Promoting Landscape and Biodiversity in Developments

Wexford County Council

29 November 2022

Tony Williams

Landscape architecture – and the practical use of science

Tony Williams

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Transport Infrastructure Ireland

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IFLA World Climate Change Working Group (IFLA CCWG)
European Voting Member.
https://www.iflaworld.com/climate-change-working-group

Promoting Biodiversity (as part of our normal activities)

- Construction Planning:
- Luas Cross City project as an example of integrating the natural world , and making a more Biodiverse ecosystem (more of everything in the urban / peri-urban and rural settings)

- Engineering and planning the interventions is crucial to ensuring successful outcomes

- Work on the details. How will it be done ? and who will do it ? Include this in contracts (but carefully)

- The following is an example from Luas Cross City (Tramway Construction in Dublin)

Workshop of 14 Nov 2022. Key Themes

- From an analysis of the comments and suggestions, the following were considered the key themes emerging based on the topics discussed. The analysis was focused on how the various topics may be managed through the development and planning processes. This must then be further developed so as to to be managed through three differing 'work streams'. It is imperative that some means of ensuring the 'whole picture' is developed and that resources are provided within the final planning and development processes.

  - The main themes would seem to be

    - Standards / Specifications / guidance (ensuring coherent delivery of design and implementation)
    - Education (informing and involvement of all)
    - **Governance** (set policy)
    - **Management Practices** (in order to ensure the implementation of policies)

Workshop of 14 Nov 2022. Some Key Points

1. Focus on planting native plants
2. Enforcement post-planning
3. Confusion about pollinators
4. Provenance of species, look within 10km to support that system
5. Guidelines on riparian zones
6. Land use – protect lands, water quality
7. Climate Action Plan – Carbon Calculators with planning applications
8. Tree management policy & stock of trees

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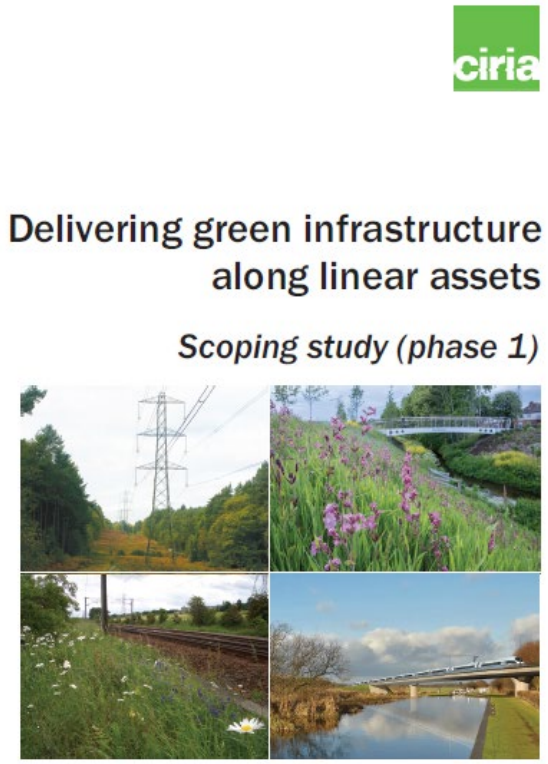
Standards and Specifications

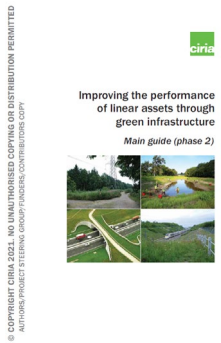
for inclusion of Blue Green Infrastructure (BGI), Nature-based Solution (NbS) and biodiversity

- Lessons from our research on the provision of BGI on linear Infrastructure (roads, rail, tram, waterway, powerline, etc)
- Application of engineering and scientific principles within the design and construction phases.
- Clear guidance must be provided.
- Costing and estimation based on the expected resilience of using Nature-based Solutions (NbS) in order to build Blue Green Infrastructure (BGI) Networks.
- Data based on actual projects and examples.
- Lessons may be used in general planning and construction of large and small scale development
- Ensures positive overall landscape interventions.

Continuing Research in TII

Blue Green Infrastructure and Nature-based Solutions





Current Research with CIRIA includes

Green Infrastructure (GI)for Linear Assets

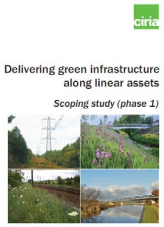
- Phase 1 scoping https://www.ciria.org/Resources/Free_publications/Green_infrastructure_along_liner_assets_scoping_study_p1.aspx
- Phase 2 Guidance published in 2022

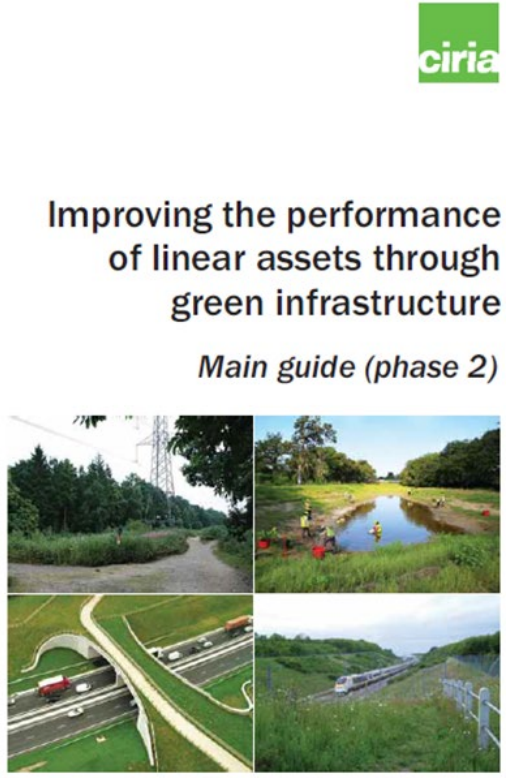
Part 1 Delivering GI Assets along linear Infrastructure – Scoping the research and guidance

Part 2 Improving the performance of linear assets through green infrastructure

Continuing Research in TII

Blue Green Infrastructure and Nature-based Solutions





Current Research with CIRIA includes

Green Infrastructure (GI) for Linear Assets

- Phase 1 scoping
- Phase 2 Guidance on improving the performance of BGI published in 2022

https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C772F&Category=FREEPUBS

Part 1 Delivering GI Assets along linear Infrastructure

Part 2 Improving the performance of linear assets through green infrastructure

Definitions

Blue Green Infrastructure (BGI)

Green Infrastructure (GI)

GI is defined as:

"...an innovative way of protecting biodiversity while simultaneously contributing to sustainable and smart growth. It is defined as a strategically planned network of natural and semi-natural areas, which deliver a wide range of ecosystem services in terrestrial and marine areas."

International Union for Conservation of Nature (IUCN, 2014)

Design at the outset

Ref CIRIA Guidance (Phase 2)

Benefits of BGI as part of asset management

- ⌘ reduce the costs of the assets and their operation, and improve their reliability and resilience
- ⌘ meet government objectives and requirements for climate change mitigation, resilience and adaptation
- ⌘ create multifunctional blue-green networks which will increase the amount of natural habitats and
- ecological features, thus providing biodiversity gains.
- ⌘ create high quality and distinctive local places which are attractive to businesses and investors
- ⌘ deliver ecosystem services and natural capital for wider environmental,
- economic, social and societal benefits (HM Government, 2018)
- ⌘ mitigate the impacts of new developments, which include impacts to water, carbon, noise,
- biodiversity, air quality and society
- ⌘ reduce the need for conventional grey infrastructure by supplementing or replacing with a suitable
- GI alternative
- ⌘ improve the health and wellbeing of communities by providing spaces for recreation and attractive
- routes to promote active means of transport (eg walking and cycling).

Ref CIRIA Guidance (Phase 2)

BGI – Ecosystem Services (ES) and benefits

Provisioning services		Regulating services				Cultural services	
Fish production		Air quality regulation		Noise regulation		Aesthetic experience	
Food production		Carbon storage		Pest control		Education	
Water supply		Cooling and shading		Reduced energy		Interaction with nature	
Wood production		Erosion protection		Recycling/ reduced waste		Recreation	
		Flood regulation		Water quality regulation		Sense of place	
						Supporting services	
						Habitats and biodiversity	

Figure 2.1 *A range of ecosystem services and benefits*

Ref CIRIA Guidance (Phase 2)

BGI Wider Benefits

Communities	• Greater inward investment. • Reduction in unused land. • Improved modal shift towards sustainable and active transport. • Improved connectivity. • Improved health and wellbeing. • Enhanced user experience. • Reduced visual impact. • Reduced flood risk. • Noise and air pollution buffers.	• Increased economic activity. • Improved cohesion and inclusivity. • Healthcare savings. • Reduced costs associated with crime. • Enhanced access to nature. • Increased opportunities for recreation. • Enhanced and protected local character. • Cleaner air and water. • Increased biodiversity. • Reduced costs of pollutants and contaminants. • Carbon sequestration. • Carbon and energy savings.
Developers	• Saleability. • Increased property prices and land value. • Inward investment opportunities. • Improved planning permission prospects. • Improved environmental reputation. • Contributions towards corporate social responsibility targets and requirements.	
Landowners	• Reduced heating and cooling costs. • Increased property value. • Opportunities for revenue generation. • Reduced flood risk.	

Ref CIRIA Guidance (Phase 2)

BGI Components

Ref CIRIA Guidance (Phase 2)

Management Practices (in order to ensure the implementation of policies)

Masterplanning

Big ideas are needed

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National Biodiversity Plan

https://www.cbd.int/doc/world/ie/ie-nbsap-v3-en.pdf

https://www.oireachtas.ie/en/debates/question/2022-02-23/111/

National Biodiversity Plan

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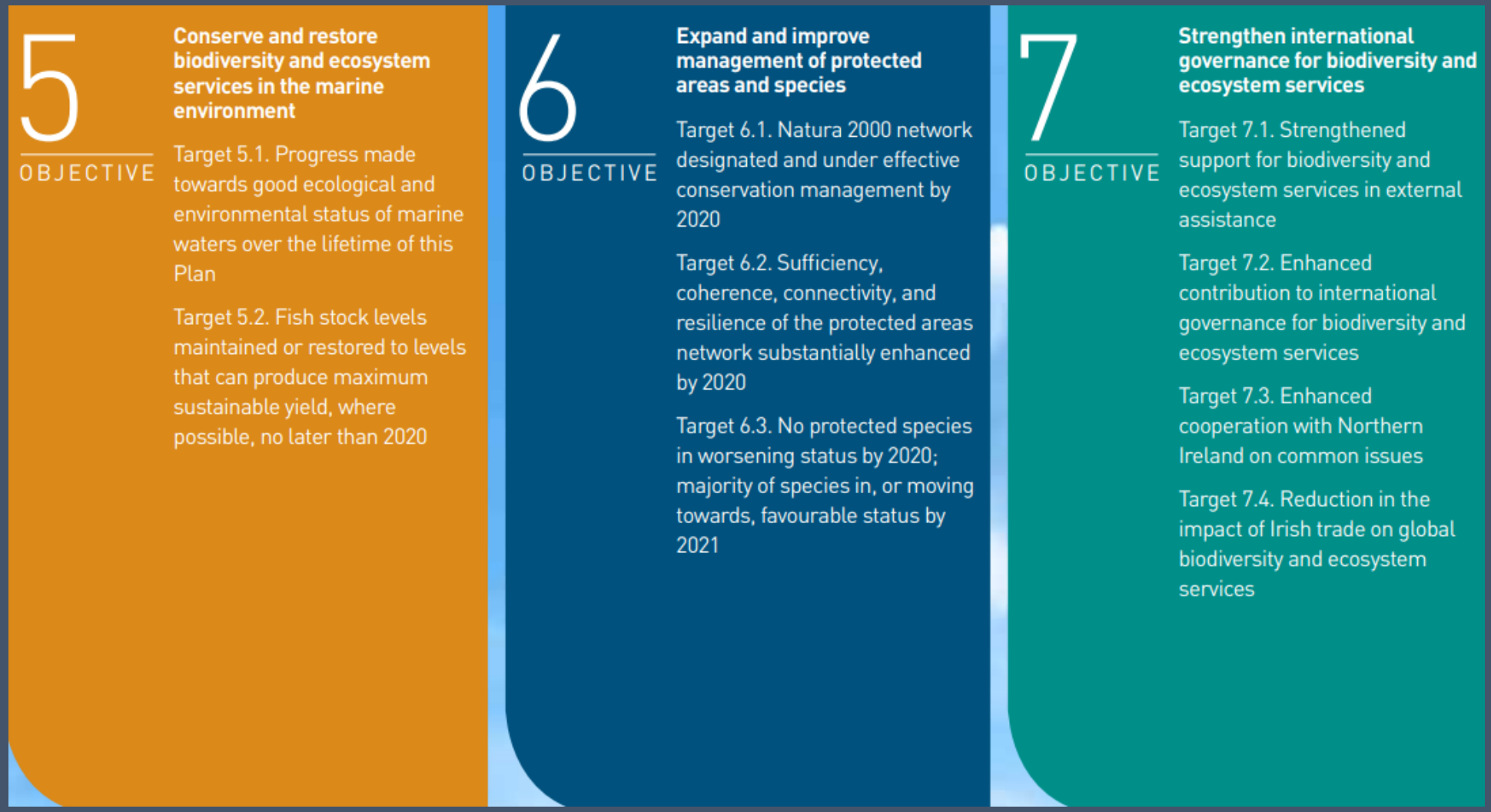
National Biodiversity Plan



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The Global View

Expressed locally

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Projects ….in the global landscape
Expressed locally

IFLA (Global) are involved in developing policies at global (and local) level ……

An approach to ecosystem management as part of ensuring a multidisciplinary approach (starting with Landscape Architects and Traditional Architects)

The aim is the delivery of the principles of BGI into the implementation of all projects……and its translation into specifications and standards is needed.

Indigenous Ecosystem Corridors and Nodes
A joint project of the UIA and the IFLA

IEC+N

Linking people and the landscape

https://www.iflaworld.com/indigenous-ecosystem-corridors-and-nodes
Website in development

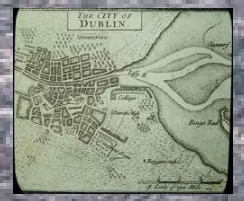
Projects ….in the global landscape
Expressed locally

Dublin Bay

BITHSFÉIR
Chuan Bhaile Átha Cliath
Dublin Bay
BIOSPHERE

https://www.dublinbaybiosphere.ie/

Bull Island, Dublin Bay.
An Island that grew due to the port development (since 1821) and a place for nature and walking.
UNESCO biosphere as the **site for my research**




Projects ….in the global landscape
Expressed locally

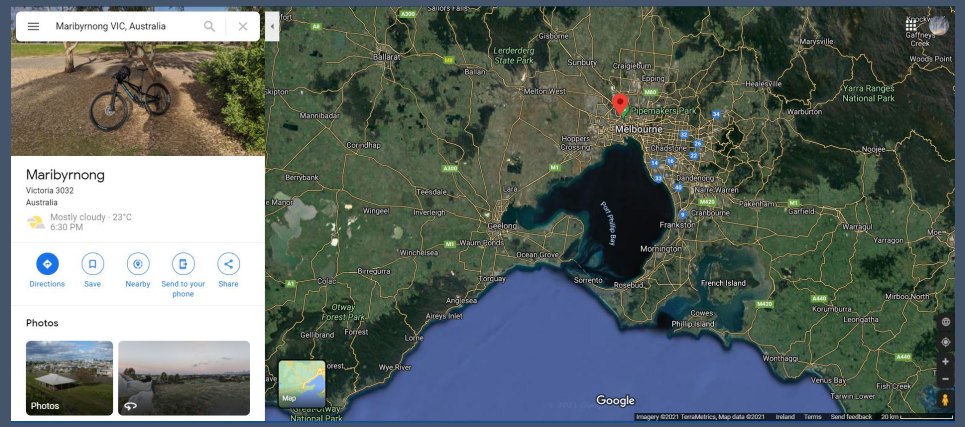
IEC+N Current Project under IFLA / UIA umbrella and addressing 17 UN SDGs (Start up and Concept)

Phase 1. Setting the structures in place utilising existing GO, NGO and community resources. Planned as community Led under Aarhus structures and assisted by the professional institutes.

- Linking ‘living Melbourne’ with ‘Dublin Bay UNESCO Biosphere’

[Living Melbourne - The Urban Forest]

One million, 1,000,000 plus trees planted and ecosystem restoration as the ‘norm’



Aarhus Convention. https://unece.org/fileadmin/DAM/env/pp/documents/cep43e.pdf

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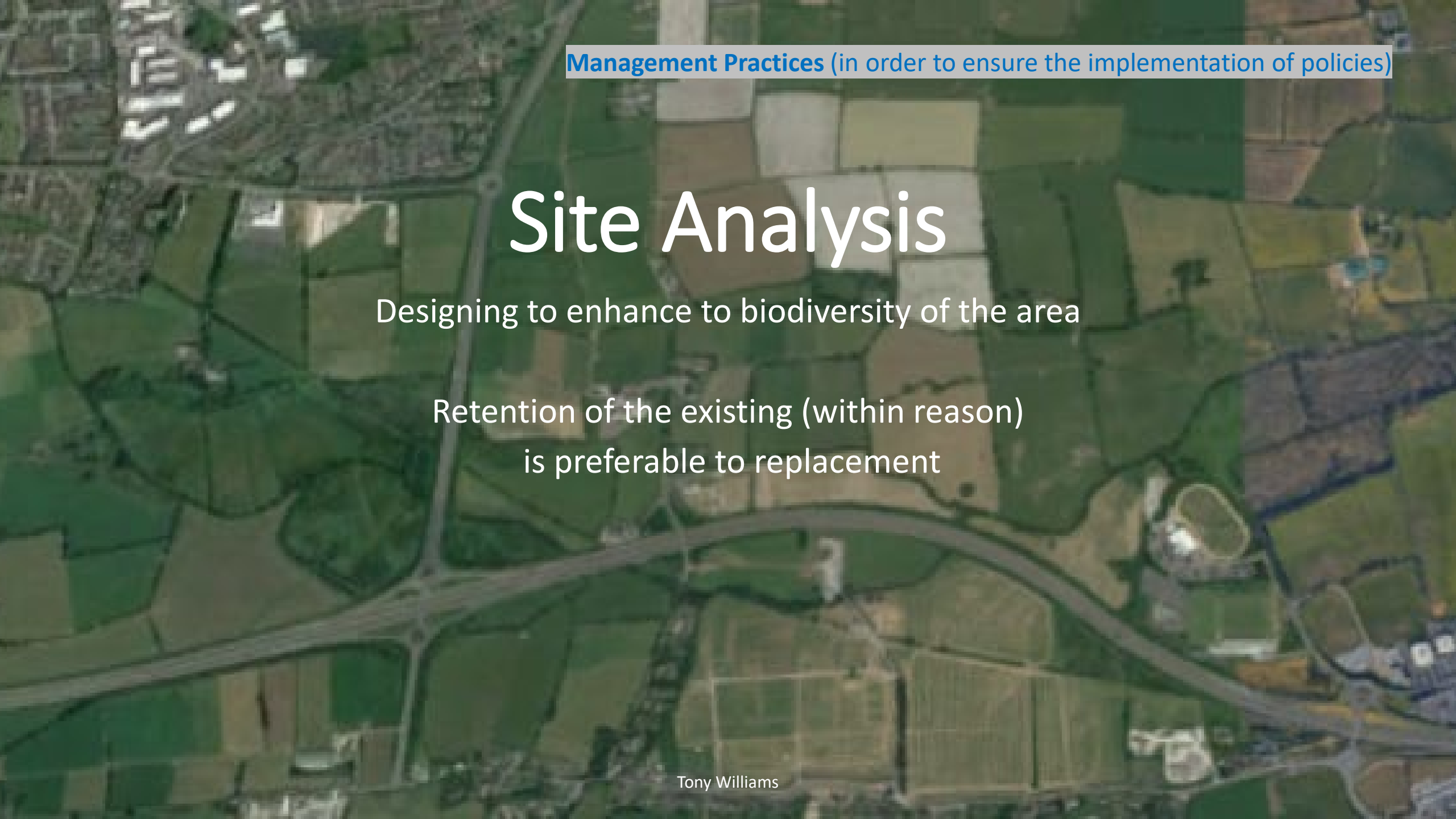

Management Practices (in order to ensure the implementation of policies)

Site Analysis

Designing to enhance to biodiversity of the area

Retention of the existing (within reason)
is preferable to replacement

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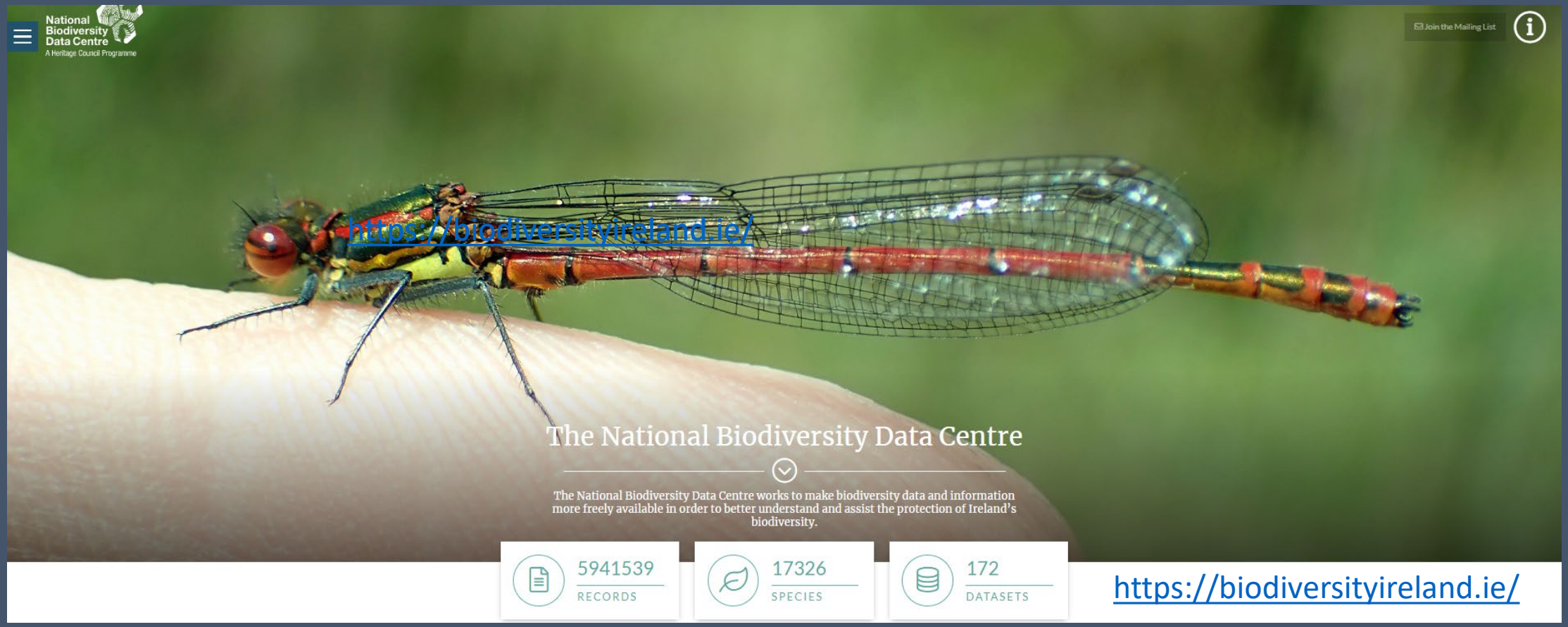
Collect, Analyse and use the data

in order to know the natural world for your locality



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STEM (Faculty of Science, Technology, Engineering and Mathematics)

School of Botany

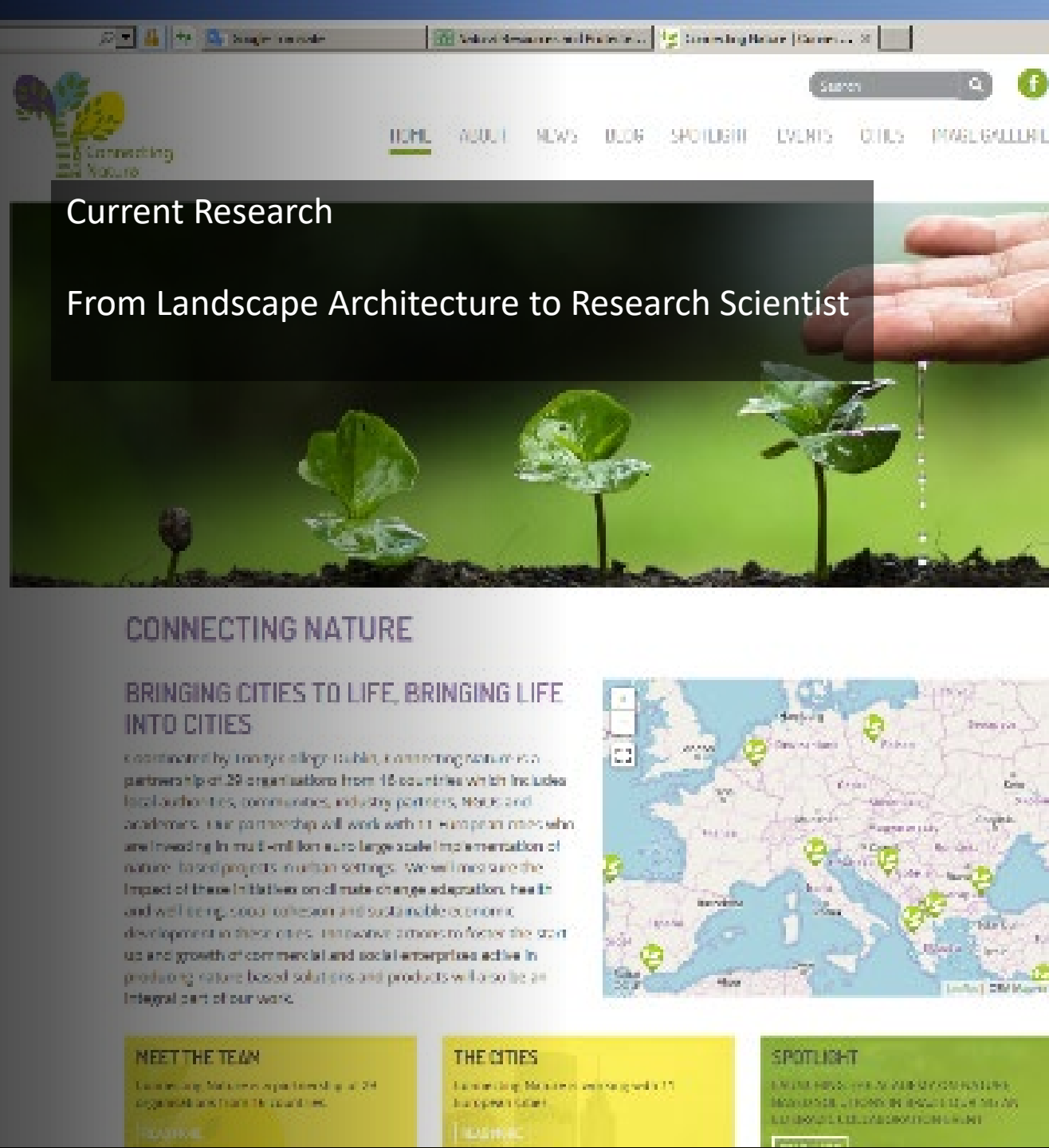
Trinity College Dublin

EU – Connecting Nature

Tony Williams

Supervisor : Prof. Marcus Collier

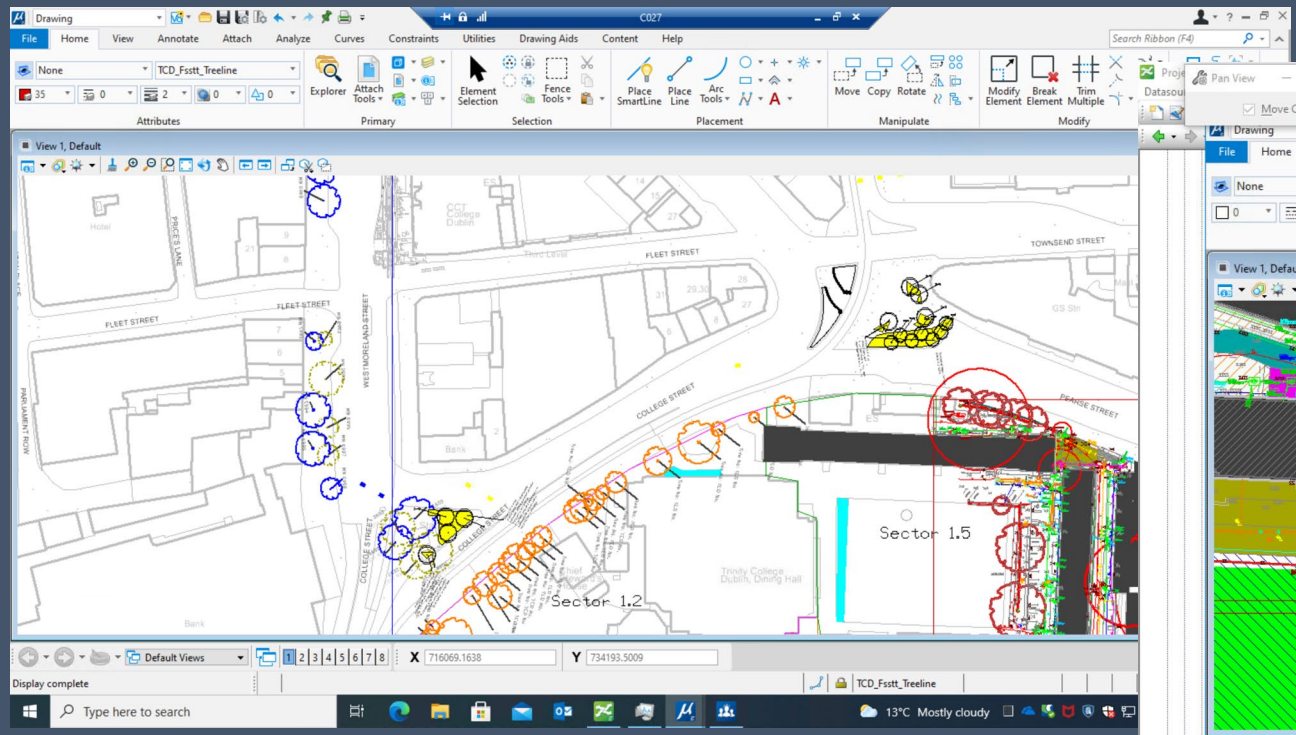
https://connectingnature.eu/

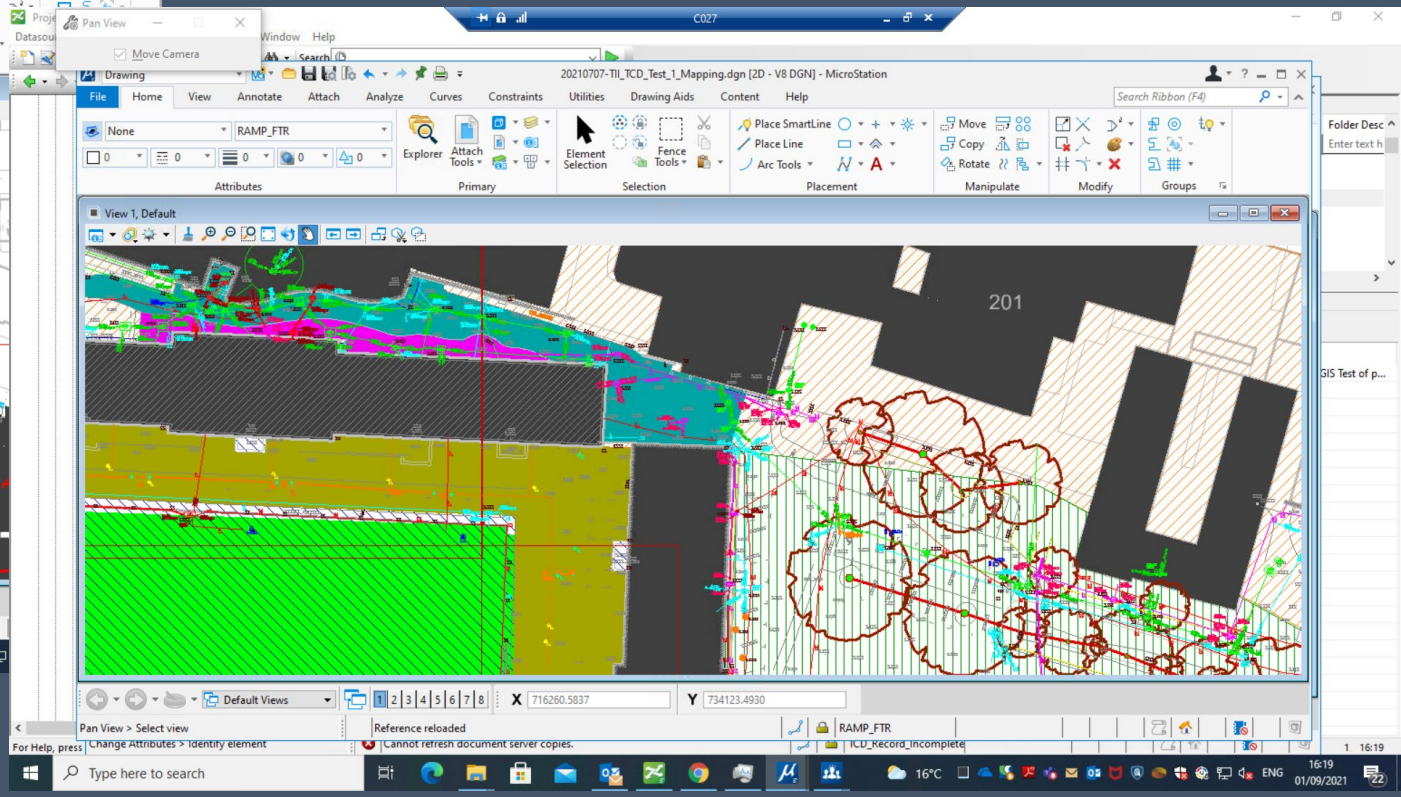


Field Sites

Ecological Fossitt Designations

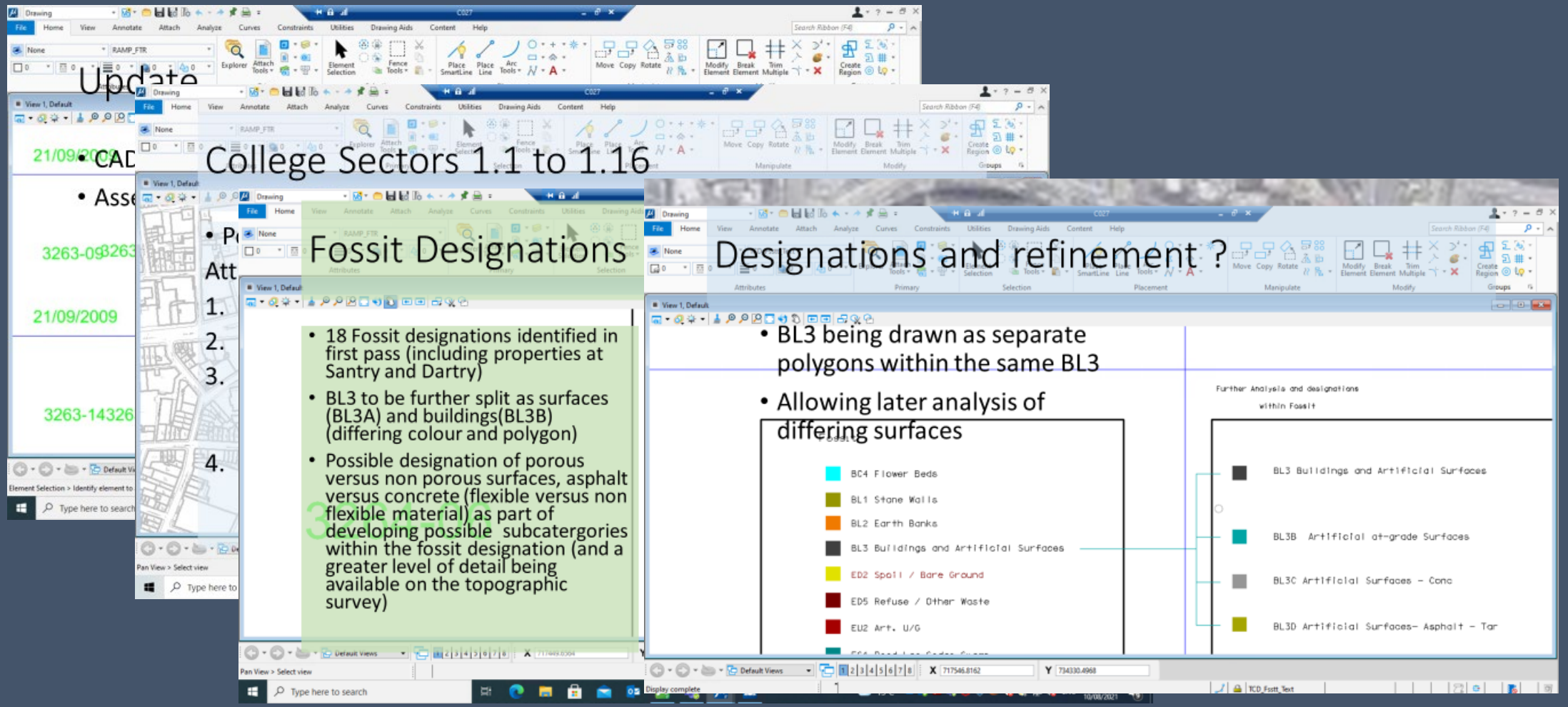
- The assessment of the ecological ‘community’ (including humans)





Field Sites

Ecological (Fossitt) Designations (Fine tuning the data collection)



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Management Practices (in order to ensure the implementation of policies)

Standards / Specifications

Construction Planning

- Luas Cross City, Dublin
- As an example of pre planned introduction of trees and vegetation
- Part of increasing the canopy cover after construction, a net increase
- Concept : Both Urban and incorporating / replacing semi natural (along the canal and old railway cutting
- Design and Stage : Awareness of the existing ecology allowed some sensitivity (Smotth newts caught and moved nearby to the canal area)
- Post Construction Considerations : Residual lands considered for other uses with local authority and community (on going)

An example of multidisciplinary elements
Tree Pit design and Construction
Luas Cross City

Existing and Proposed Trees – Strategy developed

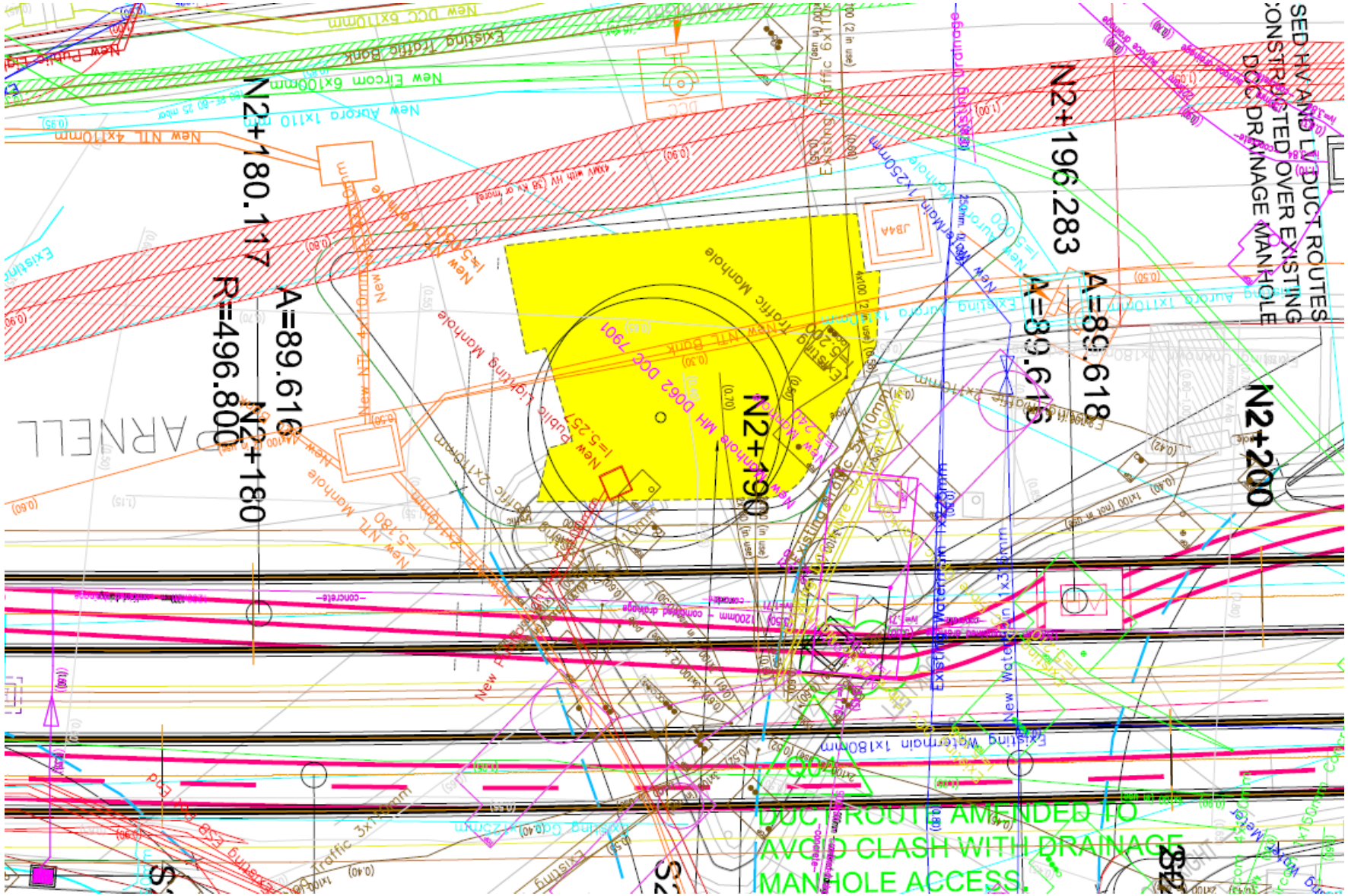
Landscape Architects:
Tony Williams (TII) Laura Flynn and Eimear Fox.
Fergal Parlon – (Brady,Shipman,Martin)

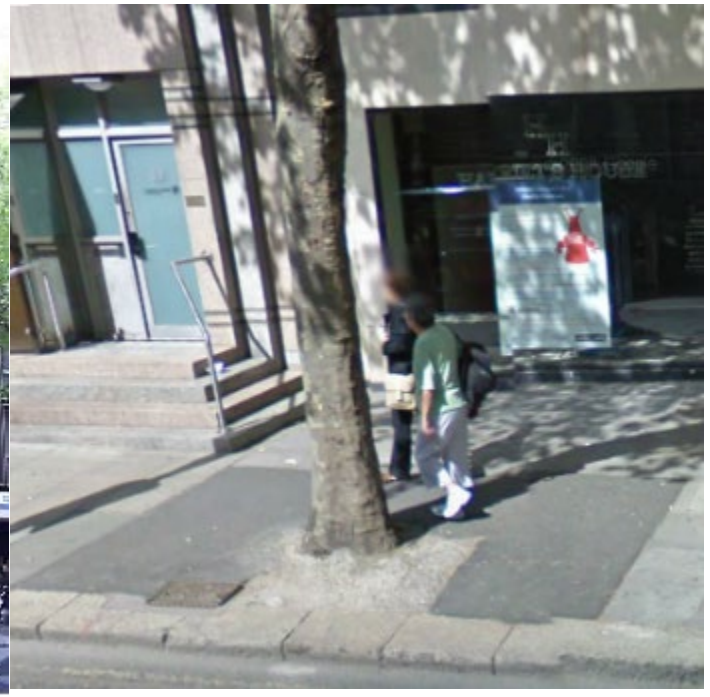
Utility Engineer:
Michelle Merne (TII)

Arborists:
Planning Stage-Ciarán Keating (for TII)
Enabling Works (for GMC) -Felim Sheridan
Infrastructure Works (for TII) –Felim Sheridan
Infrastructure Works (for SSJV) –John Morgan
Environmental Co-ordinator – Colin Wilson

And the design and site team (mostly engineers)

Utilities and Tree Pits – Design in Unison





Dawson Street – Existing London Planes to be retained

LCC (BXD)

Trees - existing

Existing Trees – Strategy

Not without its difficulties

•Challenge to adjust utility layouts in order to avoid impacting existing street trees

•Each trees footprint varies and needs to be designed for its unique position within the new streetscape and kerb lines

•Full aboricultural advice obtained to allow individual street tree details be developed.

•Trees removed only when necessary

•Requirement for aftercare and monitoiring

•Hand over to city and operator

LCC (BXD)
DAWSON STREET

Tree Planting - proposed

New Trees

•Challenge to adjust utility layouts in order to fit new street trees

•Tree grille proposed with infill to match surrounding paving

•Structural soils used as part of build up

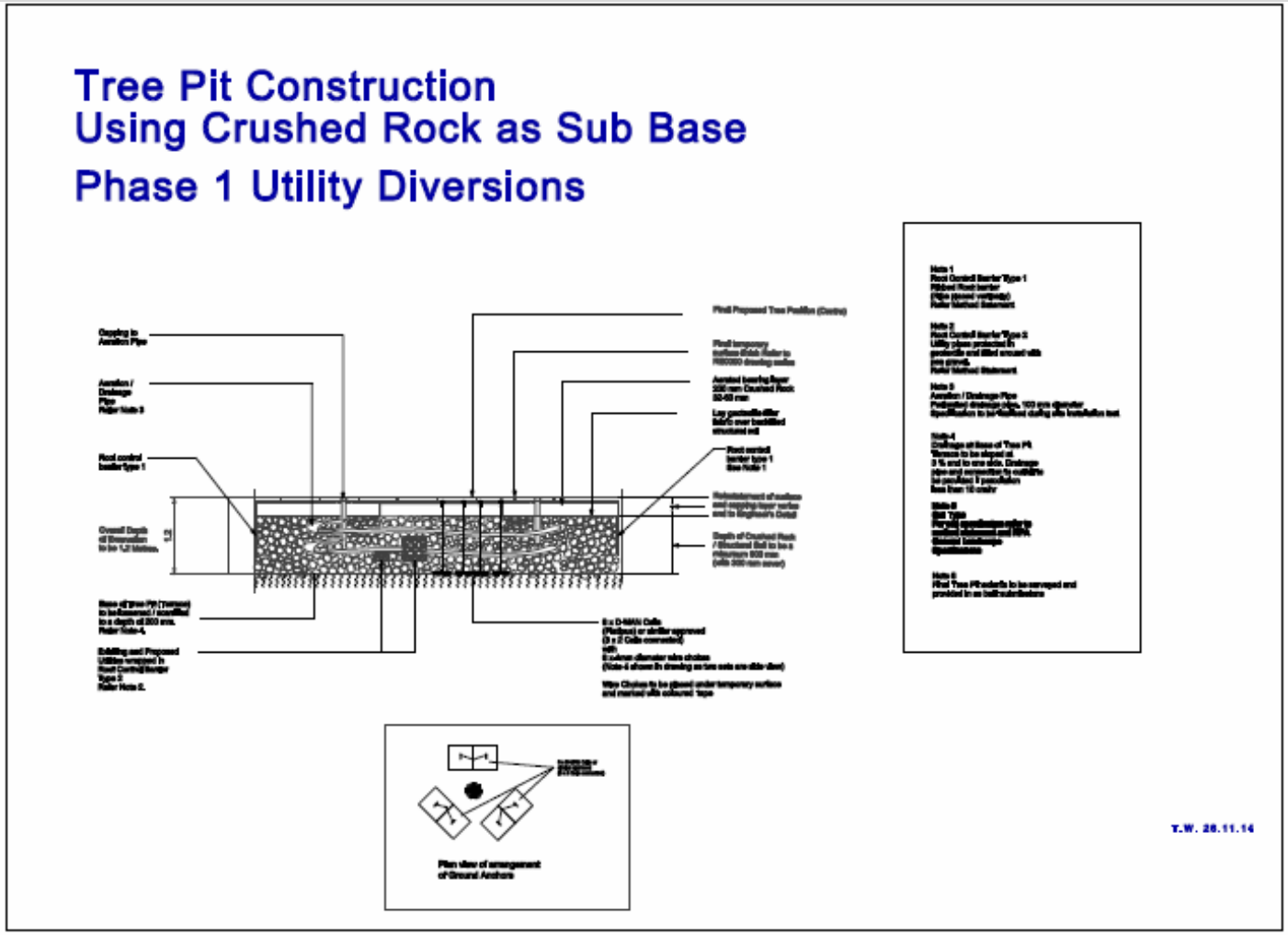
•London Plane tree type used to match existing

•But not always.
•We are aiming to increase the range of species used

Luas Cross City

Urban Design Strategy

Tree Pit Construction



Contractor: GMC Utilities

Arborist : Felim Sheridan

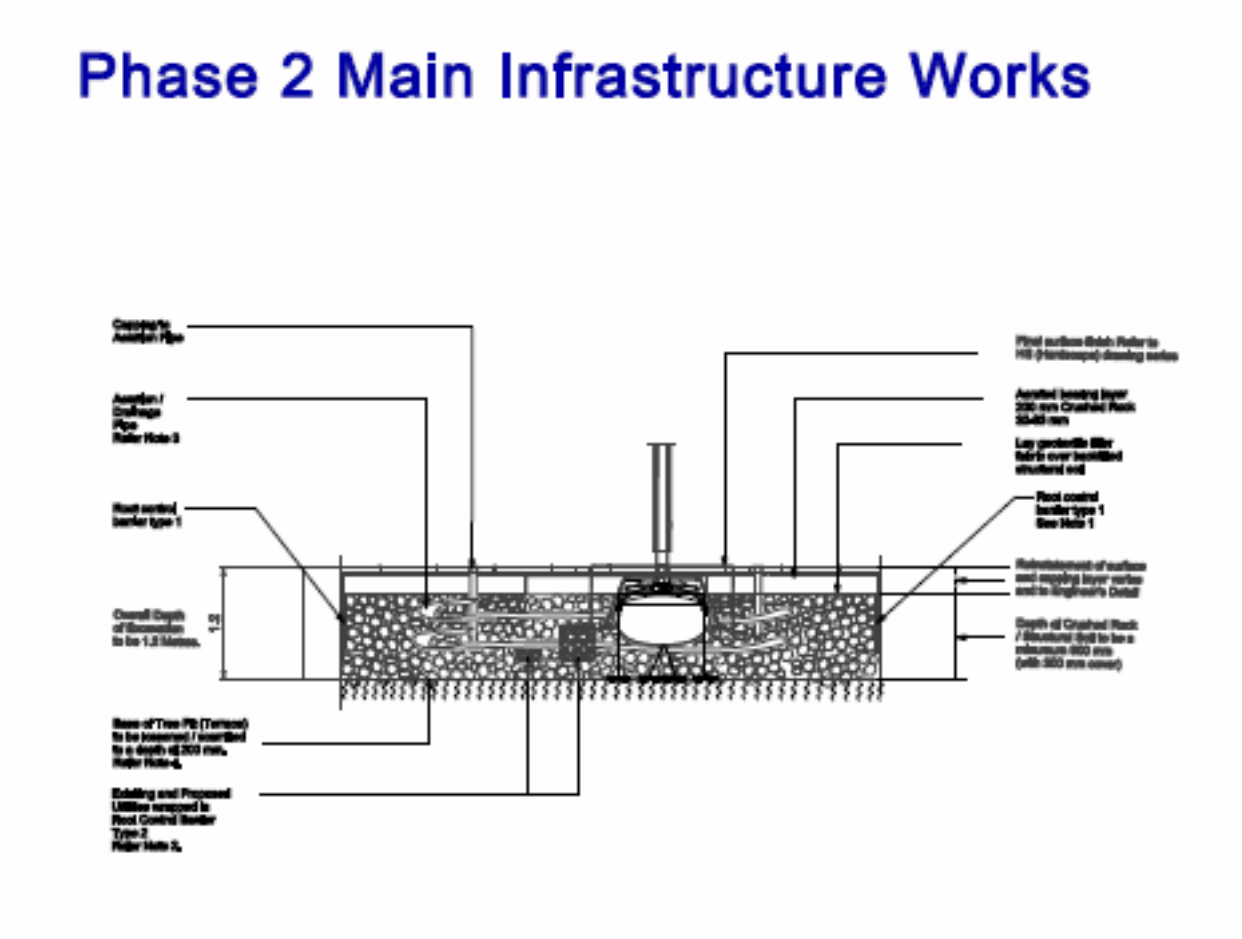
Based on Stockholm Tree Pit Design – Orjan Stahl et al.

Luas Cross City

Urban Design Strategy

Tree Pit Construction

Phase 2 Main Infrastructure Works



Contractor: Sisk Steconfer J.V.

Arborist : Felim Sheridan

Arborist : John Morgan

Ecologist : Colin Wilson

Landscape Architect : Fergal Parlon

Based on Stockholm Tree Pit Design – Orjan Stahl et al.

Luas Cross City

Urban Design Strategy

Tree Pit Construction

Utilities incorporated at Design Stage

Examples of O Connell Street Tree Pit Construction.

Pre Planting

Luas Cross City

Urban Design Strategy

Tree Pit Construction

Construction Challenges

Ireland

During and post Construction

Luas Cross City

Urban Design Strategy

Tree Pit Construction

January 2017
Final surfacing complete

O Connell GPO Tramstop

Pre Planting

Luas Cross City

Urban Design Strategy

Tree Pit Construction

Management Practices (in order to ensure the implementation of policies)

Standards / Specifications

Plant Materials

Using native species (mostly)

Ornamental and non-native with care

Wild flower seeds to be locally sourced

Pollinator friendly species are favoured. All-Ireland Pollinator Strategy

Tony Williams

Trees

- Pollinator trees (flowers (not fruit))




Trees	To suit each individual bay	Using Pollinator species and Using the existing trees as a reservoir of resistant or potentially resistant

Low and General Planting - Infrastrcucture
(Shrubs / Ground Covers etc)

Plant materials matched to a management strategy

Planting MS 1	**High maintenance / ornamental. At safety points and as part of DRA mitigation.**	• **600 mm high and to 1.2 metre depending on positions**
Planting MS 2	General Maintenance	• Ornamental and variety for hammerheads. • Further detailed in 1:50 or appropriate scale planting plans
Planting MS 3	Low maintenance naturalised	• Grasses and wild flowers. Self seeding and cut and removal of arisings twice per season

Low and General Planting
(Shrubs / Ground Covers etc)

Planting MS 4	**Swale and wetland area**	• **Drainage from the adjacent hard standing.** • **Allowance for standing water and species diversity.** • **Viewing areas and science stations for visitors.**

Hedges

Hedges	**Along medians in combination with fencing**	• **Cotoneaster, Ceanothus, and other species for biodiversity (Flowering Shrubs)** • **Assist in wayfinding**

Standards / Specifications

All Ireland Pollinator Plan

https://pollinators.ie/

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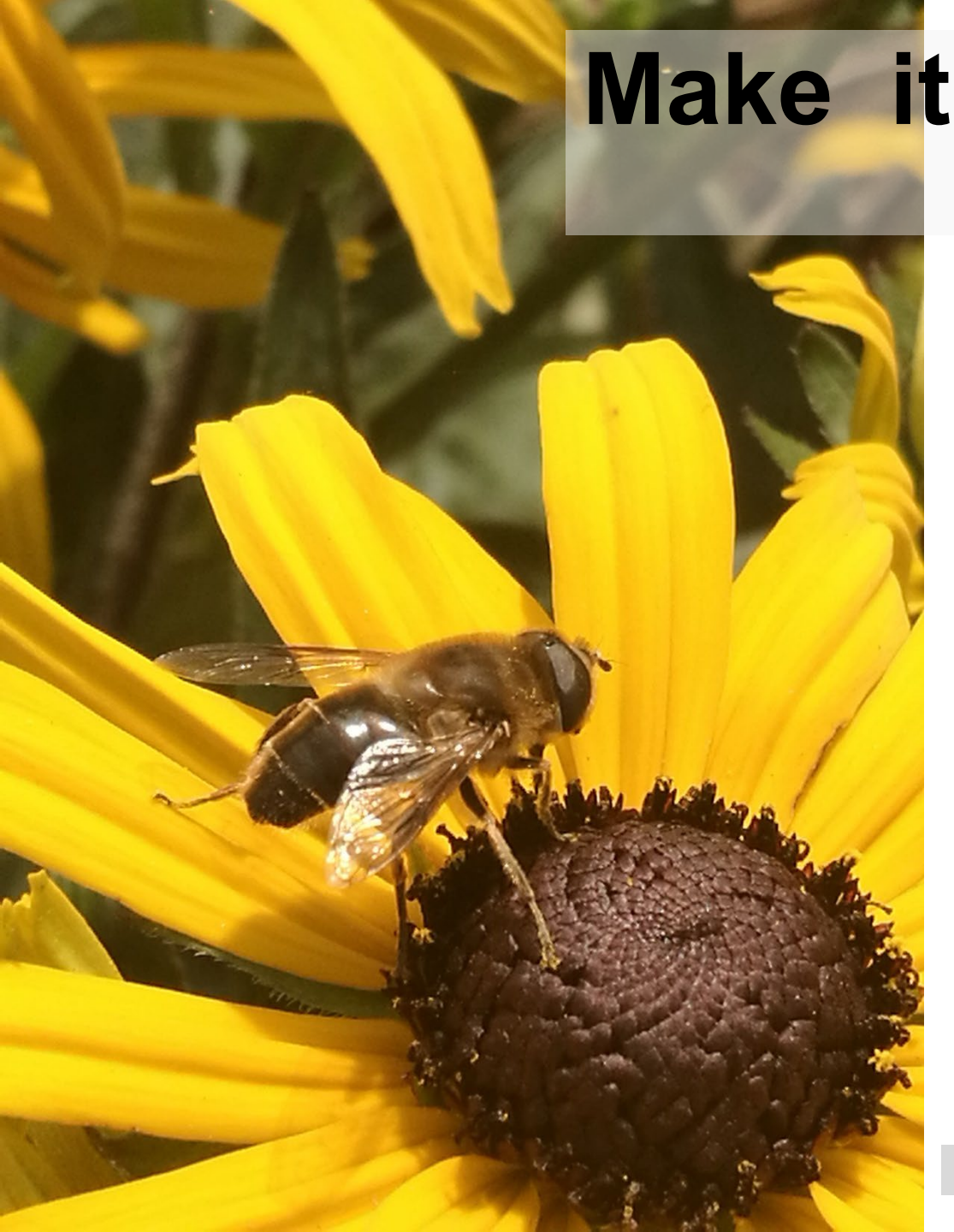
cuthbertpeter@ymail.com

https://pollinators.ie/

Through the eye of the Pollinator

Peter Cuthbert BSc Agr (Hort)

https://pollinators.ie/



Make it better for pollinators

Native wild flowers

(and locally sourced seed)

Allow natural colonisation to occur

Peter Cuthbert BSc Agr (Hort)

https://pollinators.ie/

Provide nesting opportunities

Close to food sources (Pollen and nectar)

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- Ivy on trees as an ecosystem
- Hedgerows

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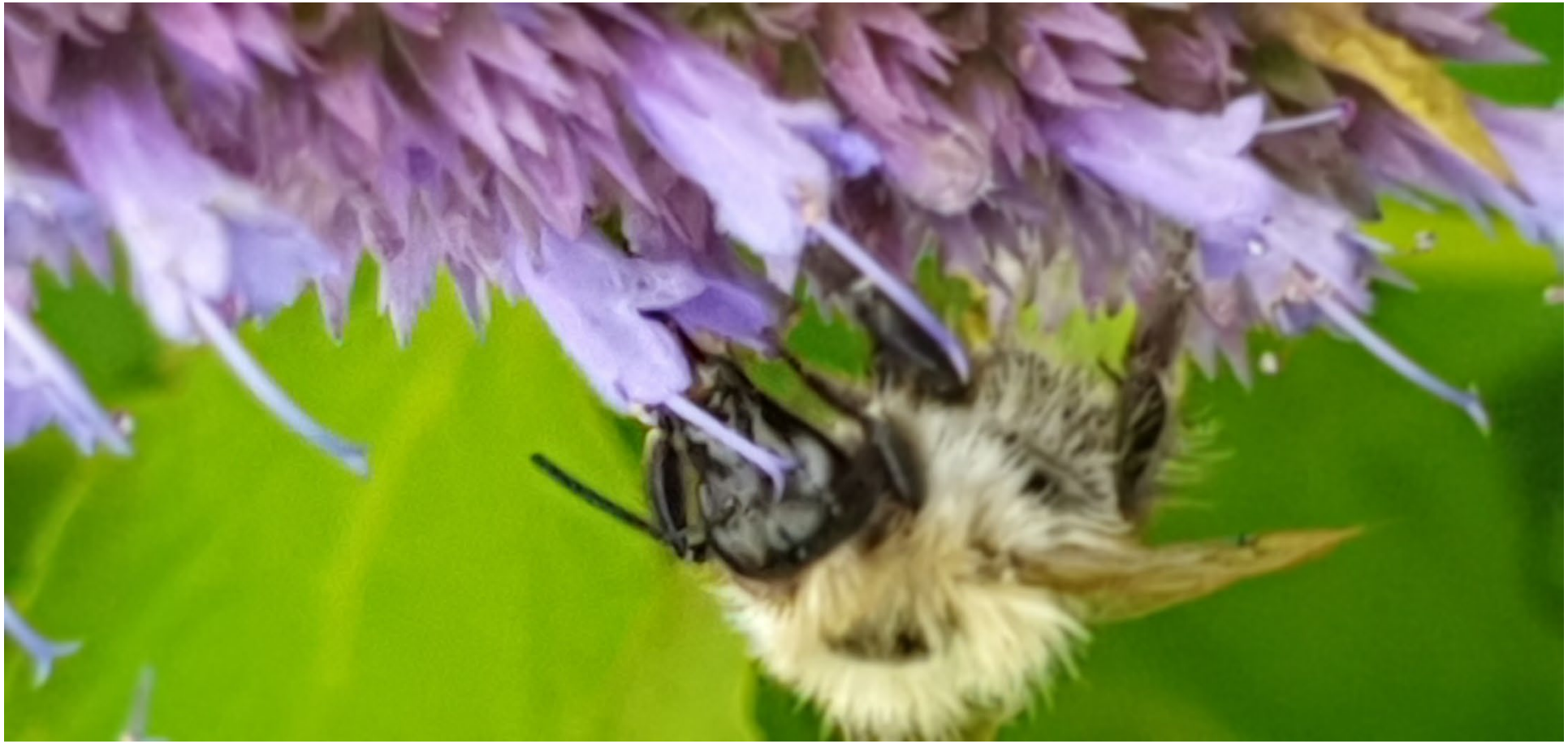

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https://pollinators.ie/

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https://pollinators.ie/

Next Steps

- Biodiversity audit of the site and linking to the locality and the region (the Biodiversity Audit Centre are there to assist) https://biodiversityireland.ie/
- Follow the guidance on the All Ireland pollinator plan, National Biodiversity Plan, and promote their use
- Become familiar with the analysis of, and construction on development sites with a view to retention of that which is part of the biodiversity network ….i.e retain as much as possible
- Ensure sufficient space (patch size) and connectivity and linkages to the rural areas (opportunities to link natural sites.
- These activities have been shown to be a benefit to agriculture, nature and economic and social activity)
- Reviewing the possibilities for the inclusion of BGI and NbS **in your site**
- ….with a long term view

A Connemara Landscape
Paul Henry

Go Raibh
Maith Agat

Thank You