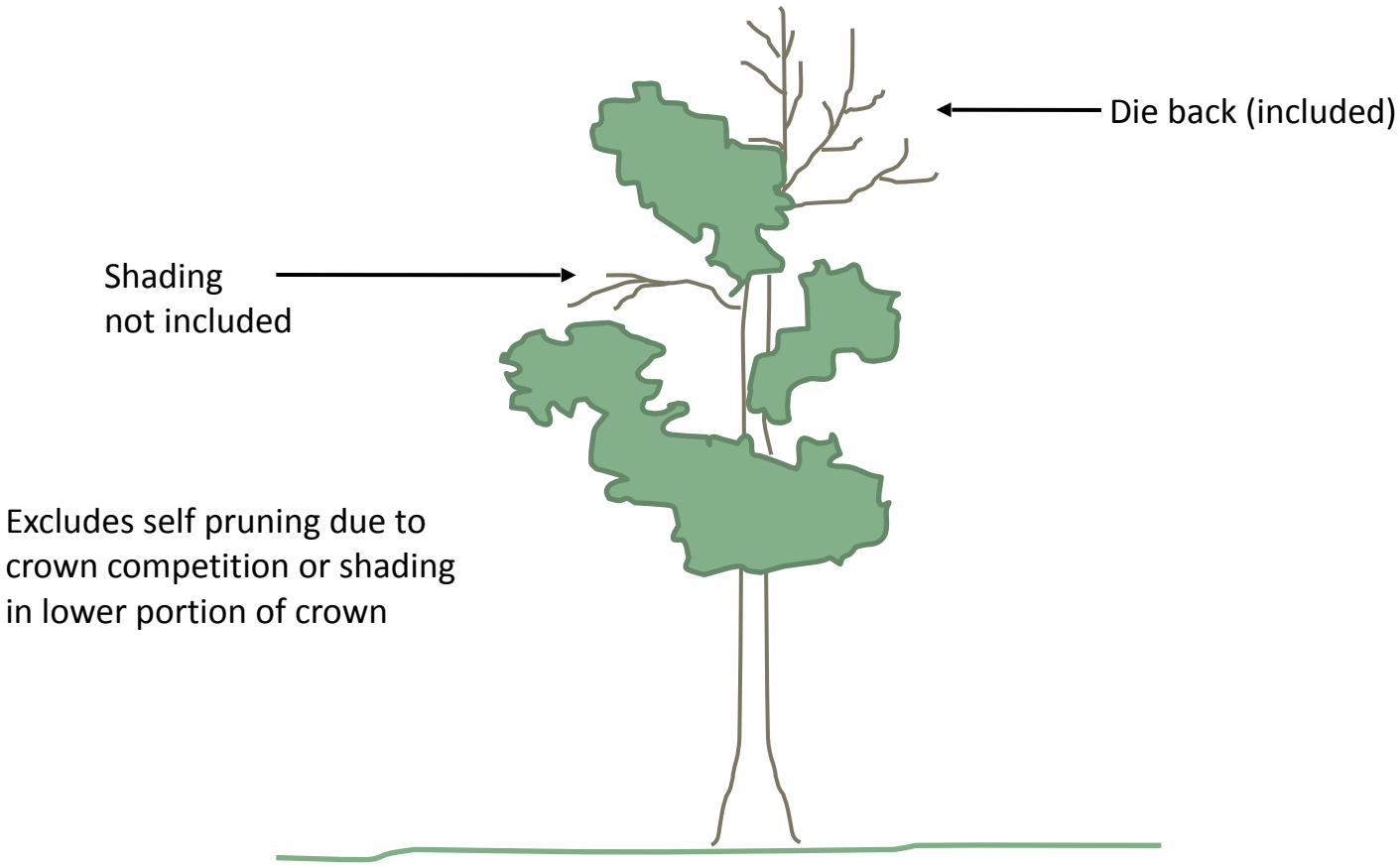
TREE INFORMATION REQUIRED_

Tree measurements cont ....



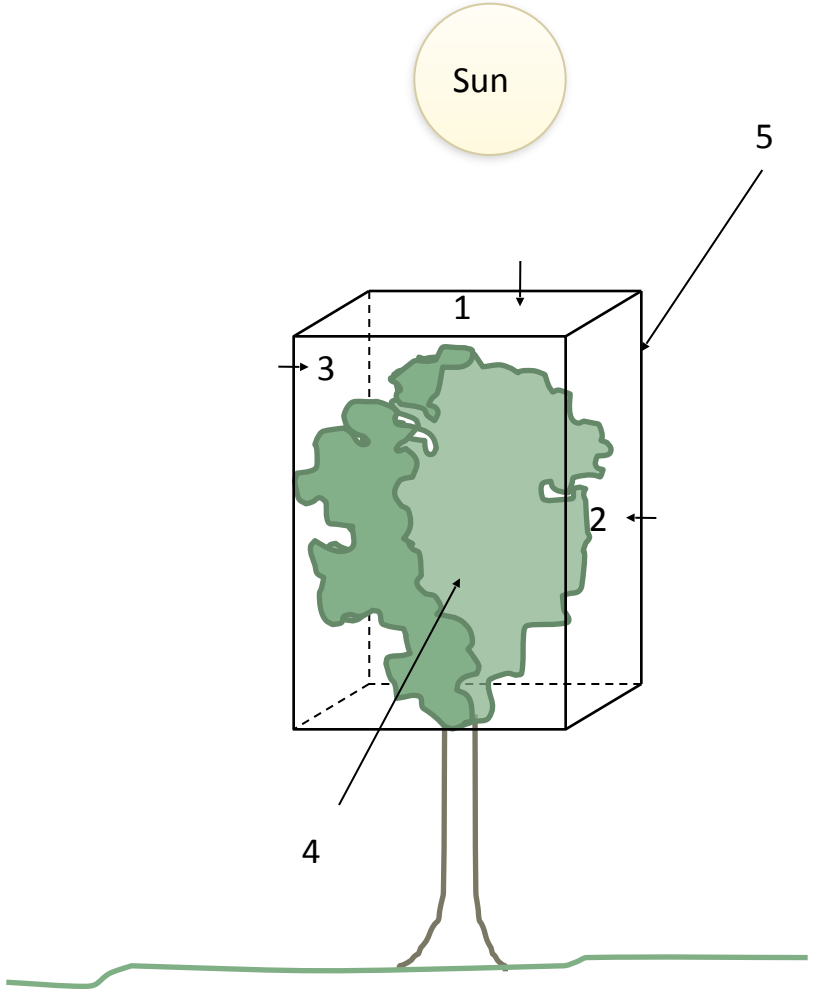
CROWN DIEBACK

Percentage die back in crown area



Excludes self pruning due to
crown competition or shading
in lower portion of crown

CROWN LIGHT EXPOSURE



The number of sides of the tree receiving sunlight from above.

The top of the tree is counted as one side.

0 – Tree Receives no full light

1 – Tree receives full light from the top or one side

2 – Tree receives full light from the top and one side (two sides without the top)

3 – Tree receives full light from the top and two sides (or three sides without top)

4 – Tree receives full light from the top and three sides

5 – Tree receives full light from the top and four sides