Replacement Local Development Plan 2018-2033

Background Paper

BP54: Tree cover in Conwy

Deposit Plan

October 2016

CONWY

Mae'r ddogfen hon ar gael yn Gymraeg hefyd.

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Cyfoeth Naturiol Cymru
Natural Resources Wales

Town Tree Cover in Conwy County Borough

Understanding canopy cover to better plan and manage our urban trees

Foreword

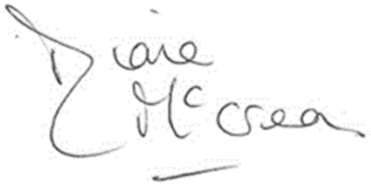
Emyr Roberts

Diane McCrea

Introducing a world-first for Wales is a great pleasure, particularly as it relates to greater knowledge about the hugely valuable woodland and tree resource in our towns and cities.
We are the first country in the world to have undertaken a country-wide urban canopy cover survey. The resulting evidence base set out in this supplementary county specific study for Conwy County Borough will help all of us - from community tree interest groups to urban planners and decision-makers in local authorities and our national government - to understand what we need to do to safeguard this powerful and versatile natural asset.

Trees are an essential component of our urban ecosystems, delivering a range of services to help sustain life, promote well-being, and support economic benefits. They make our towns and cities more attractive to live in - encouraging inward investment, improving the energy efficiency of buildings – as well as removing air borne pollutants and connecting people with nature. They can also mitigate the extremes of climate change, helping to reduce storm water run-off and the urban heat island.

Natural Resources Wales is committed to working with colleagues in the Welsh Government and in public, third and private sector organisations throughout Wales, to build on this work and promote a strategic approach to managing our existing urban trees, and to planting more where they will deliver the greatest benefits.



Dr Emyr Roberts
Chief Executive

Diane McCrea
Chair

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Rail Station - Rose Hill Street, Conwy

Acknowledgements

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The updated national 'Tree Cover in Wales' Towns and Cities' report and associated summary are available online at the Natural Resources Wales website.
For further information:
Email – **urbantrees@naturalresourceswales.gov.uk**

1. Introduction – Wales' canopy cover study

The 'Tree Cover in Wales' Towns and Cities' study is the first nationwide study of a whole country's urban area to be undertaken anywhere in the world. To compliment this 22 county reports provide specific local focus to the canopy cover findings. For Conwy County Borough this offers details for its 11 towns.

Start here to understand the context, objectives, audience, and future prospects of this work:

The '*Tree Cover in Wales' Towns and Cities'* study – providing the context for Conwy County Borough's canopy cover findings

1.1 The economic, social and environmental value of trees in our towns

It is now widely accepted that trees and woodlands in and around towns and cities have a vital role to play in promoting sustainable communities. In the last few years a growing body of research has demonstrated that trees bring a wide range of benefits both to individual people and to society as a whole.

As the most important single component of green infrastructure, trees can contribute to improved health and wellbeing, increased recreational opportunities, and an enriched and balanced
environment that ultimately boosts a town's image and prosperity.

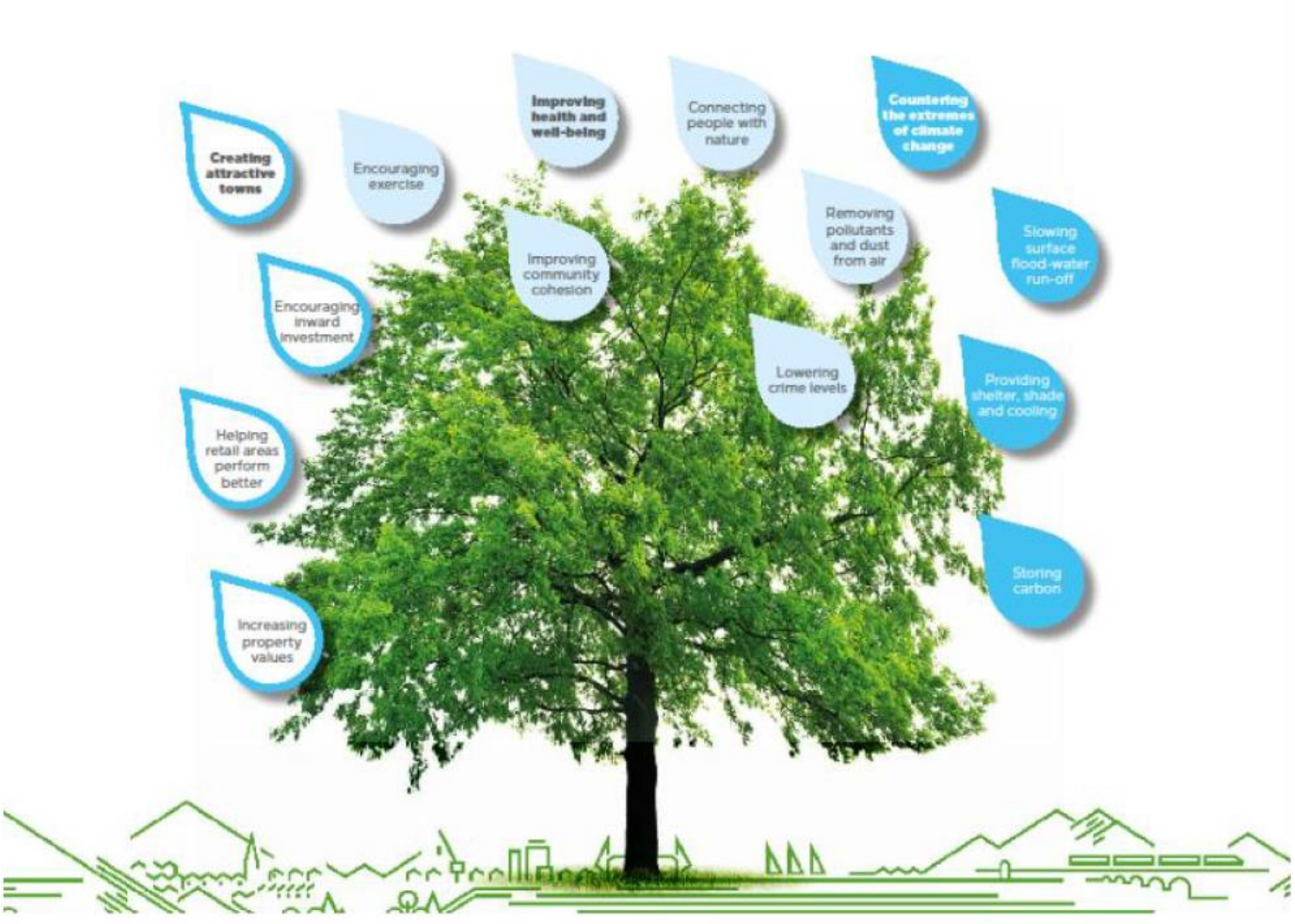


Figure 1: Trees are powerful and versatile natural assets

1.2 Why a 'Tree Cover in Wales' Towns and Cities' (TCWTC) Study?

Trees are a shared resource and are amongst the most versatile natural assets planners, policy makers, businesses and communities can use to cost effectively raise the quality of Welsh towns and cities.

In spite of this potential, very little is known about Wales' urban tree resource. Nobody knows how much there is, where it falls, and whether current provisions are adequate to effectively support the sustainable growth, health and wellbeing of Welsh urban communities. Despite their multi-purpose benefits to society the urban environment places considerable pressure on trees, with the reasons for their potential removal and loss of cover varied.

1.3 Who is this study for?

The Tree Cover in Wales' Towns and Cities (TCWTC) study was designed to help address this knowledge gap and **provide decision-makers around the country, including Conwy County Borough Council, with the baseline information they need to strategically plan and manage Wales' urban tree resource.**

The TCWTC study makes a significant contribution to building understanding and capacity for effective national coordination of urban green infrastructure delivery. Its findings will be of interest to both policy makers and practitioners, particularly those in the Welsh Government, Natural Resources Wales and their Public Service Board representatives, local authorities such as Conwy County Borough Council, Registered Social Landlords, e.g. Cartrefi Conwy and other significant land owners in urban areas, e.g. Dŵr Cymru / Welsh Water, University campuses and non-governmental bodies.

This supplementary county report provides detailed findings in the form of maps, tables and charts and are presented in a similar format as to what is presented in the national TCWTC study sections. To gain a greater understanding behind the county results this report should be read in conjunction with the more detailed analysis found in the national study. Further analysis is needed to tease out the particular characteristics and trends of canopy cover within each county.

1.4 How was the study developed? An overview

Because it is mostly through their crown spread that trees deliver benefits, the TCWTC study focuses on tree canopy cover (rather than counting individual number of trees). This was mapped through a desk-based analysis of 2006, 2009 and 2013 aerial photographs for Wales' 220 urban areas as defined by the Office of National Statistics' settlement based approach.

Wales is the first country in the world to undertake a complete canopy cover study of all its urban areas.

The findings of non-woodland 'amenity' trees were complemented by existing datasets on urban woodland (>0.5 hectares), using National Forest Inventory data. The analysis conducted at multiple scales (county, town and ward level) also considered the relation between canopy cover and local levels of deprivation.

1.5 A portrait of Wales' and Conwy County Borough's urban tree canopy

Urban canopy coverage

Wales' mean urban tree cover was estimated to be 16.3% for 2013, down from 17.0% in 2009. Conwy's urban cover was estimated to be 13.8% in 2013, down from 14.6% in 2009.

High differences from town to town

Behind national figures, landscape character influences the noticeable differences that exist - often low in coastal towns (e.g. Rhyl and Porthcawl – 6%) and high in the South Wales Valleys (e.g. 30% in Treharris). Conwy has the 5th lowest canopy cover, influenced to a degree by its coastal character. But there are distinct contrasts with Conwy, Llanfairfechan and Penmaenmawr displaying between 22% - 24%, even the sizeable Colwyn Bay has 18% with Llandudno (7.7%) and Towyn/ Kinmel Bay (6.45) especially low on cover.

Nationally one third urban woodland, two thirds amenity trees

Urban woodlands represent 35% of Wales' urban canopy cover, however in Conwy it is 30%. The rest is made up of so-called 'amenity' non-woodland trees, those individual and groups of trees growing along streets, gardens, car parks and other urban public and private open spaces.

Distribution of canopy amongst land uses tells a great deal about urban tree stewardship

Public open space hosts 53% of all tree cover in our Welsh communities despite making up only 22% of urban land. This is 43% in Conwy, where public open space accounts for 20% of urban land.

Private residential gardens make up 35% of Wales' urban areas and provide 20% of all our town's tree cover. This rises to 43% in Conwy with gardens providing a notable 32% of all canopy.
This underlines the responsibility of homeowners, and the importance of the good use and management of tree preservation orders to the upkeep of the Welsh urban forest. It also highlights the responsibility of developers and planners as part of the development process to ensure our housing areas are all adequately canopied.
Transport routes - including verges and pavements - make up 16% of Wales' urban land but they only provide 9% of cover, 19% and 11% respectively in Conwy. Motorised traffic causes much of the urban air and surface water pollution, which trees have the ability to remove.

Tree canopy loss

Overall towns in Conwy lost 25 hectares between 2009 and 2013 with eight of the 11 towns showing a decline in cover. A similar picture exists across Wales with 159 of 220 urban areas showing loss of cover.
When comparing loss and gain of trees between 2006 and 2013, 7,000 large trees appear to have been lost across Wales – however 191 appear to have been recruited from medium-sized trees in Conwy. Nationally the findings suggests a steady erosion of Wales' Victorian and Edwardian tree legacy.

Tree cover in deprived areas tends to be lower and relatively less rich in amenity trees

Whilst variation exists across Wales, 63% of more affluent wards have cover greater than 15% compared to 23% for less well-off wards. There is however great variation in tree cover within Wales' top 10 most deprived wards (2014), from as little as 2% in Rhyl West 2 to 19% in Merthyr Vale 2, Aberfan. Whilst three of the 13 wards (LSOAs) in the Conwy Communities First cluster area have cover greater than the national average (Glyn 3 – 26%), seven have as low as 2%-4% e.g. Kinmel Bay 1 and Mostyn 1 are both on 2%.

Where high tree cover and high level of deprivation coexist, this seems to be associated with local urban woodland being present rather than amenity trees. Woods of this nature can sometimes be unmanaged and inaccessible.

Potential for tree cover

'Green land' sites (soil, grass and shrub areas) were assessed for potential planting, piloting one major town in each local authority, e.g. Conwy itself.
If all 'green land' sites identified were planted, with the right trees in the right places, cover in towns could potentially increase by 40%.

Knowing where trees might be planted enables planners to set realistic canopy cover targets. Many North American and Australian cities have comprehensive tree strategies with tree canopy cover goals. Portland in Oregon, with a similar climate to Wales, intends to increase its cover by 7% from its current level of 26%. Bristol City Council has set an aspirational goal of increasing canopy cover from 14% to 30%.
If Welsh towns with lower cover aimed for 20% (the UK Forest Standard woodland definition) in the medium term – we could have a nation of woodland towns!

1.6 The way ahead. What we can all do

Share and build the evidence

What gets measured gets managed. The study has addressed a significant information gap. It's crucial that we continue to share findings and continue the research.

Adopting a strategic approach to managing our urban trees

The study has identified significant discrepancies in canopy cover levels between and within individual towns. International best practice shows that the best way to ensure all urban communities achieve adequate canopy cover is to adopt local tree strategies and set canopy cover targets.

Supporting sustainable urban tree management

Significant rates of tree loss have been identified. It's crucial that we all review the effectiveness and use of existing tools and legislation for tree care and preservation and ensure that the potential of grant programmes is maximised to support Wales' urban treescape.

Llandudno: © Crown Copyright: RCAHMW

2. Conwy - County and town canopy cover findings

This section presents headline findings on canopy cover extent.
Facts, figures and conclusions are provided in the following sequence:

2.1 Conwy County Borough's cover
2.2 Town canopy cover comparisons
2.3 Summary: actionable findings

2.1 Conwy County Borough's cover

Conwy County Borough's mean canopy cover for 2013 was estimated at 13.8%, totally 485 hectares – down from 14.6% in 2009.

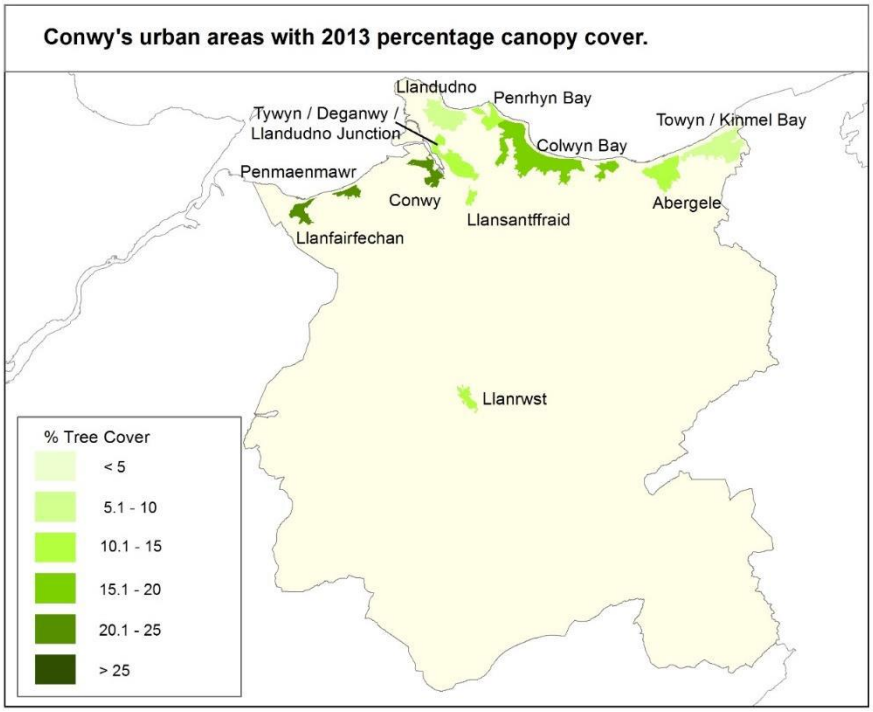


Figure 2: Conwy County Borough's urban areas with their 2013 canopy cover percentage

2.2 Town canopy cover comparisons

Urban Area Size (ha) Category

0-250	251-500	501-1000	1001-5000	>5000

Canopy Cover Size Classes

0-5%	5.1-10%	10.1-15%	15.1-20%	20.1-25%	>25.1%

National Area Size Rank	Urban Area	Landscape Character Zone	Population ONS 2011 Census	Urban Area (ha)	Total Cover '13 (ha)	Total Cover '13 (%)
17	Colwyn Bay	Coastal	29,405	1100	197	17.9%
38	Towyn / Kinmel Bay	Coastal	9,497	512	33	6.4%
53	Llandudno	Coastal	15,371	392	30	7.7%
55	Abergele	Coastal	9,208	362	42	11.6%
56	Tywyn / Deganwy / Llandudno Junction	Coastal	10,658	354	40	11.3%
91	Conwy	Coastal	3,873	203	45	22.2%
98	Penrhyn Bay	Coastal	4,432	168	20	11.9%
109	Llanfairfechan	Coastal	3,637	152	36	23.7%
140	Llanrwst	Hinterland	3,323	112	13	11.6%
158	Penmaenmawr	Coastal	2,535	93	21	22.6%
200	Llansantffraid	Coastal	1,735	54	8	14.8%

Table 1: Town size and canopy cover

2.3 Summary: actionable findings

Setting canopy cover targets

The review of experiences on the international stage demonstrates that adopting canopy cover targets helps to drive urban tree management. The national findings on mean canopy cover provide a useful benchmark for local planning authorities across the country to use in support of their local planning efforts.

Under the UK Forest Standard 20%, tree cover constitutes woodland. This could be applied to urban areas as to whether they attain 'woodland town' status.

Priority towns for adoption of a strategic approach to canopy cover increase

Apart from the number of people affected by low tree canopy provision, other factors to consider when identifying canopy cover needs include deprivation, air quality and flood issues.

- Neighbouring coastal towns demonstrate what can be achieved. The low levels of tree cover in Llandudno, Towyn / Kinmel Bay and elsewhere merit a planned approach to improve canopy provision for the future socio-economic well-being of those communities.

The ward-level analysis provides further insight where targeted tree planting might be needed. This is addressed in Section 4.

Optimising funding tools facilitating delivery

The strategic delivery of the canopy cover objectives set for a local area will be greatly facilitated if existing funding streams supporting the delivery of a high quality environment and infrastructure across urban Wales integrate tree-related measures as an eligible expenditure. For example: Vibrant and Viable Places, Coastal Communities Fund, Business Improvement District Fund Wales, Regional Transport Consortia Grant, Safe Routes in Communities, etc.

In line with this, NRW will ensure that its own grant schemes are open to urban tree and woodland proposals as far as possible.

Abergele: © Crown Copyright: RCAHMW

3. Distribution, composition and change to canopy cover

This section focuses on the distribution, composition and changes to Conwy County Borough's urban forest. It considers:

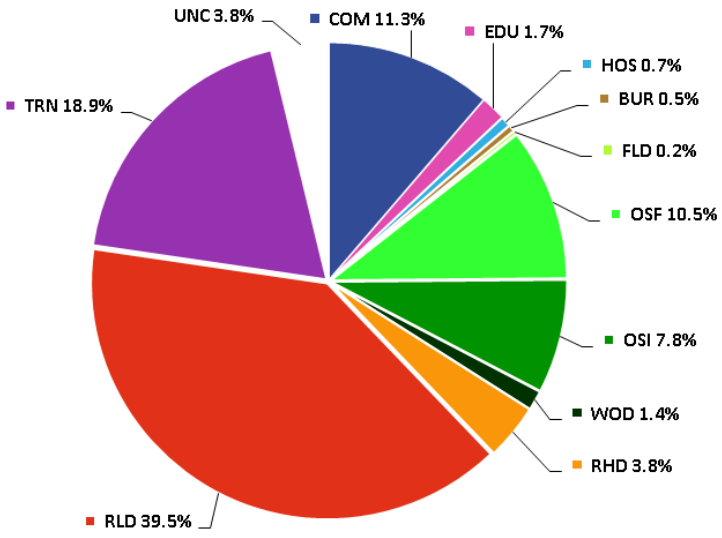
3.1 Urban canopy cover distribution across land-uses
3.2 Balance between urban woodland and amenity trees
3.3 Monitoring the extent of urban tree canopy over time - losses and gains
3.4 Summary – actionable findings

3.1 Urban canopy cover distribution across land-uses

Land Use Category	Total Land-use: hectares	TCWTC 2013 Canopy Cover: hectares
Commercial Areas (COM)	395.68	39.17
Education (EDU)	59.10	8.31
Hospitals (HOS)	25.08	9.48
Burial (BUR)	16.58	3.97
Remnant Countryside (FLD)	8.59	0.72
Formal Open Space (OSF)	366.47	64.61
Informal Open Space (OSI)	273.32	95.24
Woodland (WOD)	47.47	47.47
High Density Residential (RHD)	134.27	3.87
Low Density Residential (RLD)	1383.60	152.28
Transport Corridors (TRN)	662.22	54.17
Un-Classified Land-Use (UNC)	132.58	6.28
TOTAL	3504.95	485.58

Table 2: Canopy cover within each land-use for the 11 towns

Conwy land-use 2013



Conwy canopy cover per land-use 2013

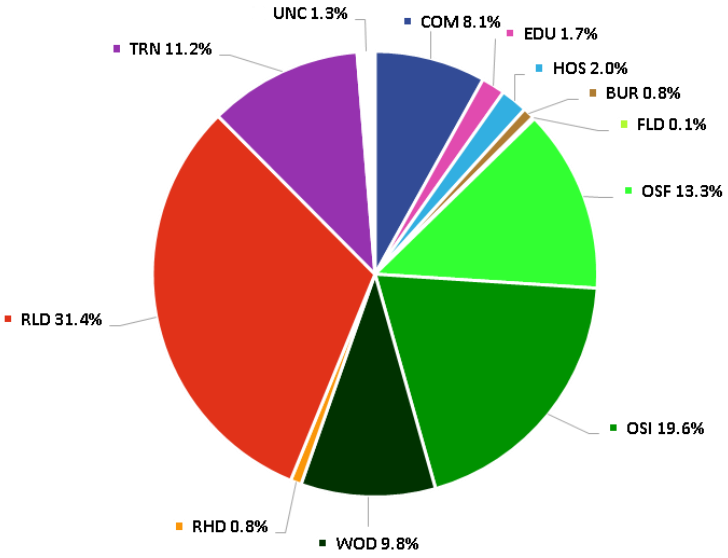


Figure 3: Distribution of the 12 land-use categories (2013) across Conwy's urban areas

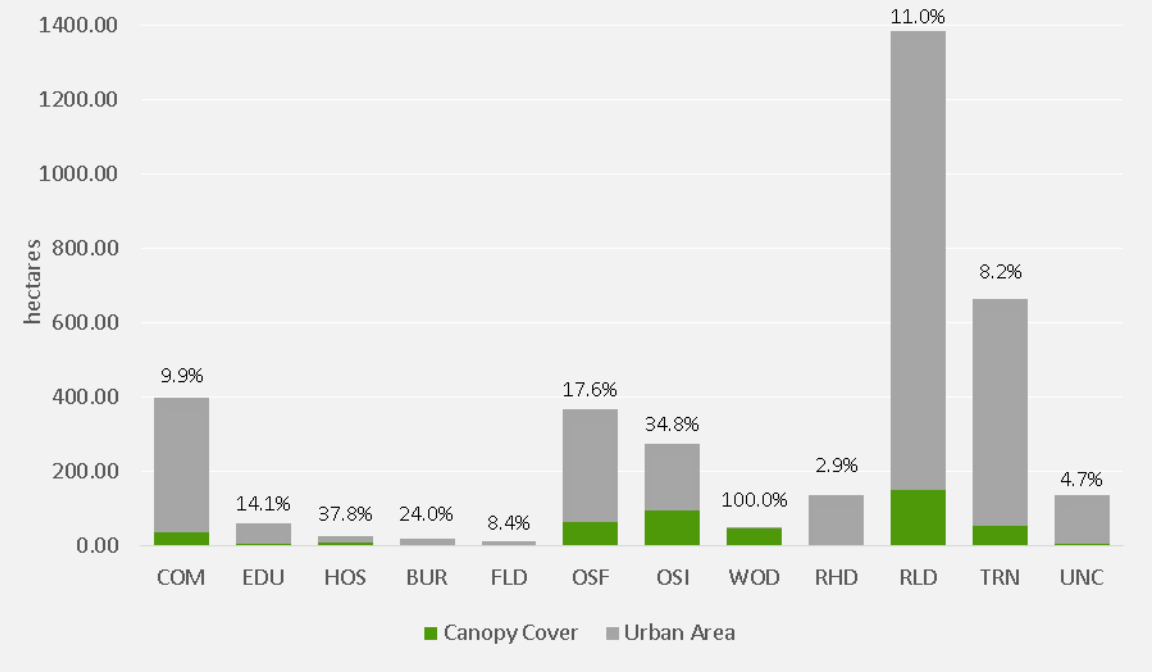


Figure 4: The Percentage Contribution of Canopy Cover within each Land-Use

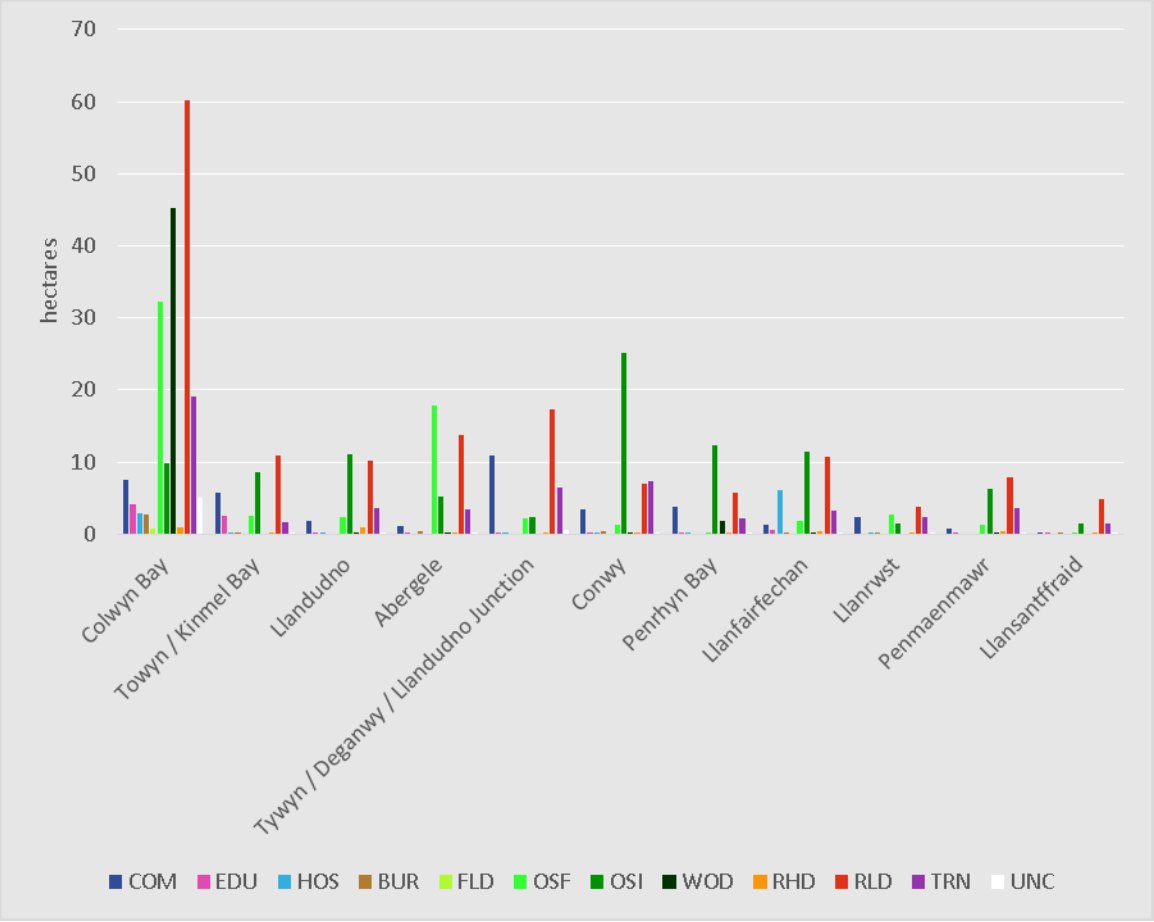


Figure 5: Land-Use Canopy Cover Distribution within Conwy's Towns

Land-use distribution of canopy cover within wards (LSOAs)

Ward (LSOA) with WIMD (Cluster Area Ward highlighted)	Total Ward Area (ha)	Town Area in ward (ha)	COM (ha)	EDU (ha)	HOS (ha)	BUR (ha)	FLD (ha)	OSF (ha)	OSI (ha)	WOD (ha)	RHD (ha)	RLD (ha)	TRN (ha)	UNC (ha)	Total Cover TCWTC 3 (ha)
Abergele															
Abergele Pensarn	234.59	46.9	0.11	0	0	0	0	0	1.03	0	0.02	0.53	0.56	0	2.25
Gele 1	951.92	29.37	0.03	0	0	0	0	0.34	0.34	0	0.05	1.84	0.16	0.01	2.78
Gele 2	47.41	47.36	0.07	0	0	0.06	0	0.38	0.38	0	0.02	1.89	0.47	0.01	3.27
Gele 3	274.63	106.59	0.25	0	0	0.08	0	11.79	1.77	0.02	0.02	4.12	0.76	0	18.82
Pentre Mawr 1	63.48	60.83	0.34	0.24	0	0.17	0	4	0.34	0.01	0.12	2.29	0.58	0	8.1
Pentre Mawr 2	102.29	70.94	0.26	0	0	0.03	0	1.26	1.39	0	0.03	2.98	0.8	0	6.74
Colwyn Bay															
Colwyn 1	84.28	67.57	0.31	0.01	0.01	0	0.02	1.43	1.17	2.12	0.03	2.82	1.16	0.35	9.42
Colwyn 2	52.99	29.5	0.01	0	0	0	0	0.57	0.93	0.01	0.04	0.98	0.44	0.19	3.18
Colwyn 3	37.08	36.43	0.01	0	0.01	0	0	0.63	0	0.53	0.03	1.07	0.63	0.07	2.97
Eirias 1	169.54	51.16	0.03	0.39	0.19	0.94	0.17	0.19	0.69	2.65	0.1	3.05	0.66	0.48	9.52
Eirias 2	49.86	47.38	0.05	1.05	0.14	0	0	1.9	0.4	0.92	0.05	1.88	0.68	0.13	7.21
Glyn 1	15.74	15.74	0	0	0	0	0	0.01	0	0.02	0.07	0.4	0.14	0.02	0.66
Glyn 2	74.69	74.29	0.29	0.37	0	0	0	7.12	0.13	3.17	0.14	0.76	1.5	0.19	13.67
Glyn 3	197.01	35.46	0.53	0.6	0	0	0	1.11	0.21	4.67	0.06	1.45	0.46	0.15	9.25
Llanddulas	509.79	58.37	1.35	0.27	0.01	0.21	0	1.8	1.51	1.67	0.04	2.33	1.9	0.35	11.44
Llandrillo yn Rhos 1	106.32	63.93	1.35	0	0.56	1.11	0	0.78	0.34	0.11	0.03	5.21	0.94	0.25	10.7
Llandrillo yn Rhos 2	45.76	45.7	0.02	0	0.09	0	0	0.19	0.3	0	0.03	4.32	0.68	0.08	5.71
Llandrillo yn Rhos 3	35.05	33.33	0	0	0	0	0	0.51	0.01	0	0.02	1.03	0.14	0.1	1.81
Llandrillo yn Rhos 4	38.14	38.14	0.05	0.31	0	0	0	0.51	0.3	0	0.04	1.18	0.29	0.2	2.86
Llandrillo yn Rhos 5	83.64	65.13	0.11	0.37	0.03	0.39	0.03	0.25	0.59	0.07	0.02	3.72	0.44	0.15	6.18
Llysfaen 1	308.27	48.34	5.17	0.11	0	0.13	0.21	1.03	0.86	0.01	0.06	0.72	0.37	0.26	8.86
Llysfaen 2	258.53	22.93	0.05	0.07	0	0	0.19	0.17	0.69	0.24	0.02	1.03	0.1	0.09	2.63
Mochdre	280.88	53.22	0.88	0.45	0.02	0	0	0.37	0	0	0.09	2.12	1.49	0.38	5.8
Penrhyn 2	38.76	3.46	0	0	0	0	0	0.65	0	0	0	0	0	0	0.65
Penrhyn 3	146.43	32.66	0	0.01	0	0	0	4.66	0	0.01	0	0.03	0.01	0.06	4.77
Rhiw 1	308.22	100.93	0.01	0	0.69	0	0.1	3.2	1.22	15.25	0.01	12.11	3.25	0.52	36.36
Rhiw 2	55.02	54.09	0	0.03	0	0	0	0.23	0.64	13.89	0.02	4.38	0.96	0.12	20.28
Rhiw 3	51.2	50.57	0.03	0.02	0.08	0	0	1.34	0.31	0.41	0.03	1.78	1.29	0.25	5.53
Rhiw 4	77.47	70.74	0.65	0.03	0.99	0	0	3.44	0.23	1.32	0.01	7.62	2.19	0.61	17.1
Conwy															
Conwy 1	354.44	105.21	2.4	0.09	0	0	0	0.3	18.46	0.14	0.11	1.6	5.51	0.01	28.62

Ward (LSOA) with WIMD (Cluster Area Ward highlighted)	Total Ward Area (ha)	Town Area in ward (ha)	COM (ha)	EDU (ha)	HOS (ha)	BUR (ha)	FLD (ha)	OSF (ha)	OSI (ha)	WOD (ha)	RHD (ha)	RLD (ha)	TRN (ha)	UNC (ha)	Total Cover TCWTC 3 (ha)
Conwy 2	88.78	62.99	0.87	0.18	0.01	0.43	0	0.95	5.16	0	0.09	3.23	1.41	0.03	12.36
Conwy 3	170.77	34.13	0.16	0.02	0	0	0	0.04	1.52	0	0.04	2.08	0.36	0	4.23
Llandudno															
Craig-y-Don 1	33.91	26.68	0	0	0	0	0	0.09	0	0	0.05	0.78	0.26	0	1.18
Craig-y-Don 2	253.58	45.56	0	0	0.08	0	0	0.73	3.45	0.08	0.25	2.6	0.81	0	8
Gogarth 1	121.93	54.67	0.25	0.09	0.15	0	0	0.78	5.21	0.04	0.09	2.24	0.48	0.01	9.34
Gogarth 2	409.78	44.49	0	0	0	0	0	0.4	1.85	0	0.07	0.93	0.33	0.01	3.59
Mostyn 1	76.5	31.05	0.1	0	0	0	0	0.07	0.07	0	0.05	0.18	0.14	0	0.59
Mostyn 2	47.46	46.16	0.04	0.02	0	0	0	0.12	0	0	0.04	0.49	0.67	0	1.39
Tudno 1	57.24	54.61	0.86	0	0	0	0	0.03	0	0	0.23	0.41	0.56	0.01	2.1
Tudno 2	94.62	49.06	0.55	0.03	0	0	0	0.03	0	0	0.11	0.41	0.14	0.01	1.28
Tudno 3	62.73	39.84	0	0.05	0	0	0	0.07	0.45	0	0.02	2.07	0.24	0	2.9
Llanfairfechan															
Bryn	972.15	98.06	1	0.52	6.06	0.15	0	1.49	9.06	0.01	0.21	4.85	2.23	0.06	25.64
Pandy	819.99	54.39	0.29	0	0.07	0									
Llanrwst															
Crwst	398.16	78.39	1.25	0	0.02	0.08	0	2.72	0.83	0	0.13	2.07	1.22	0.07	8.4
Gower	126.26	33.5	1.2	0	0	0.1	0	0.02	0.66	0	0.12	1.8	1.05	0.04	4.98
Llansantffraid															
Llansanffraid 1	198.99	35.28	0.24	0.11	0	0.08	0	0.14	1.34	0	0.06	3.04	1	0.02	6.03
Llansanffraid 2	1546.39	18.7	0.01	0	0	0	0	0.06	0.14	0	0.02	1.78	0.41	0.01	2.42
Penmaenmawr															
Pant-yr-afon/Penmaenan 1	777.08	45.01	0.11	0.22	0	0	0	0.86	0.69	0	0.22	6.93	1.69	0.12	10.84
Pant-yr-afon/Penmaenan 2	238.72	45.47	0.73	0	0	0	0	0.36	5.55	0.04	0.14	0.96	1.95	0.03	9.75
Penrhyn Bay															
Craig-y-Don 2	253.58	29.26	0.27	0	0	0	0	0	5.3	0	0	1.78	0.45	0.01	7.81
Penrhyn 1	588.44	35.37	0.08	0.08	0.04	0	0	0.01	2.79	0	0.04	1	0.39	0.01	4.45
Penrhyn 2	38.76	35.3	0.03	0	0	0	0	0.05	0.26	0	0.05	1.2	0.2	0	1.78
Penrhyn 3	146.43	68.28	0.03	0.01	0	0	0	0.28	3.26	0	0.02	1.58	0.43	0	5.62
Towyn / Kinmel Bay															
Abergele Pensarn	234.59	26.85	0.12	0	0	0	0	0	0.01	0	0.01	0.54	0.03	0	0.71
Kinmel Bay 1	78.42	62.29	0.29	0	0.02	0	0	0.02	0.15	0	0	0.66	0.19	0.01	1.33
Kinmel Bay 2	238.68	111.86	1.96	0	0	0	0	0.08	4.39	0	0.01	4.39	0.53	0.04	11.41
Kinmel Bay 3	91.73	91.59	0.7	2.5	0	0	0	0.08	2.67	0	0.03	1.38	0.24	0.03	7.62
Kinmel Bay 4	58.85	39.9	0.04	0	0	0	0	0.01	0.56	0	0.02	1.06	0.11	0	1.8
Towyn	566.99	179.58	2.7	0	0.04	0.03	0	2.4	0.87	0	0.03	2.95	0.62	0.03	9.66
Tywyn / Deganwy / Llandudno Junction															
Deganwy 1	171.27	58.92	0	0	0	0	0	0	0.27	0	0.03	4.29	0.38	0	4.97
Deganwy 2	97.65	56.41	1.3	0	0	0	0	0.29	0.03	0	0.06	4.62	0.58	0.01	6.91
Llansanffraid 2	1546.39	14.21	1.59	0	0	0	0	0	0.52	0	0	0.01	0.88	0.56	3.57
Marl 1	82.95	63.98	0.04	0	0	0	0	0.74	0.31	0	0.04	5.09	0.89	0	7.1

Ward (LSOA) with WIMD (Cluster Area Ward highlighted)	Total Ward Area (ha)	Town Area in ward (ha)	COM (ha)	EDU (ha)	HOS (ha)	BUR (ha)	FLD (ha)	OSF (ha)	OSI (ha)	WOD (ha)	RHD (ha)	RLD (ha)	TRN (ha)	UNC (ha)	Total Cover TCWTC 3 (ha)
Marl 2	161.68	62.93	1.97	0.05	0.15	0	0	1.02	0.75	0	0.08	1.63	1.22	0.01	6.89
Pensarn 1	68.97	51.96	3.62	0	0.02	0	0	0.05	0.01	0	0.03	0.79	1.6	0.01	6.14
Pensarn 2	216.37	43.82	2.37	0	0	0	0	0.02	0.44	0	0.03	0.91	0.85	0.04	4.67

Table 3: Land-use distribution of canopy cover within wards (LSOAs)

Wynnstay Road, Old Colwyn

3.2 Balance between urban woodland and amenity trees

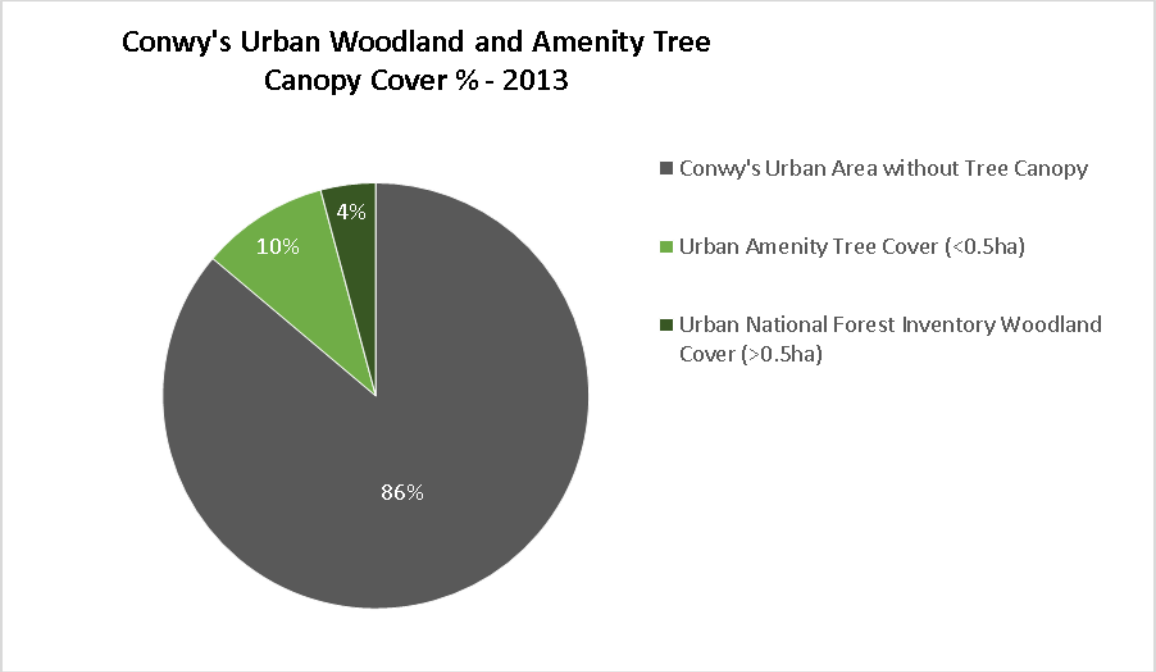


Figure 6: Conwy's Urban Woodland and Amenity Tree Canopy Cover % - 2013

Ysbyty Bryn-y-Neuadd, Llanfairfechan

Spatial distribution of woodland and amenity trees within towns

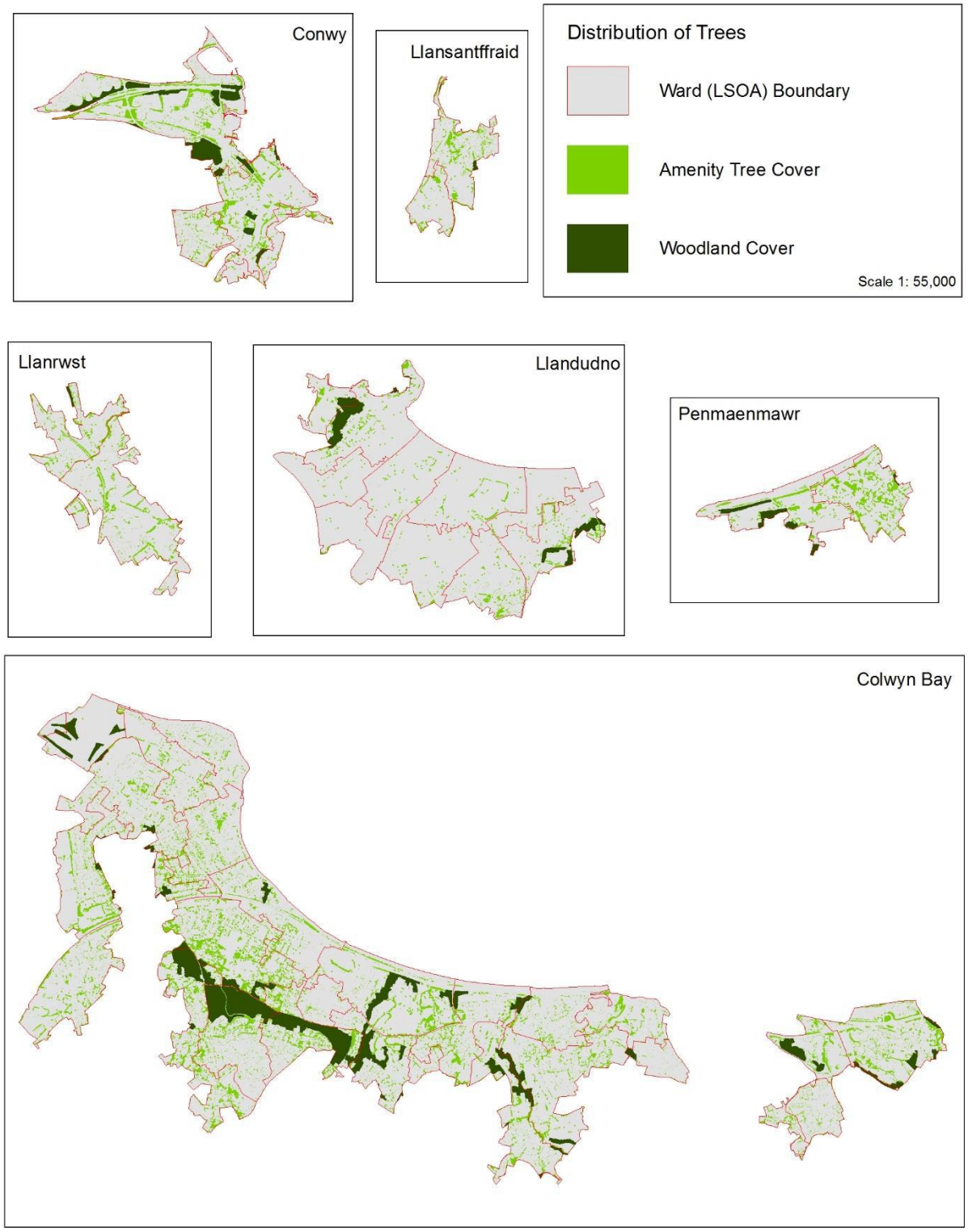


Figure 7: Spatial Distribution of Woodland and Amenity Trees within Towns

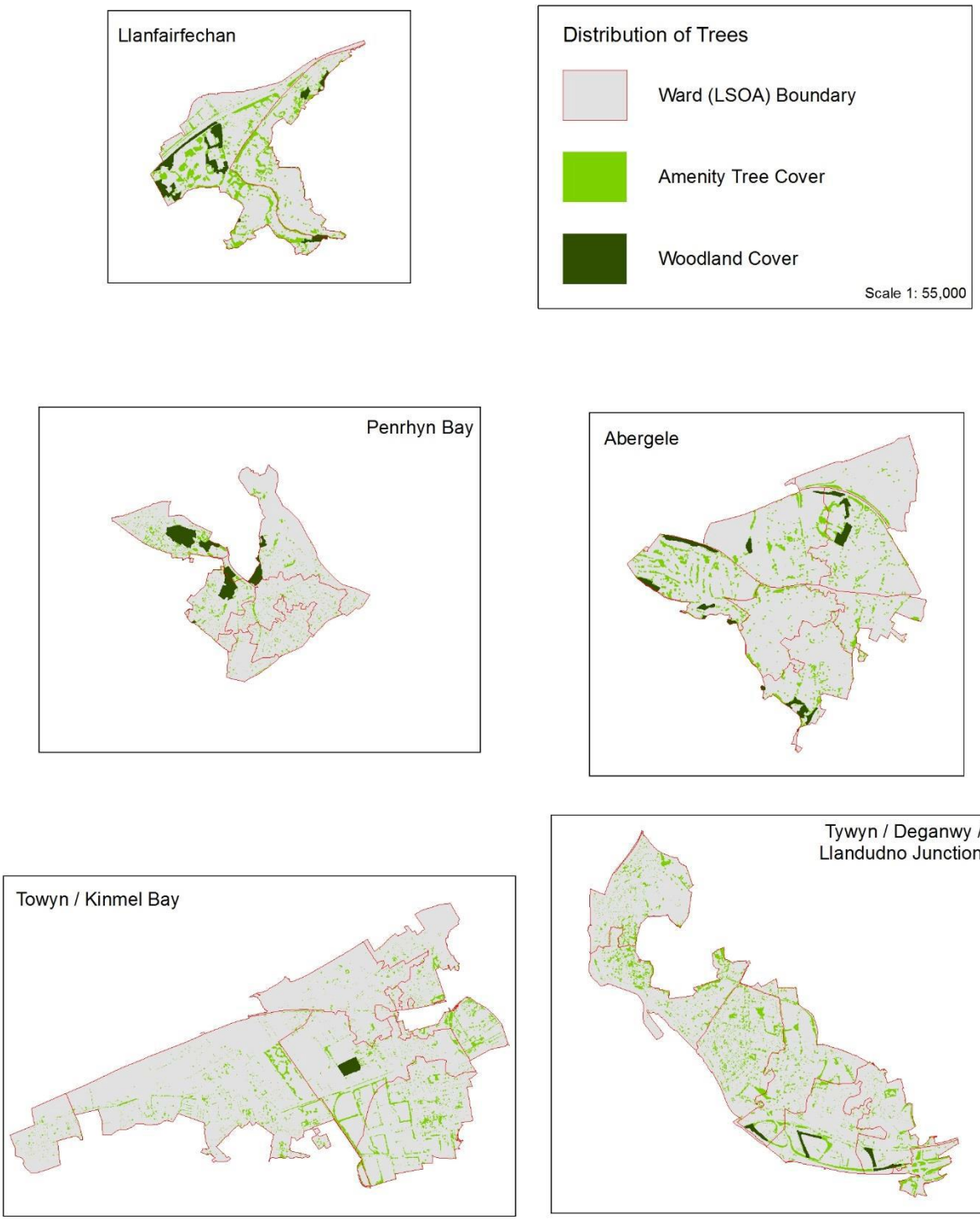


Figure 8: Spatial Distribution of Woodland and Amenity Trees within Towns

Extent of woodland and amenity tree coverage across Conwy's towns

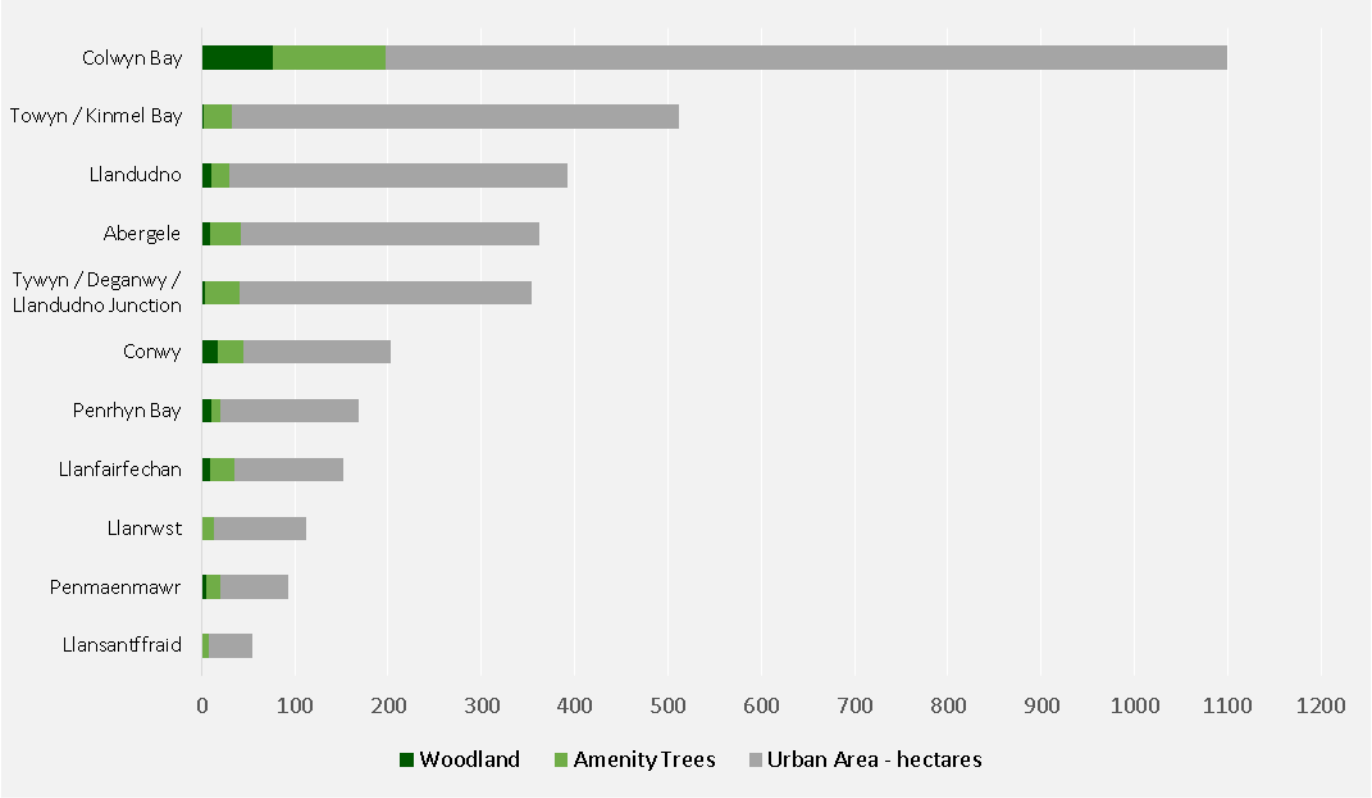


Figure 9: Extent of Woodland and Amenity Tree Coverage (ha) across Conwy County Borough's Towns

Land-use distribution of woodland vs. amenity canopy

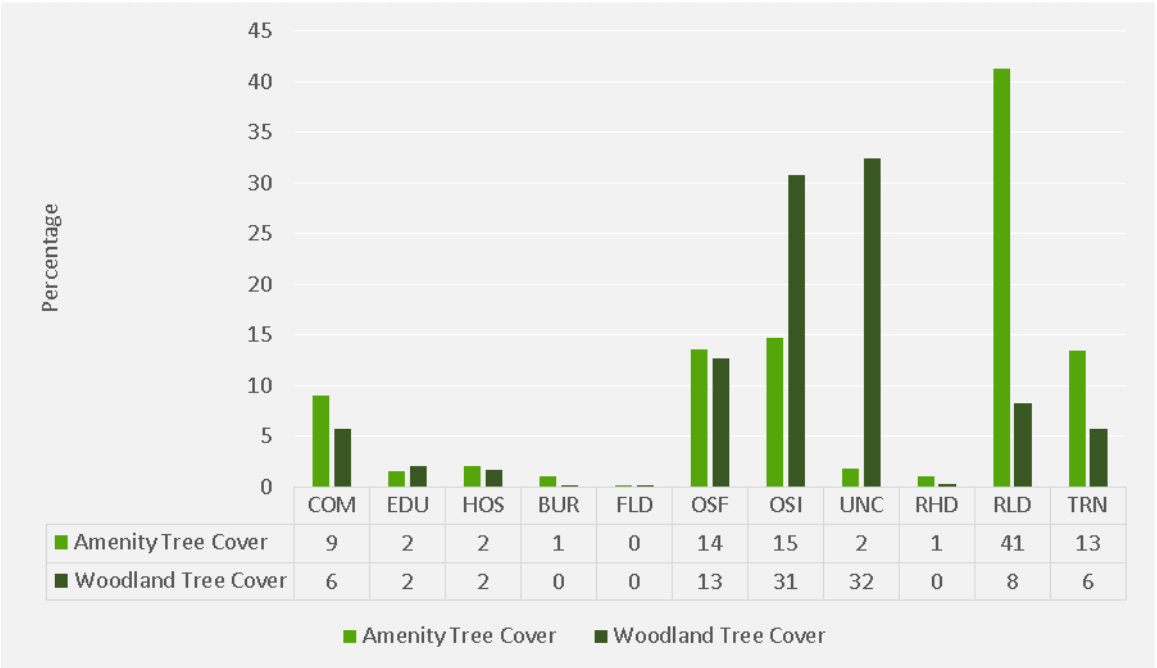


Figure 10: Percentage Distribution of Amenity Tree and Woodland Cover across the Land-Uses

Wards with high and low woodland (NFI) cover – making the distinction between 'wooded' and 'amenity' tree cover

Cluster Area Wards (LSOA)	Urban Area	'Wooded' %	'Amenity' Tree %	Total Canopy %
High 'Wooded' Wards				
Glyn 3	Colwyn Bay	66%	34%	26.1%
Llysfaen 1	Colwyn Bay	45%	55%	18.3%
Glyn 2	Colwyn Bay	44%	56%	18.4%
Low 'Wooded' Wards				
Mostyn 1	Llandudno	0%	100%	1.9%
Kinmel Bay 1	Towyn / Kinmel Bay	0%	100%	2.1%
Tudno 2	Llandudno	0%	100%	2.6%
Mostyn 2	Llandudno	0%	100%	3.0%
Tudno 1	Llandudno	0%	100%	3.8%
Abergele Pensarn	Abergele	0%	100%	4.0%

Table 4: The highest and lowest 'woodland' cover within Conwy County Borough's Communities First Cluster Area wards (LSOAs)

3.3 Monitoring the extent of urban tree canopy over time - losses and gains

Town	Amenity Tree Loss & Gain between 2006, 2009 & 2013 - Large Trees 12m+ 2006 - 2009	Amenity Tree Loss & Gain between 2006, 2009 & 2013 - Large Trees 12m+ 2009 - 2013	Amenity Tree Loss & Gain between 2006, 2009 & 2013 - Medium Trees 6 - 12m 2006 - 2009	Amenity Tree Loss & Gain between 2006, 2009 & 2013 - Medium Trees 6 – 12m 2009 - 2013	Amenity Tree Loss & Gain between 2006, 2009 & 2013 - Small Trees 3 - 6m 2006 - 2009	Amenity Tree Loss & Gain between 2006, 2009 & 2013 - Small Trees 3 - 6m 2009 - 2013	Change in Tree Count 2006 - 2009	Change in Tree Count 2009 - 2013	Change in Tree Count 2006 - 2013
Colwyn Bay	371	**-66**	**-5217**	**-953**	9377	**-4262**	4531	**-5281**	**-750**
Towyn / Kinmel Bay	**-32**	3	2285	**-707**	**-3302**	**-522**	**-1049**	**-1226**	**-2275**
Llandudno	**-10**	**-5**	**-222**	-7	2747	**-1714**	2515	**-1726**	789
Abergele	283	**-25**	1603	**-281**	**-8408**	**-327**	**-6522**	**-633**	**-7155**
Tywyn / Deganwy / Llandudno Junction	**-79**	9	2940	**-954**	**-7756**	1860	**-4895**	915	**-3980**
Penrhyn Bay	5	1	640	**-98**	**-827**	**-110**	**-182**	**-207**	**-389**
Conwy	36	**-2**	129	**-395**	2021	469	2186	72	2258
Llanfairfechan	**-244**	1	93	385	**-16**	1660	**-167**	2046	1879
Llanrwst	**-38**	12	649	193	**-2632**	239	**-2021**	444	**-1577**
Penmaenmawr	**-15**	2	**-571**	69	2198	916	1612	987	2599
Llansantffraid	**-15**	**-1**	**-119**	**-13**	**-96**	247	**-230**	233	3
Change in Tree Numbers	262	**-71**	2210	**-2761**	**-6694**	**-1544**	**-4222**	**-4376**	**-8598**

Table 5: Town amenity tree loss and gain between 2006, 2009 & 2013

Town	Area of NFI 2011 (ha)	Area of NFI 2014 (ha)	Change (ha)
Abergele	9.87	9.97	+0.09
Colwyn Bay	74.47	76.54	+2.07
Conwy	17.18	17.18	0.00
Llandudno	11.29	11.29	0.00
Llanfairfechan	9.52	9.83	+0.31
Llanrwst	0.48	0.48	0.00
Llansantffraid	0.40	0.40	0.00
Penmaenmawr	4.83	4.83	0.00
Penrhyn Bay	10.04	10.04	0.00
Towyn / Kinmel Bay	1.68	2.26	+0.58
Tywyn / Deganwy / Llandudno Junction	3.35	3.35	0.00
Conwy County Borough	**143.1**	**146.2**	**+3.06**

Table 6: Town woodland loss and gain between 2011 and 2014

URBAN NAME	Area Size Rank	Survey Year	Urban Area (ha)	Woodland (ha)	Amenity Trees (ha)	Woodland %	Amenity Trees %	Woodland + Amenity Trees (ha)	Total Cover %
Abergele	55	2006	362.5	9.9	33.8	2.70%	9.30%	43.7	12.10%
		2009	362.5	9.9	35.6	2.70%	9.80%	45.5	12.60%
		2013	362.5	10	32.2	2.70%	8.90%	42.2	11.60%
Colwyn Bay	17	2006	1099.9	74.5	146.9	6.80%	13.40%	221.4	20.10%
		2009	1099.9	74.5	136.6	6.80%	12.40%	211	19.20%
		2013	1099.9	76.5	120.2	7.00%	10.90%	196.8	17.90%
Conwy	91	2006	203.3	17.2	26.6	8.50%	13.10%	43.8	21.50%
		2009	203.3	17.2	31.2	8.50%	15.40%	48.4	23.80%
		2013	203.3	17.3	27.9	8.50%	13.70%	45.2	22.20%
Llandudno	53	2006	392.2	11.3	19.5	2.90%	5.00%	30.8	7.90%
		2009	392.2	11.3	22.3	2.90%	5.70%	33.6	8.60%
		2013	392.2	11.3	19.1	2.90%	4.90%	30.4	7.70%
Llanfairfechan	109	2006	152.5	9.5	25.1	6.20%	16.50%	34.7	22.70%
		2009	152.5	9.5	21.7	6.20%	14.20%	31.2	20.50%
		2013	152.5	9.9	26.1	6.50%	17.10%	36.1	23.70%
Llanrwst	140	2006	112.1	0.5	11.6	0.40%	10.40%	12.1	10.80%
		2009	112.1	0.5	11.2	0.40%	10.00%	11.7	10.40%
		2013	112.1	0.4	12.6	0.40%	11.20%	13	11.60%
Llansantffraid	200	2006	54	0.4	8.8	0.70%	16.40%	9.2	17.10%
		2009	54	0.4	7.8	0.70%	14.40%	8.2	15.20%
		2013	54	0.3	7.7	0.60%	14.20%	8	14.80%
Penmaenmawr	158	2006	92.8	4.8	14.5	5.20%	15.60%	19.3	20.80%
		2009	92.8	4.8	14.2	5.20%	15.30%	19.1	20.50%
		2013	92.8	5	16	5.30%	17.30%	21	22.60%
Penrhyn Bay	98	2006	168.4	10	7.8	6.00%	4.60%	17.8	10.60%
		2009	168.4	10	10.6	6.00%	6.30%	20.7	12.30%
		2013	168.4	10.2	9.8	6.00%	5.80%	20	11.90%
Towyn / Kinmel Bay	38	2006	512.4	1.7	26.8	0.30%	5.20%	28.5	5.60%
		2009	512.4	1.7	35.6	0.30%	7.00%	37.3	7.30%
		2013	512.4	2.3	30.3	0.40%	5.90%	32.5	6.40%
Tywyn / Deganwy / Llandudno Junction	56	2006	353.5	3.3	35.3	0.90%	10.00%	38.6	10.90%
CONWY TOTAL		2006	3503.3	143.1	356.8	4.10%	10.20%	499.9	14.30%
		2009	3503.3	143.1	367.2	4.10%	10.50%	510.3	14.60%
		2013	3503.3	146.2	338.9	4.20%	9.70%	485.1	13.80%

Table 7: Summary breakdown of town amenity tree and woodland cover in 2006, 2009 and 2013

Llanfairfechan: © Crown Copyright: RCAHMW

3.5 Summary: actionable findings

Identifying landowners to promote better care and planting of trees

The distribution of Conwy's urban tree resource amongst 12 land uses has demonstrated the wide range of public and private stakeholders that have a decisive impact on the county's existing and future urban canopy cover. The strategic delivery of increasing canopy cover will be greatly facilitated if existing funding streams of respective landowners' budgets can be tapped into in order to support the delivery of a high quality environment and infrastructure across urban Conwy. In doing so, this would recognise the huge contribution that trees make to ecosystem services.

Identifying quantity and quality of tree cover to improve the provision and management of trees where best aligned to communities needs

The case for distinguishing between woodland and amenity canopy cover is useful where:

- Quantity; where woodland cover increases a town's canopy but, in terms of benefits to neighbourhoods, they are often not realising their potential due to lack of management or accessibility.
- Quality; where regular tree management in parks, gardens and streets provide a cared-for appearance. These are the trees that, whilst not extensive in terms of canopy, tend to be 'on the doorstep' of where people live and work.

The presence, or not, of woodland is clearly a factor in accounting for the highs and lows of the South Wales Valley and coastal towns, such as in Conwy. The open-space land-use categories host the majority of woodland cover, with private gardens being the major provider of towns' amenity trees. Examining woodland vs. amenity cover at a ward level helps to understand that the make-up of the local landscape plays a major role in determining high and low cover. Despite the broad high and low cover distinctions between the Valleys and coasts, affluent versus deprived areas, there are numerous specific examples where woodland significantly raises canopy levels in both localities.

Further detailed analysis and ground-truthing would usefully reveal:

- Evidence as to the exact spatial balance between 'wooded' and 'amenity tree' areas within communities.
- To what degree quantity and quality of tree cover align with the needs of where people live, work and play and where targeted tree planting is required.

Identifying amenity tree and woodland loss, aligning with decline in canopy cover and highlighting specific town and county concerns for further investigation

The loss of large long-lived trees is concerning. This maturing Victorian and Edwardian legacy, whilst at some point in need of replacement, does offer urban society the greatest benefits. The danger is that these trees are not being replaced and where they are, small, short-lived trees offering fewer overall benefits take their place. A consistent, resourced and planned approach is needed to:

- Protect and care for the Victorian and Edwardian legacy of large trees
- Promote planting of large canopy specimens.

Initial analysis combining tree count and canopy cover loss across counties highlights specific towns where a diminishing tree resource is apparent. The next steps for local authorities and NRW would be to:

- Undertake detailed interrogation of the survey data, ascertaining both the validity of the highlighted concerns and identifying in detail where specific loss is occurring.
- Undertake complimentary ground-truthing across towns to further understand and explain the reasons behind tree removal and their rate of loss.

Identifying legislation to protect and funding to increase tree planting opportunities

Optimising some of the existing legislation to reduce tree loss and current funding tools to secure planting schemes can both facilitate in addressing canopy cover concerns. Examples of practical next steps include:

- Reviewing the effectiveness and use of existing tools and legislation for tree preservation.
- Ensuring investments in enhancing the Wales urban treescape are an eligible expenditure for grant programmes such as Vibrant and Viable Places, Coastal Communities Fund, Business Improvement District Fund Wales, Regional Transport Consortia Grant, Safe Routes in Communities.

Colwyn Bay:

4. Neighbourhood canopy cover – a focus on wards

This section focuses on contrasting ward level canopy cover, considering levels of deprivation where relevant, to identify where qualitative or quantitative improvements to tree cover might be needed.
Analysis and findings are presented as follows:

4.1 Best and worst canopied urban wards

Town ward by ward canopy cover breakdown

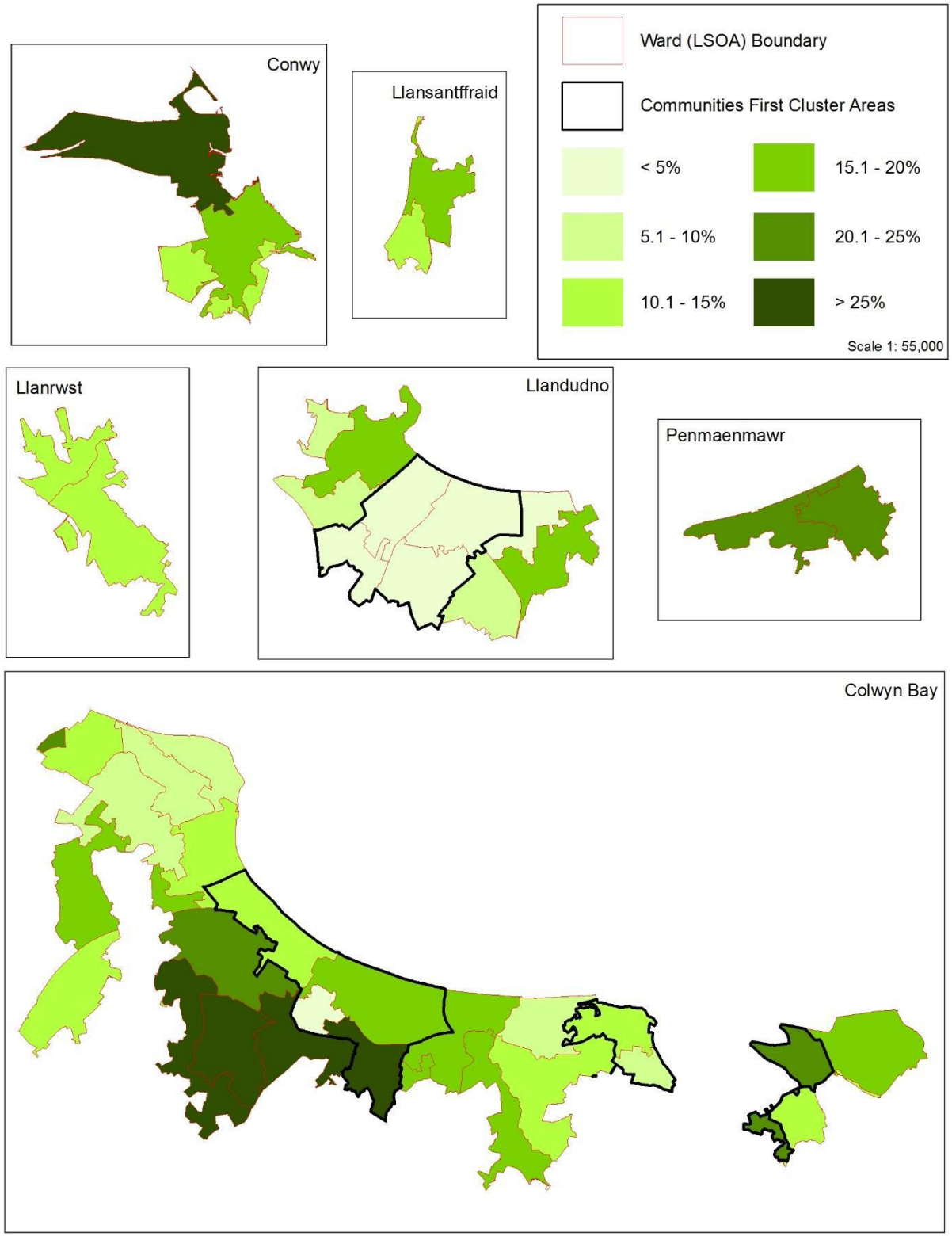


Figure 11: Town Ward by Ward Canopy Cover Breakdown

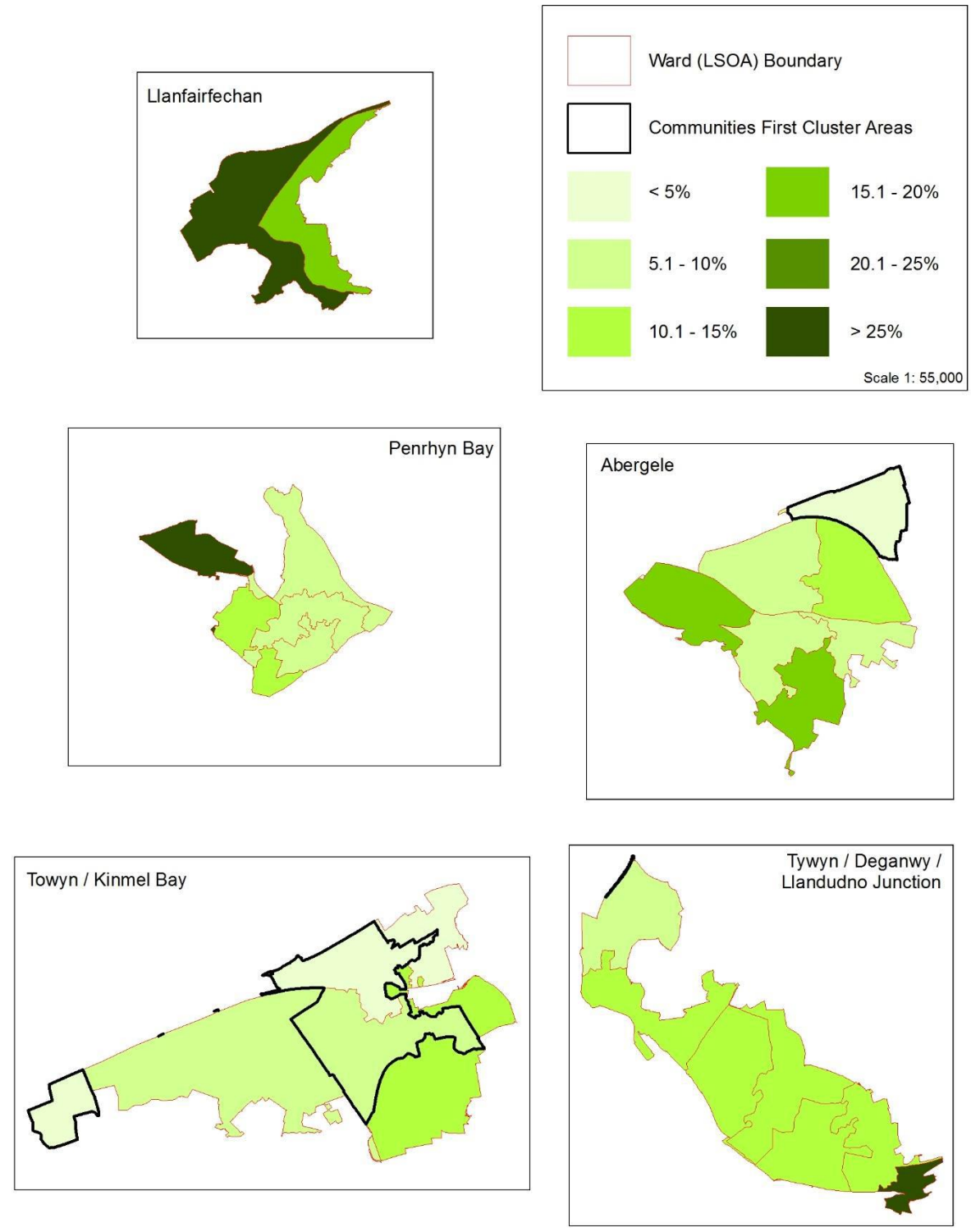


Figure 12: Town Ward by Ward Canopy Cover Breakdown

4.2 Multiple deprivation and tree canopy cover

Wales' Index of Multiple Deprivation (WIMD)

No	Key		WIMD Category	Total No. of Wards	TCWTC Urban Area (ha)
1	Most Deprived	0-10%	1 - 190	2	123
2		10-20%	191 - 380	9	613
3		20-30%	381 - 570	6	252
4		30-50%	571 - 950	15	788
5	Least Deprived	50-100%	951 - 1896	30	1726
	Total			62	3502

Table 8: Distribution of Conwy County Borough's wards (LSOAs) as per the Welsh Index of Multiple Deprivation 2011

'Top 10' most canopied and 'Bottom 10' least canopied urban wards and WIMD

Canopy Rank	Urban Area	Ward / WIMD Category	Urban Area in Ward (ha)	Canopy Cover
1	Colwyn Bay	Rhiw 2	54 of 55	37.6%
2	Colwyn Bay	Rhiw 1	101 of 308	36.0%
3	Conwy	Conwy 1	105 of 354	27.3%
4	Penrhyn Bay	Craig-y-Don 2	29 of 254	26.9%
5	Colwyn Bay	Glyn (Conwy) 3	35 of 197	26.4%
6	Llanfairfechan	Bryn	98 of 972	26.2%
7	Twyn / Deganwy / Llandudno Junction	Llansanffraid 2	14 of 1546	25.5%
8	Penmaenmawr	Pant-yr-afon/Penmaenman 1	45 of 777	24.1%
9	Colwyn Bay	Rhiw 4	71 of 77	24.1%
10	Colwyn Bay	Llysfaen 1	33 of 308	23.8%

Table 9: 'Top10' most canopied wards

Canopy Rank	Urban Area	Ward / WIMD Category	Urban Area in Ward (ha)	Canopy Cover
1	Llandudno	Mostyn 1	31 of 77	1.9%
2	Towyn / Kinmel Bay	Kinmel Bay 1	62 of 78	2.2%
3	Llandudno	Tudno 2	49 of 95	2.6%
4	Towyn / Kinmel Bay	Abergele Pensarn	27 of 235	2.6%
5	Llandudno	Mostyn 2	46 of 47	3.0%
6	Llandudno	Tudno 1	55 of 57	3.8%
7	Colwyn Bay	Glyn 1	16 of 16	4.1%
8	Llandudno	Craig-y-Don 1	27 of 34	4.4%
9	Towyn / Kinmel Bay	Kinmel Bay 4	40 of 59	4.5%
10	Abergele	Abergele Pensarn	47 of 235	4.8%

Table 10: 'Bottom 10' least canopied wards

Canopy Cover in Communities First Cluster Areas

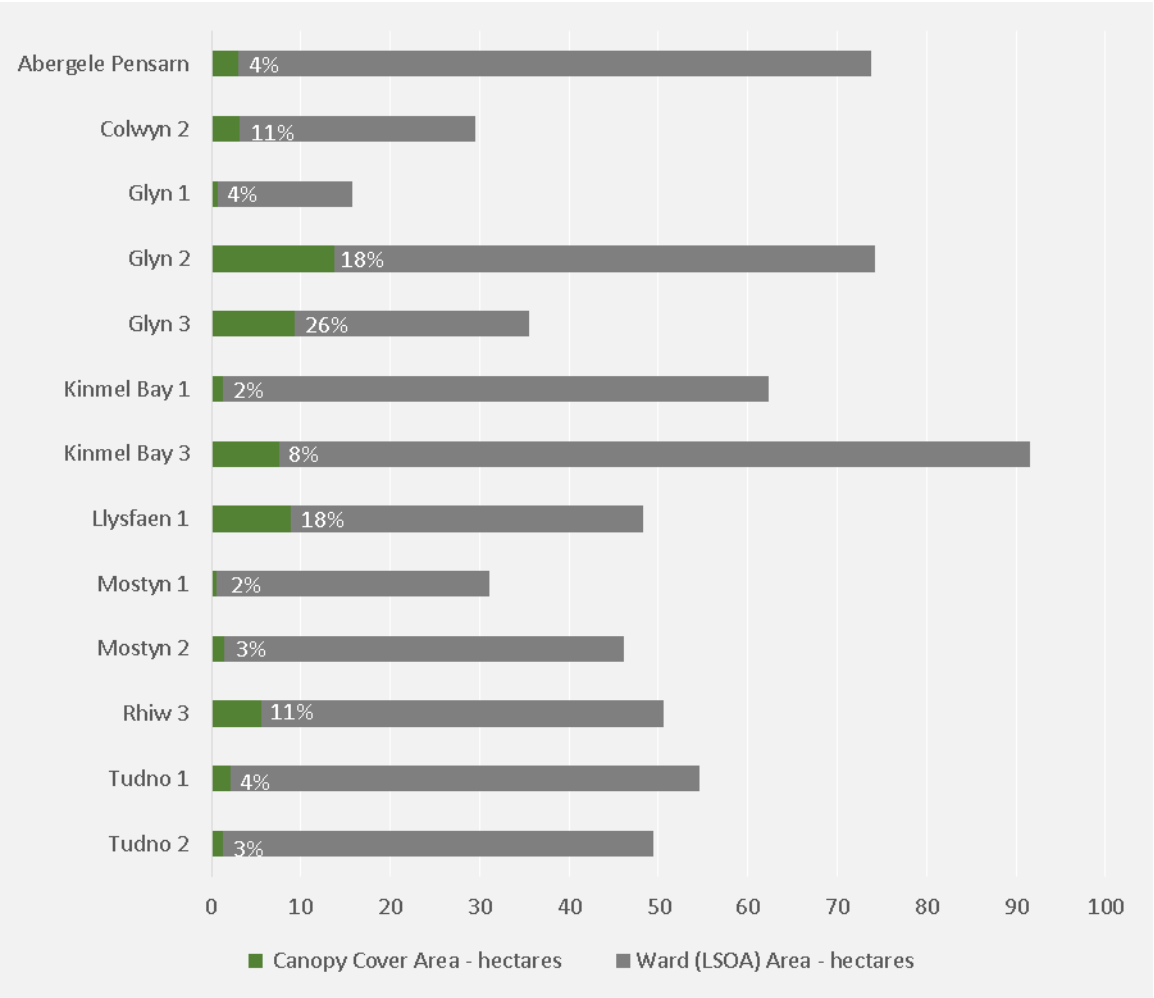
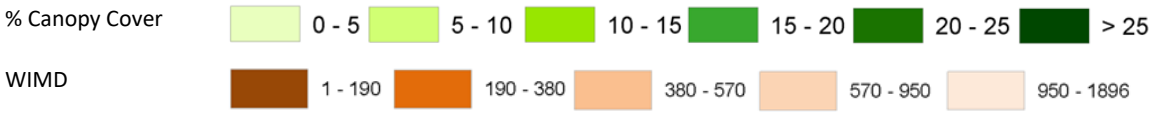


Figure 13: Canopy Cover in 'Conwy' Communities First Cluster Area

Colwyn Bay: © Crown Copyright: RCAHMW

Ward by Ward (LSOAs) Canopy Cover



Ward (LSOA) with WIMD (Cluster Area Ward highlighted)	Total Ward Area (ha)	Town Area in ward (ha)	Amenity Trees 2006 (ha)	NFI Cover 2011 (ha)	Total Cover TCWTC 1 (ha)	Total % Cover TCWTC1	Amenity Trees 2009 (ha)	NFI Cover 2011 (ha)	Total Cover TCWTC 2 (ha)	Total % Cover TCWTC2	Amenity Trees 2013 (ha)	NFI Cover 2014 (ha)	Total Cover TCWTC 3 (ha)	Total % Cover TCWTC3
Abergele														
Abergele Pensarn	234.59	46.9	2.57	0	2.57	5.50%	2.43	0	2.43	5.20%	2.25	0	2.25	4.80%
Gele 1	951.92	29.37	2.66	0	2.66	9.00%	2.95	0	2.95	10.10%	2.78	0	2.78	9.60%
Gele 2	47.41	47.36	3.56	0	3.56	7.50%	3.58	0	3.58	7.60%	3.27	0	3.27	7.00%
Gele 3	274.63	106.59	13.6	5.92	19.51	18.30%	14.39	5.92	20.31	19.10%	12.9	5.92	18.82	17.60%
Pentre Mawr 1	63.48	60.83	5.13	2.86	8	13.10%	6.08	2.86	8.94	14.70%	4.96	3.13	8.1	13.30%
Pentre Mawr 2	102.29	70.94	6.28	0.98	7.26	10.20%	6.12	0.98	7.1	10.00%	5.94	0.8	6.74	9.50%
Colwyn Bay														
Colwyn 1	84.28	67.57	7.4	3.17	10.57	15.60%	6.59	3.17	9.75	14.40%	6.25	3.17	9.42	13.80%
Colwyn 2	52.99	29.5	3.88	0.01	3.89	13.20%	3.2	0.01	3.21	10.90%	3.16	0.02	3.18	11.00%
Colwyn 3	37.08	36.43	4.24	0.66	4.9	13.40%	2.34	0.66	3	8.20%	2.32	0.66	2.97	8.30%
Eirias 1	169.54	51.16	6.08	4.26	10.34	20.20%	5.95	4.26	10.21	20.00%	5.26	4.26	9.52	18.70%
Eirias 2	49.86	47.38	6.84	2	8.84	18.70%	5.6	2	7.6	16.00%	5.21	2	7.21	15.30%
Glyn 1	15.74	15.74	0.81	0.02	0.82	5.20%	0.75	0.02	0.77	4.90%	0.64	0.02	0.66	4.10%
Glyn 2	74.69	74.29	8.57	5.96	14.52	19.50%	8.54	5.96	14.5	19.50%	7.71	5.96	13.67	18.40%
Glyn 3	197.01	35.46	3.36	6.15	9.51	26.80%	3.67	6.15	9.82	27.70%	3.1	6.15	9.25	26.40%
Llanddulas	509.79	58.37	14.79	2.7	17.5	30.00%	9.96	2.7	12.66	21.70%	8.74	2.7	11.44	19.70%
Llandrillo yn Rhos 1	106.32	63.93	9.28	1.53	10.81	16.90%	10.97	1.53	12.5	19.60%	9.16	1.53	10.7	16.70%
Llandrillo yn Rhos 2	45.76	45.7	6.27	0	6.27	13.70%	6.17	0	6.17	13.50%	5.71	0	5.71	12.40%
Llandrillo yn Rhos 3	35.05	33.33	2.3	0	2.3	6.90%	2.05	0	2.05	6.20%	1.81	0	1.81	5.50%
Llandrillo yn Rhos 4	38.14	38.14	3.19	0	3.19	8.40%	3.28	0	3.28	8.60%	2.86	0	2.86	7.50%
Llandrillo yn Rhos 5	83.64	65.13	5.62	0.92	6.53	10.00%	6.81	0.92	7.73	11.90%	5.17	1.01	6.18	9.50%
Llysfaen 1	308.27	48.34	10.37	3.32	13.69	28.30%	5.85	3.32	9.17	19.00%	4.88	3.99	8.86	18.30%
Llysfaen 2	258.53	22.93	1.87	0.96	2.83	12.40%	1.89	0.96	2.85	12.40%	1.67	0.96	2.63	11.40%
Mochdre	280.88	53.22	5.43	0	5.43	10.20%	7.05	0	7.05	13.20%	5.79	0	5.8	10.90%
Penrhyn 2	38.76	3.46	0.04	0.3	0.34	9.80%	0.04	0.3	0.34	9.80%	0.04	0.61	0.65	21.80%
Penrhyn 3	146.43	32.66	0.25	3.57	3.82	11.70%	0.33	3.57	3.9	11.90%	0.22	4.55	4.77	14.40%
Rhiw 1	308.22	100.93	19.7	19.9	39.59	39.20%	19.26	19.9	39.16	38.80%	16.46	19.9	36.36	36.00%
Rhiw 2	55.02	54.09	5.95	15.18	21.12	39.10%	5.7	15.18	20.88	38.60%	5.1	15.18	20.28	37.60%
Rhiw 3	51.2	50.57	5.31	0.94	6.25	12.40%	5.17	0.94	6.11	12.10%	4.59	0.94	5.53	10.80%

Ward (LSOA) with WIMD (Cluster Area Ward highlighted)	Total Ward Area (ha)	Town Area in ward (ha)	Amenity Trees 2006 (ha)	NFI Cover 2011 (ha)	Total Cover TCWTC 1 (ha)	Total % Cover TCWTC1	Amenity Trees 2009 (ha)	NFI Cover 2011 (ha)	Total Cover TCWTC 2 (ha)	Total % Cover TCWTC2	Amenity Trees 2013 (ha)	NFI Cover 2014 (ha)	Total Cover TCWTC 3 (ha)	Total % Cover TCWTC3
Rhiw 4	77.47	70.74	15.06	2.88	17.94	25.40%	15.24	2.88	18.12	25.60%	14.22	2.88	17.1	24.10%
Conwy														
Conwy 1	354.44	105.21	13.26	14.39	27.65	26.30%	14.74	14.39	29.13	27.70%	14.23	14.39	28.62	27.30%
Conwy 2	88.78	62.99	9.67	2.46	12.13	19.30%	11.56	2.46	14.02	22.20%	9.9	2.46	12.36	19.60%
Conwy 3	170.77	34.13	3.61	0.33	3.94	11.50%	4.84	0.33	5.17	15.20%	3.89	0.33	4.23	12.40%
Llandudno														
Craig-y-Don 1	33.91	26.68	1.11	0	1.11	4.20%	1.12	0	1.12	4.20%	1.18	0	1.18	4.40%
Craig-y-Don 2	253.58	45.56	3.85	4.08	7.93	17.40%	4.27	4.08	8.35	18.30%	3.92	4.08	8	17.40%
Gogarth 1	121.93	54.67	3.65	5.69	9.34	17.10%	4.22	5.69	9.91	18.10%	3.65	5.69	9.34	17.00%
Gogarth 2	409.78	44.49	2.16	1.52	3.67	8.30%	2.16	1.52	3.68	8.30%	2.08	1.52	3.59	8.20%
Mostyn 1	76.5	31.05	0.53	0	0.53	1.70%	0.74	0	0.74	2.40%	0.59	0	0.59	1.90%
Mostyn 2	47.46	46.16	1.45	0	1.45	3.10%	1.64	0	1.64	3.50%	1.39	0	1.39	3.00%
Tudno 1	57.24	54.61	1.57	0	1.57	2.90%	2.17	0	2.17	4.00%	2.1	0	2.1	3.80%
Tudno 2	94.62	49.06	1.34	0	1.34	2.70%	1.34	0	1.34	2.70%	1.28	0	1.28	2.60%
Tudno 3	62.73	39.84	3.84	0	3.84	9.60%	4.61	0	4.61	11.60%	2.9	0	2.9	7.20%
Llanfairfechan														
Bryn	972.15	98.06	15.9	8.14	24.04	24.50%	14.81	8.14	22.95	23.40%	17.19	8.45	25.64	26.20%
Pandy	819.99	54.39	9.21	1.38	10.58	19.50%	6.86	1.38	8.24	15.10%	8.63	1.38	10	18.50%
Llanrwst														
Crwst	398.16	78.39	7.7	0.02	7.72	9.90%	7.52	0.02	7.54	9.60%	8.37	0.02	8.4	10.80%
Gower	126.26	33.5	3.91	0.45	4.36	13.00%	3.65	0.45	4.1	12.20%	4.53	0.45	4.98	14.60%
Llansantffraid														
Llansanffraid 1	198.99	35.28	6.44	0.4	6.84	19.40%	5.44	0.4	5.83	16.50%	5.63	0.4	6.03	17.20%
Llansanffraid 2	1546.39	18.7	2.38	0	2.38	12.70%	2.35	0	2.35	12.50%	2.42	0	2.42	12.80%
Penmaenmawr														
Pant-yr-afon/Penmaenan 1	777.08	45.01	9.73	0.25	9.98	22.20%	9.53	0.25	9.79	21.70%	10.59	0.25	10.84	24.10%
Pant-yr-afon/Penmaenan 2	238.72	45.47	4.76	4.58	9.34	20.50%	4.7	4.58	9.28	20.40%	5.17	4.58	9.75	21.70%
Penrhyn Bay														
Craig-y-Don 2	253.58	29.26	2.48	4.99	7.47	25.50%	3.04	4.99	8.03	27.40%	2.82	4.99	7.81	26.90%
Penrhyn 1	588.44	35.37	1.77	2.29	4.06	11.50%	2.93	2.29	5.22	14.80%	2.16	2.29	4.45	12.70%
Penrhyn 2	38.76	35.3	1.24	0.15	1.39	3.90%	1.61	0.15	1.76	5.00%	1.63	0.15	1.78	5.10%
Penrhyn 3	146.43	68.28	2.37	2.62	4.99	7.30%	3.1	2.62	5.71	8.40%	3	2.62	5.62	8.30%
Towyn / Kinmel Bay														
Abergele Pensarn	234.59	26.85	0.98	0	0.98	3.60%	0.73	0	0.73	2.70%	0.71	0	0.71	2.60%
Kinmel Bay 1	78.42	62.29	1.8	0	1.8	2.90%	2.36	0	2.36	3.80%	1.33	0	1.33	2.10%
Kinmel Bay 2	238.68	111.86	8.76	0	8.76	7.80%	13.38	0	13.38	12.00%	11.41	0	11.41	10.20%
Kinmel Bay 3	91.73	91.59	4.26	1.68	5.94	6.50%	6.28	1.68	7.95	8.70%	5.36	2.26	7.62	8.30%
Kinmel Bay 4	58.85	39.9	1.68	0	1.68	4.20%	2.18	0	2.18	5.50%	1.8	0	1.8	4.50%
Towyn	566.99	179.58	9.35	0	9.35	5.20%	10.69	0	10.69	6.00%	9.66	0	9.66	5.40%
Tywyn / Deganwy / Llandudno Junction														
Deganwy 1	171.27	58.92	5.11	0	5.11	8.70%	5.41	0	5.41	9.20%	4.97	0	4.97	8.40%

Ward (LSOA) with WIMD (Cluster Area Ward highlighted)	Total Ward Area (ha)	Town Area in ward (ha)	Amenity Trees 2006 (ha)	NFI Cover 2011 (ha)	Total Cover TCWTC 1 (ha)	Total % Cover TCWTC1	Amenity Trees 2009 (ha)	NFI Cover 2011 (ha)	Total Cover TCWTC 2 (ha)	Total % Cover TCWTC2	Amenity Trees 2013 (ha)	NFI Cover 2014 (ha)	Total Cover TCWTC 3 (ha)	Total % Cover TCWTC3
Deganwy 2	97.65	56.41	7.34	0	7.34	13.00%	7.63	0	7.63	13.50%	6.91	0	6.91	12.30%
Llansanffraid 2	1546.39	14.21	3.36	0.01	3.37	23.70%	3.57	0.01	3.58	25.20%	3.55	0.01	3.57	25.50%
Marl 1	82.95	63.98	7.2	0	7.2	11.30%	8.16	0	8.16	12.80%	7.1	0	7.1	11.10%
Marl 2	161.68	62.93	5.74	0.82	6.56	10.40%	7.06	0.82	7.88	12.50%	6.07	0.82	6.89	10.90%
Pensarn 1	68.97	51.96	3.85	1.1	4.95	9.50%	5.18	1.1	6.29	12.10%	5.03	1.1	6.14	11.80%
Pensarn 2	216.37	43.82	2.56	1.41	3.97	9.10%	3.23	1.41	4.64	10.60%	3.26	1.41	4.67	10.60%

Table 11: Ward by Ward (LSOAs) Canopy Cover

Town Ditch Road, Conwy

4.4 Summary: actionable findings

Adopting a ward-level focus to identify priority communities for action

Conwy's ward-level data (LSOAs) provides a useful insight into those areas most deficient in tree cover, especially if aligning with those urban areas that have been identified as priorities for town-scale strategic action in section 2.5.

1–570 WIMD wards have already been identified as having serious social, economic and environmental problems. The low levels of tree cover that exist in the majority of these needy communities also emphasise how poorly they are provided for, in terms of pleasant, leafy surroundings. These initial findings are particularly powerful in highlighting the case for action, once further detailed scoping for opportunities has been undertaken.

Regeneration schemes focusing on designated Community First cluster areas should integrate urban forestry improvement measures looking at both quantitative and qualitative enhancement ensuring:

- Amenity trees are present where people live, shop, work and play;
- Existing woodlands are designed and managed to bring value to local communities.

One of the avenues to explore includes reviewing existing regeneration grant funding to make sure quantitative and qualitative enhancement to the local tree resource are qualifying expenditures.

Natural Resources Wales' focus on supporting and targeting action in Communities First cluster areas should, through working with partners, enable a better spatial understanding of where the priority planting needs are. Where realistic opportunities exist, pilot projects need to be resourced, implemented and publicised as exemplar case studies.
(As of October 2016 the Welsh Government has decided to bring the Communities First programme to an end – too recent to re-vamp the focus of the TCWTC study).

Towyn: © Crown Copyright: RCAHMW

5. Estimating the potential for tree planting - a pilot exercise for Conwy

This section presents a desktop methodology that was piloted across a sample 27 urban areas across Wales, including Conwy, to identify where new tree planting might be possible.
The approach and its findings are presented as follows:

To enable tree strategies and canopy cover targets to be fully developed, national and local government not only need a clear picture of the existing resource but also an indication of what's potentially possible to achieve.

A number of cities in the United States have been particularly proactive, in conjunction with the United States Department of Agriculture's Forest Service, in underpinning urban tree management with canopy cover mapping, stocking level information and canopy cover targets. This is all part of a far more structured approach to urban forest management than exists in the UK. *Planning the Urban Forest* and *Sustaining America's Urban Trees and Forests* are two useful introductory publications by the American Planning Association and Forest Service respectively.

Over and above existing canopy cover data, many US cities now have information on land that is potentially 'plantable' and could form 'Potential Canopy Cover' (PCC). This often focuses on:

- Impervious areas, particularly streets, through assessments of 'stocking levels'; the number of street trees that can realistically be planted within a neighbourhood.
- Green space – based on land allocation and context.

The pilot assessment of tree planting potential, conducted as part of the TCWTC study, does not have the sophistication of American models. The datasets available to Natural Resources Wales confined this exercise to identifying 'green' land without existing canopy cover. It was not possible to identify potential 'grey/impervious' land, albeit these are often the locations in tough challenging urban environs where canopy cover is most needed.

Whilst not offering a holistic assessment of the realm of the possible, the method adopted below offers the advantage of highlighting potential 'easy wins': tree planting is typically less expensive in soft landscape environs than in hard landscapes. Trees are also likely to have better chance of survival and better fulfil their genetic potential (i.e. grow as big as they can) if they have access to large soil volumes.

Twenty-seven pilot towns were selected across Wales' 22 local and three national park planning authorities based on selecting a major county town per authority, e.g. Conwy.

Three basic categories have been identified within the urban boundary:

- Existing cover (based on 2009 canopy cover survey & NFI woodland data);
- Grey, impervious and blue areas – i.e. buildings, roads, rail and water – which might provide opportunities for tree planting, particularly along streets or within civic spaces and parking lots, but which were not included within the scope of this study;
- Green areas that theoretically could be recruited for additional tree planting, and could help increase the overall local canopy cover – i.e. areas of bare soil, grass and beds of shrubs / young trees.

The aim, of this pilot exercise is to:

- Highlight green areas to investigate for potential new (and low-cost) tree planting within, a) each urban area, b) their constituent wards, and c) each land-use category on a ward-by-ward basis.
- Offer observations as to where the key opportunities to investigate lie, in particular where the study's findings are already making the case towards increasing canopy cover in certain towns and wards.

5.2 Potential green areas for targeting tree planting – the Conwy pilot

Assuming that the existing tree cover level remains stable as new planting conducted in target green spaces achieves 100% coverage of all these areas, Table 12 above shows that canopy cover could potentially increase by 40% in Conwy, resulting in an overall tree coverage as high as 64%. In reality, several constraints will reduce the actual potential for increase:

- Achieving a sustainable cover in the target green areas will take a significant amount of time. Maintaining tree cover levels in existing areas will require good planning and management, underpinned by a good understanding of required tree replacement rates (and capacity to implement the required replacements). The age pyramid and species distribution of the existing tree stock will have a strong influence on the timeframe within which this will be achievable.
- Achieving a 100% cover in the target green areas is unlikely to be suitable or desirable without compromising other highly valued benefits associated with green spaces e.g. playing fields, biodiversity sites with open habitats, allotments, etc. Ground-truthing and community engagement is required, to narrow down the identified wide range of potential green locations, to ear-mark realistic and suitable sites for planting, and to determine a consensual canopy cover target.

URBAN AREA	Urban Area (ha)	'Grey' Areas (ha)	Existing Cover * (ha)	'Green' areas for potential planting	**2009 Cover* %**	Potential cover increase** %	**Existing* + Potential** Canopy Cover %**
Conwy	203	74	48	81	24	**40**	**64**

Table 12: The potential to increase canopy cover in Conwy by assessing green space without trees.
* Assuming existing tree cover remains stable overtime; ** Assuming 100% coverage is achieved in green areas targeted for planting

The figures presented in Table 12 confirm space is available to consider undertaking new planting. Together with the constraints and associated mitigation steps presented above, this suggests a methodology and starting point to begin defining approaches for increasing the local urban tree resource. What is encouraging is that those already identified as 'low cover' towns, especially Holyhead, Port Talbot and Rhyl, are all rich in green areas where increasing canopy cover might be possible.

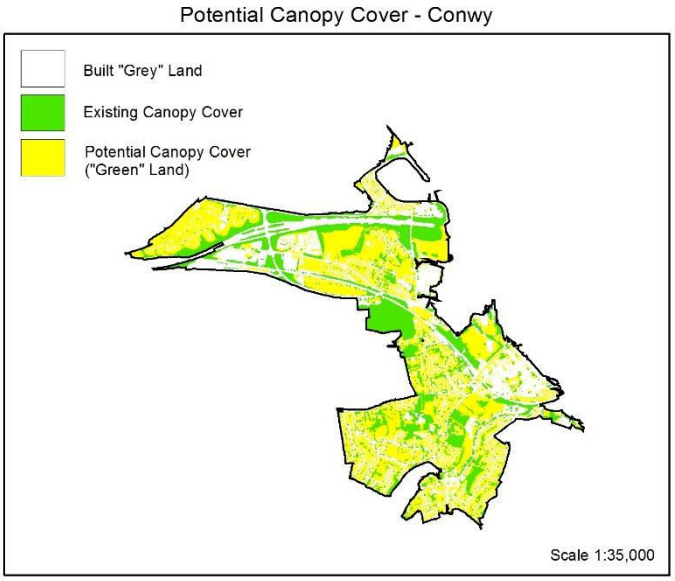


Figure 14:Conwy's canopy cover and green areas with potential to explore new planting

Conwy: © Crown Copyright: RCAHMW

5.3 Summary: actionable findings

All towns and wards offer scope for increasing planting and canopy cover

The pilot analysis of potential areas for tree planting has focused on what might be considered as 'easy wins': tree planting in green spaces has fewer constraints, and often lower upfront costs, than accommodating trees within hard landscapes.

Results have shown that large tracks of 'green' land – both public and private – seem to offer potential for tree planting. However, a detailed, on-the-ground appraisal is needed to enable decision makers to fully understand where planting is most achievable and desirable, so as to plan effectively for a more substantial and robust urban forest.

Consideration of this town assessment approach to potential canopy cover would benefit from:

- Feedback from stakeholders, especially local authorities, as to the usefulness of this approach. Closer analysis of and comment on each county's pilot town findings would be useful.
- An indication as to the merits of expanding the approach to other towns.
- Exploring methods to best identify and map potential 'grey' planting areas.

The importance of identifying land-use and available 'green' and 'grey' areas in understanding where it's feasible to plant and set realistic canopy cover targets

The pilot conducted has also shown that in some of the densely populated and more challenging areas, focusing exclusively on green areas for spotting opportunity to increase tree cover was not enough. The approach to mapping potential areas for planting across both green and grey areas to the level of detail that US cities adopt, deserves to be investigated further and utilised as the way ahead for realistically developing tree strategies and setting urban canopy cover targets.

The next steps here would be to:

- Engage with pilot local authorities keen to take this approach to the next level of investigation;
- Select a pilot town or county, and work to build up comprehensive site-based data, enabling an approach to setting meaningful canopy cover targets.

Woodhill Road, Colwyn Bay

6. Conclusion: disseminating, refining and updating the data

The 'Tree Cover in Wales' Towns and Cities – Conwy' study makes a significant contribution in pinpointing where and how much tree cover the county's towns possess. Making the most of these finding requires concerted efforts towards:

6.1 Disseminating the data

Communicating the Conwy County Borough's findings

The target audience is the Conwy County Borough Council's policy and programme formulators, the chief executive and heads of department, politicians, professional practitioners and organisations working in both, the urban green space realm and, less advantaged communities.

Copies of this county report are available from: **urbantrees@naturalresourceswales.gov.uk** , to where queries on its content can be forwarded.

The national TCWTC report and summary can be accessed by visiting the urban trees page on NRW's website.

Data sharing

The county and national reports are supplemented by:

- Visiting the County Local Evidence Packages from the Infobase Cymru website, to identify those towns assessed for their canopy cover.
- Accessing the Welsh Government and Natural Resources Wales Lle geo-portal website for the study datasets in GIS and tabular formats.

6.2 Improving and updating the dataset

Gathering feedback

Comments on the usefulness and format of the data provided in the county report would be welcome via: **urbantrees@naturalresourceswales.gov.uk** .

Following the 2016 updated TCWTC study main report and summary, continued feedback on the methodology used, the findings and next steps will be sought from the target audiences.

This will aid Natural Resources Wales to further, a) refine the evidence gathering approach, b) build on where there are gaps in knowledge, and, c) work closer together to promote urban canopy cover

Aerial photography

The next planned aerial photography capture for Wales is due in 2017. It would therefore be timely, if feasible, following the 2006, 2009 and 2013 aerial assessments, to carry out a Phase 4 survey in 2018-19. With a suite of aerials of the same resolution spanning eight years, the picture of change in canopy cover comparison will become that much more reliable.

Pre-2006 aerial photography is potentially available to test change over time for specific towns and areas of interest.

The urban boundary

A review of the land-use rules, boundary checking and, in the light of any feedback, the urban areas as currently defined by Natural Resources Wales would be beneficial. Consideration should be given to aligning with the Conwy County Borough Council's 'settlement boundaries'.

Tree and canopy data

To provide more consistent canopy cover figures, the urban NFI components need to be analysed more closely, and where canopy diameter does not exceed 3.0 metres, these need to be omitted from the findings.

No ground-truthing has been done to date, e.g. does taking the median for each of the three tree size categories give a fair reflection of actual canopy cover?

There would be merit in separately identifying canopy cover for those 1.0–3.0 metre diameter trees - their contribution to those 'grey' areas in low cover wards, while not adding greatly to canopy cover, does have an important 'greening' impact.

What would be useful is to ascertain to what degree the Conwy County Borough Council has, in recent years, invested heavily in planting which has yet to register as canopy cover, or has there been minimal or no programme of young recruitment planting.

Consider other tree and canopy data capture techniques, e.g. infrared hyperspectral imagery to identify tree height and species.

There is a case for adding additional layers of specific tree interest, partly related to canopy cover, e.g. tree preservation orders (TPOs), historic, ancient and veteran trees.

Public – private land ownership

There would be value in identifying private and public tree cover in towns, i.e. where Conwy County Borough Council could influence change greatest. Public land could be categorised further e.g. parks, street trees or educational, in the quest for more informed management and seeking out opportunities for planting. Identifying canopy cover and planting opportunities on land holdings, such as Registered Social Landlords, would appear in line with much of the WIMD and 'Communities First' cluster area focus this study has adopted.

Potential planting

The planting opportunities pilot assessment for Conwy deserve more investigation and validating on site. Case studies would help to raise the profile of this approach to setting canopy cover goals. Consider extending the approach to all towns along with refining the methodology, especially identifying potential paved 'grey' areas for trees when suitable datasets are available.

Cross-referencing datasets

The cross mapping with WIMD has been revealing and it would be equally invaluable to do more research against datasets such as air quality, health, temperature, flood risk, property values, crime, wildlife connectivity and access to green-space. In terms of an ecosystem approach these would no doubt highlight particular urban areas that would benefit from additional canopy cover.

This study only identified trees and woodland within the built boundary. Urban fringe woodland is also important for potential recreational access and as a backdrop to life. An assessment of the degree of woodland beyond town boundaries would highlight communities lacking in trees on both counts, making their case for 'action on the ground' greater.

Valuing the benefits of tree cover

In due course NRW, The Open University and Forest Research intend to upload this study's dataset onto the Treezilla 'Monster Map' site as point data. Over time Conwy County Borough Council, community groups and individuals can input species, girth, height, crown and ground surface information to those specific trees, which then generates values as to the benefits that tree provides society.

The 'Valuing Wrexham's Urban Forest' i-Tree Eco report (2014) revealed an understanding of the county's urban forest structure and also crucially quantified and valued the ecosystem benefits urban trees provide. The report highlighted the cost / benefit effectiveness of trees in contributing to tackling many of today's urban challenges from infrastructure provision to the health and well-being of communities. Similar studies have been completed in 2015 for the Tawe catchment and Bridgend County Borough.

6.3 Using the findings: sustaining and growing canopy cover

The TCWTC study provides Conwy County Borough Council with a critical component of the evidence base they need to produce a tree and green infrastructure strategy that can be embedded in policy through guidance, development and related infrastructure plans. However, a tree strategy must be fully costed to realistically sustain and grow the urban forest. To this end Conwy County Borough Council first need to know their tree resource. A major outcome from the strategy should be the setting of a local canopy cover goal, grounded in a good understanding of their existing tree resource – which the TCWTC data goes a long way in facilitating.

The TCWTC study provides the Conwy County Borough Council and others with solid evidence of the state of the county's urban forest, both in terms of extent and distribution as well as of its evolution. This has highlighted some important issues regarding:

- Canopy cover loss: the TCWTC study show clear evidence that 8 urban areas have lost canopy cover between 2009 and 2013.
- Canopy cover discrepancies between towns and wards.
- Unfulfilled potential to better use land for increasing cover.
- The findings provide grounds to undertake a review on current legislation and guidelines as to their effectiveness on delivering ecosystem goals, e.g. TPOs and ensuring robust conditions are adhered to on development sites.

The TCWTC study provides local community champions and third sector organisations, such as local tree ambassadors and tree wardens, with an open source dataset to inform their work in taking local action to increase and care for canopy cover, as well as to spread the word about the value of trees to the wider public:

Public Service Boards have a crucial role to play in bringing together public, private and voluntary organisations to address issues where tree cover can offer solutions.

Active local campaigners groups such as GAG (Greener Aberystwyth Group) work tirelessly to raise tree and green space issues amongst fellow residents and work alongside Ceredigion Council. Their existence has been very much a contributory factor in securing the 2012-14, £375,000 funded, Coed Aber project.

Examining the neighbourhood tree approach, adopted successfully in many US cities and piloted over here in places such as Hackney, London and Bristol, there is potentially the appetite to engage more fully with residents in tree-planting and on-going maintenance projects.