

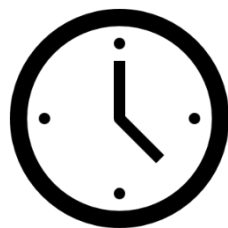
# World Forum on Natural Capital

28 November 2017



# Workshop Objectives

1. Introduce natural infrastructure and its use in cities
2. Explore the opportunities of leveraging natural infrastructure
3. Identify barriers to implementation and enablers towards mainstreaming



- ❑ Introduction & Glasgow city
- ❑ Urban planning lab
- ❑ Sustainable cities & reflections

Natural capital

Natural infrastructure

Ecosystem services

Nature-based solutions

Green infrastructure

Blue-green infrastructure



Istock: shansekala

# Natural Infrastructure for Business Video



# Cities around the world are using natural infrastructure

## Montréal, Canada

Increasing canopy cover for biodiversity and quality of life

## Basel, Switzerland

Green roofs for energy savings

## Oslo, Norway

Valuation of urban ecosystem services to improve city decision-making

## Chicago, USA

Green roofs remediate heat island effect

## New York, USA

Storm water management with raingardens and green roofs



## Ho Chi Minh City, Vietnam

Restored mangroves to protect coastline from storms

## Singapore

Green buildings improving quality of life and air quality

## Bogotá, Colombia

Upstream landscape conservation and restoration for water treatment

## Cape Town, South Africa

Watershed restoration



## Glasgow City Council

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cities to life,  
**Bringing life**  
into cities.



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## EU Goals for Nature based solutions.

- urban regeneration
- improved wellbeing
- building coastal resilience
- understanding ecosystem management
- sustainable use of materials & energy
- enhanced insurance value of IGI solutions
- carbon sequestration.



**The emphasis in this successful bid starts with nature based solutions**



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**GLASGOW CITY REGION HAS A  
POPULATION OF 1.8M**



**GVA IN 2014 WAS OVER £40  
BILLION (ONS)  
32% OF SCOTLAND'S GVA**



**CITY REGION CITY DEAL  
WORTH £1.13 BILLION,  
LARGEST CITY DEAL IN UK**



**33% OF SCOTLAND'S JOBS  
AND 29% OF SCOTLAND'S  
BUSINESSES**



**UK'S LARGEST RETAIL  
CENTRE OUT WITH  
LONDON'S WEST END**



**GLASGOW INTERNATIONAL  
AIRPORT SERVES 110  
DESTINATIONS WORLDWIDE**



**FASTEST GROWING ECONOMY  
IN UK 2013-14 (ONS)**



**130,000+ STUDENTS FROM  
135 COUNTRIES STUDY AT 8  
INSTITUTIONS OF HIGHER  
AND FURTHER EDUCATION**



**SCOTLAND'S  
LARGEST CITY,  
4TH LARGEST UK CITY**

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## Project Overview - GCC role

Complex problem to embed NBS in urban planning policy

**Glasgow** chosen as front runner city because:



- understand the implications of a changing climate
- Collaborative & innovative in relation to NBS
- We try to deal with blue / grey / green spaces across departments, disciplines and partners.
- Working with MGSDP, CSGN, GCVGN, Greenspace Scotland, SNIFFER etc
- Our NBS projects are now at a scale that they are impacting positively on policy,
- We support bottom up / top down solutions

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## A new approach to Open Space

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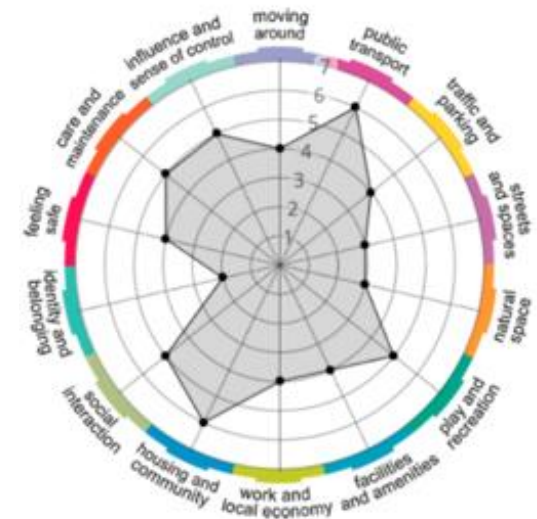
## Think about Place

“Dull, inert cities, it is true, do contain the seeds of their own destruction and little else. But lively, diverse, intense cities contain the seeds of their own regeneration, with energy enough to carry over for problems and needs outside themselves.”

*Jane Jacob*

"Town Planning is not mere place-planning, nor even work planning. If it is to be successful it must be folk planning. This means that its task is not to coerce people into new places against their associations, wishes, and interest, as we find bad schemes trying to do. Instead its task is to find the right places for each sort of people; place where they will really flourish

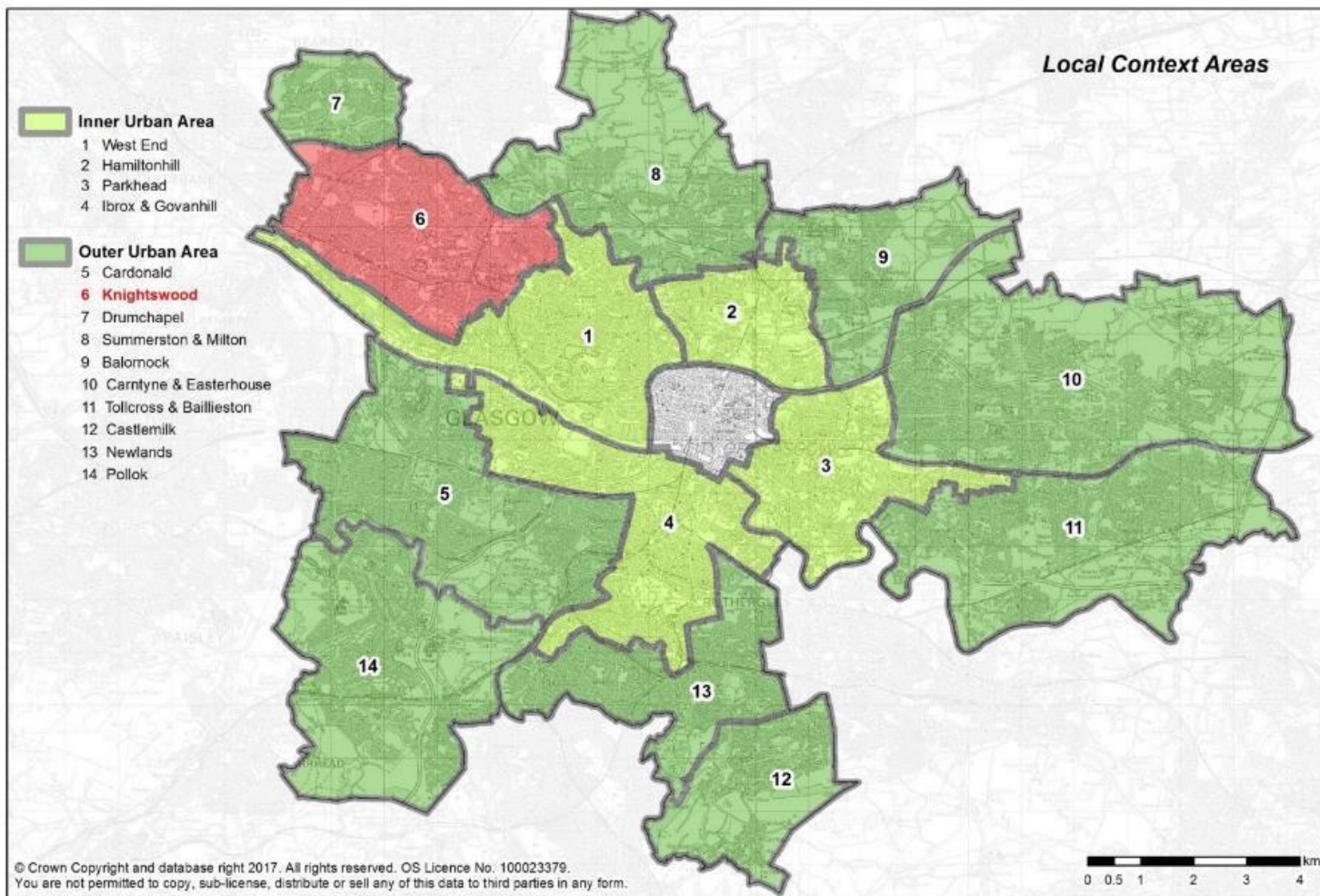
**Sir Patrick Geddes**



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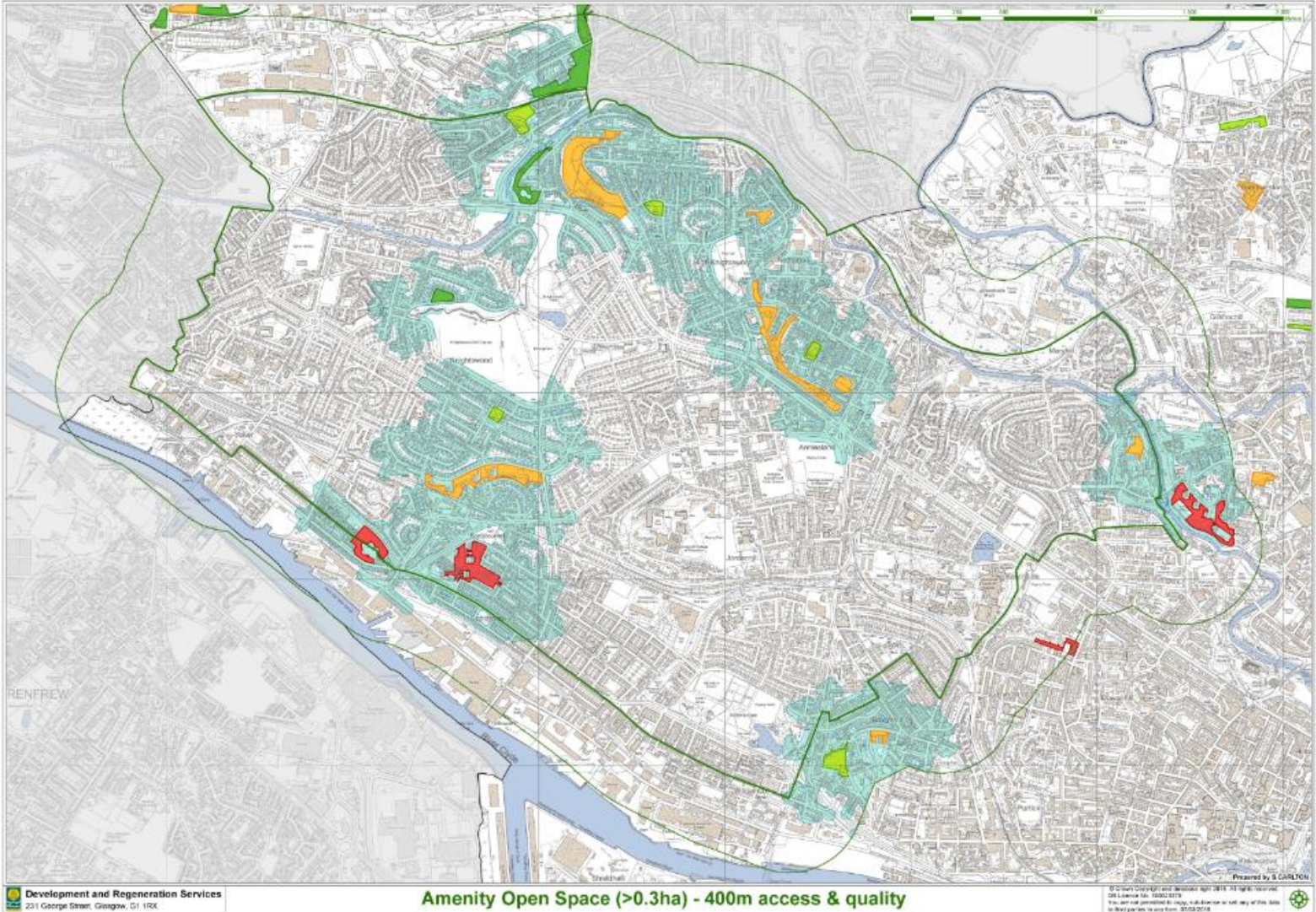
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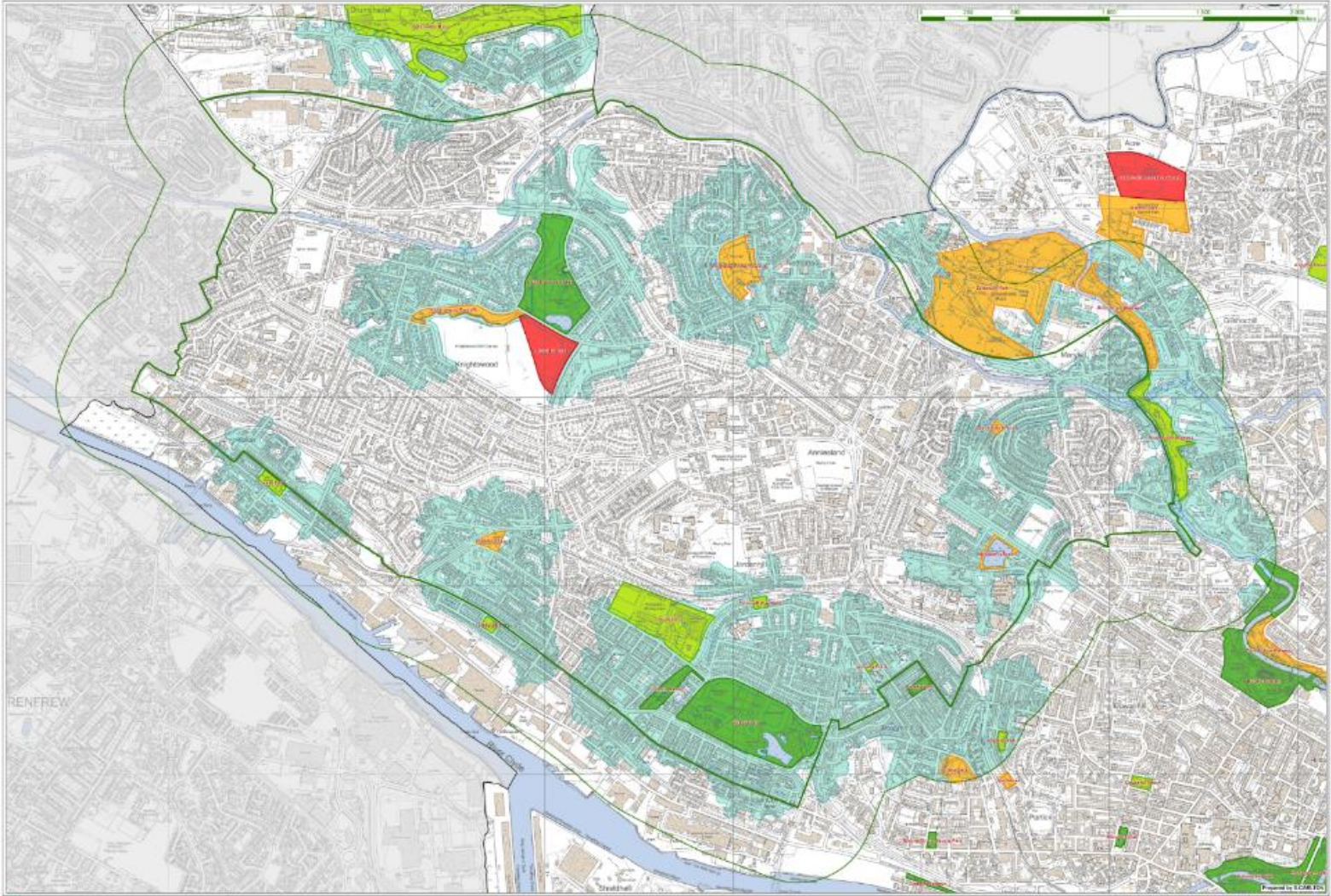




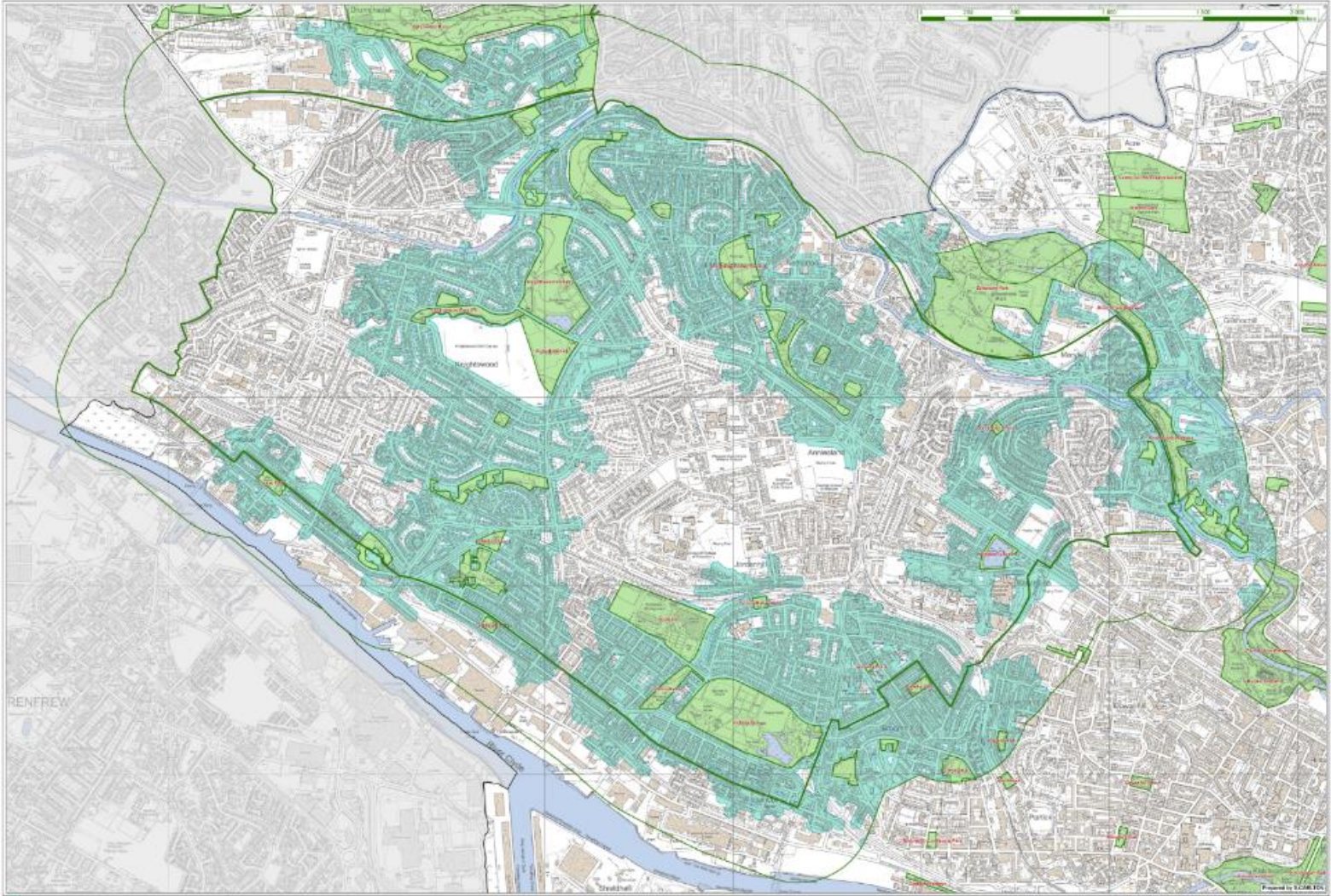












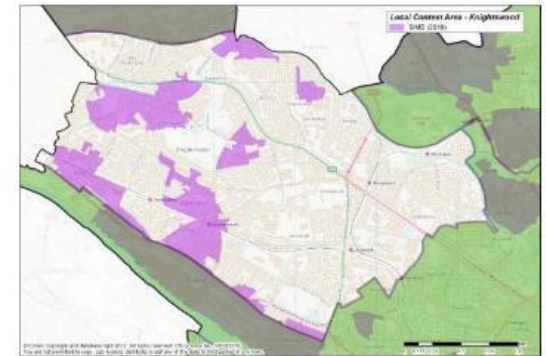


## Local Contexts ( Openspace masterplans) – Understanding areas better

2 Stages:

### Stage 1

- quality of the most publicly usable open spaces
- accessibility to these open spaces
- identification of “gaps
- identification of key issues to be addressed to help meet the accessibility, quality and quantity standards
- consultation through the OSS/SG6 will allow agreement on key actions with the community and other partners to help create better places.



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## Local Contexts ( Openspace masterplans) – Understanding areas better

### Stage 2

collaborative approach with partners to determine how best to enhance and manage the open space resource and ensure it delivers the functions the Council needs it to

will require an enhanced and dedicated staff resource, and close cross-service working

Focus on:

- managing surface water (liaison with MGSDP team);
- delivering enhanced connectivity in active travel networks (liaison with LES, Core Paths Plan);
- meeting gaps in accessibility to publicly usable open space and, where required, enhancing connectivity and quality of these spaces (with LES);
- identifying where it may be possible to release surplus open spaces for other purposes and use compensation for their loss/income generated by their sale for enhancing the remaining open space resource
- taking account of the views of the public in relation to where spaces should be retained/ created/developed for other purposes
- enhancing and connecting habitats and habitat networks; and
- enhancing a sense of place in existing communities, regeneration priority areas and new developments.

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## Challenges that the project will attempt to move forward

- Gathering Robust Evidence – from city activities
- Capturing data / exemplars etc. – to use for peer education; cost / benefit analysis; methodology / process description
- Monitoring – Identify the right type of monitoring that becomes proportionate & meets the needs of both academics & cities
- Methodology – Scalable to city wide; transferable to different contexts
- Demonstrator – Run in Glasgow, scale out city wide; Capture methodology and test replicability in different contexts
- Regulations / Budgets – Economic, social & technical
- Sustainable data – Easy to collect; easy to use; easy to maintain; easy to share
- Fast moving Technology – new apps; Geospatial information communication technology ( G-ICT)



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# Urban planning lab

## Rules of the game:

- Broad assumptions – don't get stuck on details
- Each solution has the same impact: 1 tree canopy equals 1 air-conditioning unit

- Break into groups around the tables.
- Nominate someone for feedback
- Discuss the different solutions that the city could implement within the budget (10), filling the map and the benefits -table.
- You have 15 minutes after which we will go around the room for reflections.

# Request for proposal

## Overview

The city, Greeneva, seeks to increase resilience and ensure long-term prosperity.

The specific **challenges** to be considered in the proposal are the following:

- **Flooding** caused by storm water is expected to rise by 2050
- **Noise pollution** has been a significant complaint by residents (especially around big avenues)
- With longer and hotter summers, **urban heat island** effect has become a concern

## Deliverables

Present solutions for the challenges above within the allotted budget.

You have a budget of 10 squares.

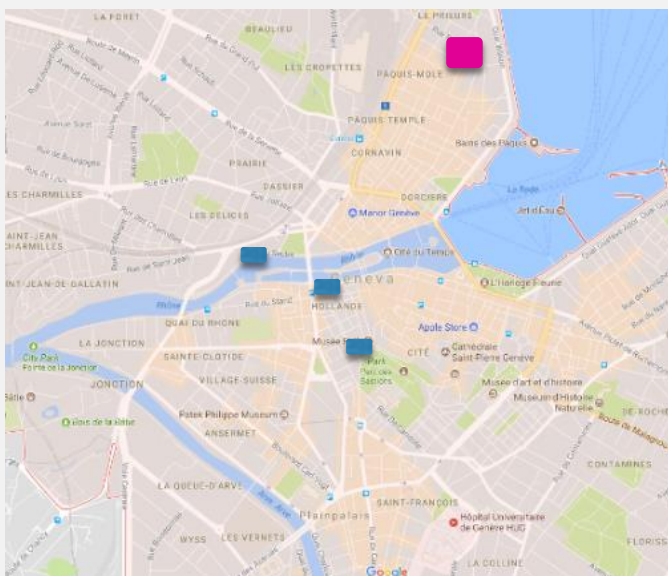
### Geneva overview

- Experiences the four seasons.
- Not susceptible to extreme natural hazards.
- Relatively flat except the old town.



# Set-up

Place the solution on the map where you want it as a urban planner



List some of the benefits and challenges of the solutions

#	Solutions	Benefits & Challenge
3	Green roof	.....
1	Noise barrier wall	.....

**EXAMPLES**

# Solutions (Budget: 10 squares)



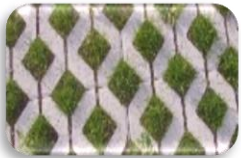
## Green roof

a roof of a building that is partially or completely covered with vegetation



## Air-conditioning

A system that maintains a certain temperature and conditions



## Permeable Pavements

allows for infiltration of fluids, such as water.



## Noise barrier walls

allows for infiltration of fluids, such as water.



## Tree Canopy

layer of leaves and branches of trees that cover the ground when viewed from above



## Gutters, stormsewers & pumps

engineered collection systems that discharge into nearby water bodies or the water treatment system



## Rain garden

allows for infiltration of fluids, such as water.



## Water mists

Systems that spray fine water mist used in streets and outside terraces.

Anything else?

# NATURAL INFRASTRUCTURE: IN AND OUTSIDE CITIES

**World Forum on Natural Capital**

Gregor Pecnik

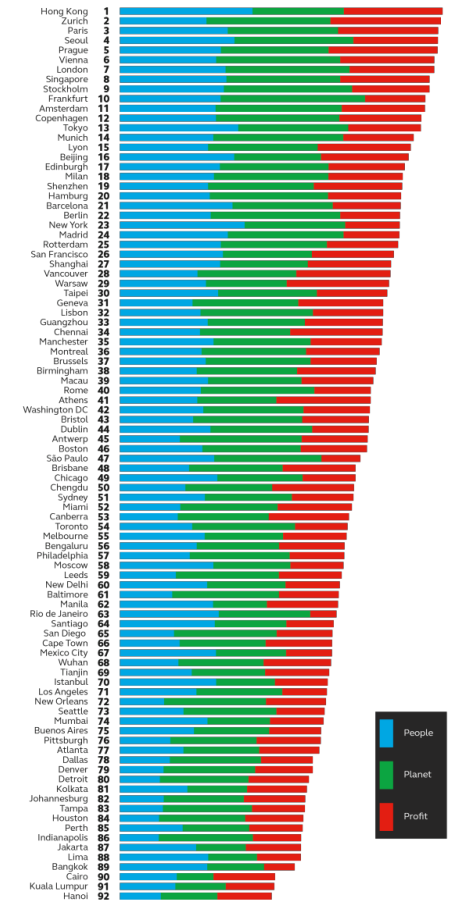
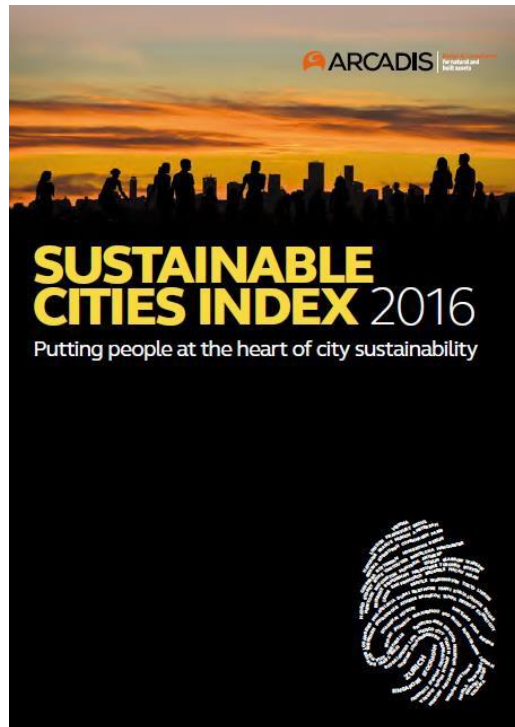
November 2017



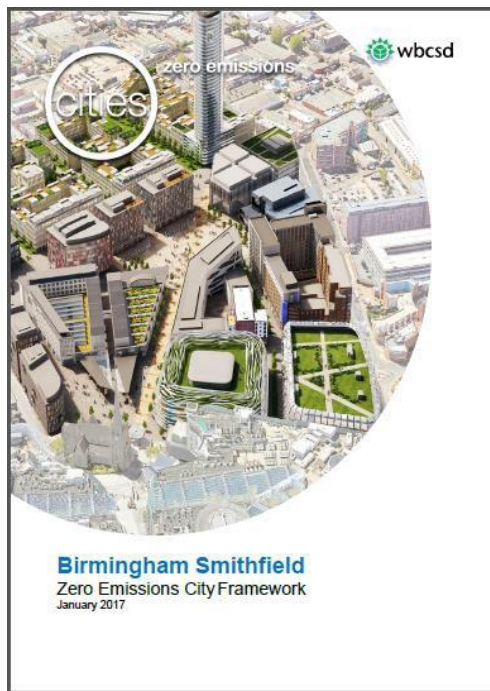
## CONTENTS

1. Natural capital in cities
2. Functional Agro-biodiversity - Multi-Functional Field Margins (MFFMs)

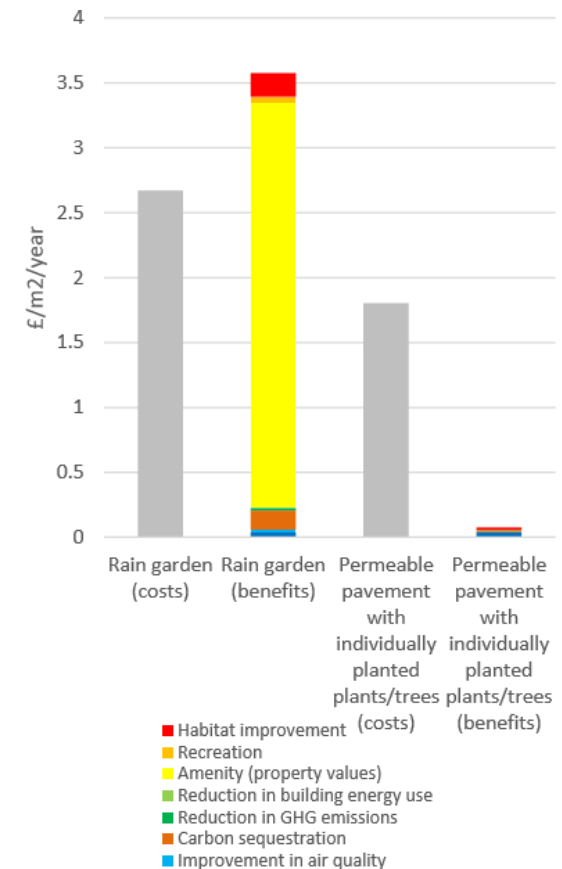
## Measuring sustainability of cities: Sustainable Cities Index



## Zero Emission Cities (ZEC) Birmingham Smithfield Development



- Development of a sustainability framework for Smithfield
- Embedding NC into all of the core sustainability principles
- Identify key interventions to demonstrate their financial viability
- Cost/benefit analysis of green infrastructure solutions.



<http://www.wbcd.org/Projects/Zero-Emissions-Cities>

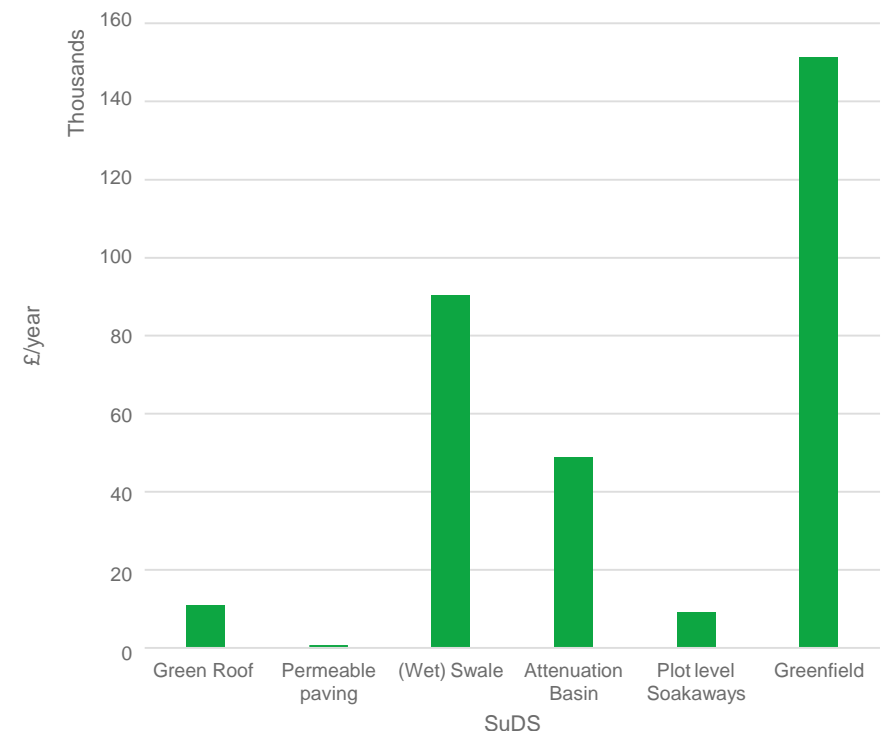


## Delivering natural capital benefits in cities: Implementing SuDS at NW Bicester Ecotown

Natural Capital benefits	Qualification	Quantification	Monetisation
<b>Regulating</b>			
Reduction in flooding	X	X	
Reduction of water treatment needs	X	X	X
Improvement in water quality	X		
Increase in groundwater recharge	X	X	
Reduction in noise pollution	X		
Improvement in air quality	X	X	X
Reduction in energy use	X	X	X
Reduction in GHG emissions	X	X	X
Carbon sequestration	X	X	X
Reduction in urban heat island	X		
<b>Cultural</b>			
Health and wellbeing	X		
Improvement in aesthetics/amenity	X	X	X
Increase in recreational opportunities	X	X	X
Provision of educational opportunities	X		
<b>Supporting</b>			
Improvement in habitat (biodiversity)	X	X	X
<b>Other benefits</b>			
Traffic calming	X		
No delays in the application process	X		
Ecosystem resilience	X		
Marketing opportunities	X		



**Total benefits provided by different SuDS used (in £ per annum) for NW Bicester Exemplar Site**



NB: the results take into account the overall area of each feature.

## Design and Planning: Silvertown Tunnel Crossing EIA

- Nationally Significant Infrastructure Project linking the Greenwich Peninsula and Silvertown in London
- Urban brownfield habitat is undervalued in terms of biodiversity and Natural Capital.
- Brownfield sites are prime development target in London and provide a unique habitat for rare and notable species
- Calculated Natural Capital value of baseline
- Capital sum negotiated for offsetting to be spent as directed in the BAP.



## Functional Agro-biodiversity Multi-Functional Field Margins (MFFMs)

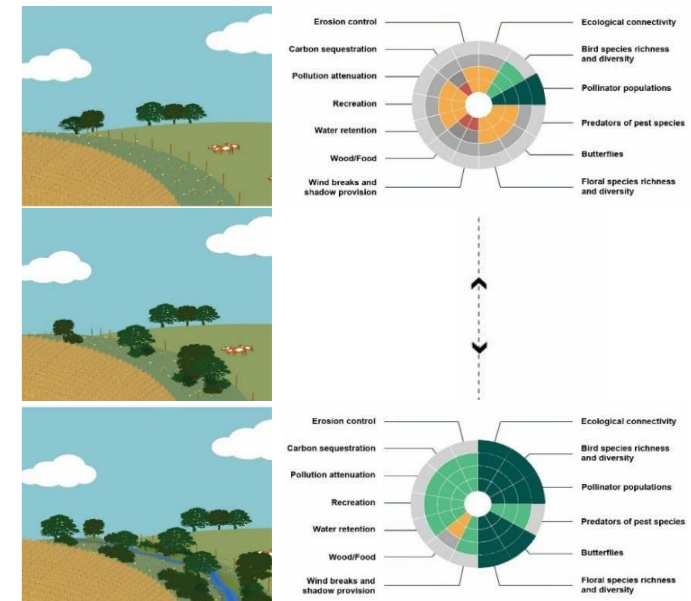
- Creating landscapes with healthy, functioning ecosystems to address multiple social and economic targets.
- Using less productive and marginal farmland to
  - implement natural habitats beneficial for biodiversity, water and soil quality
  - without sacrificing agricultural productivity.
- The whole landscape approach delivers social benefits and business value.
- Promoting MFFM requires multi-stakeholders support and scientific evidence.





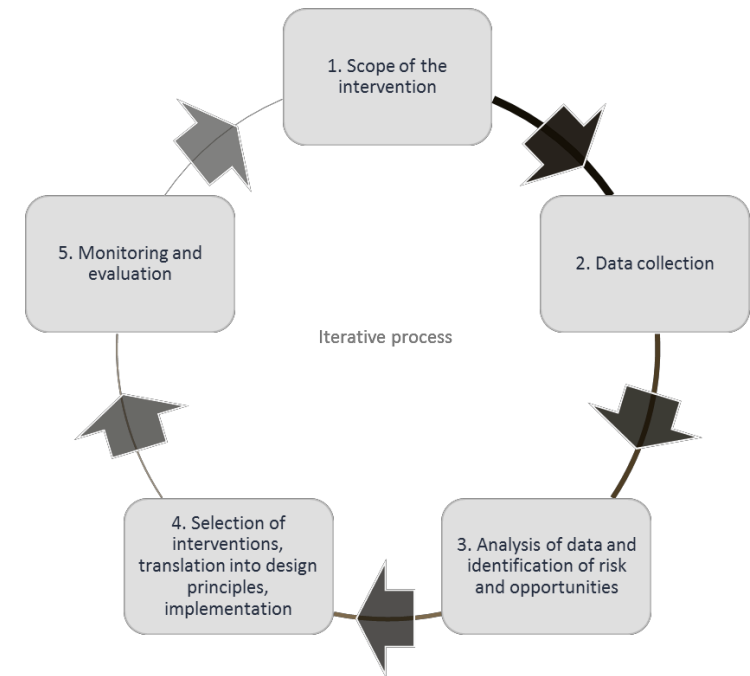
## How to measure the contribution of MFFMs to natural and social capital benefits?

- Cropped habitats cannot provide all the diverse needs for biodiversity
- Syngenta advocates the use of marginal lands for habitat and food provision
- For over 15 years Syngenta facilitate systematic introduction of biodiversity features into agricultural landscapes.
- Syngenta and Arcadis have:
  - examined the implementation protocols of MFFM,
  - carried out wide-ranging discussions and interviews with various stakeholders
  - reviewed the extensive scientific literature available.
- The project resulted in:
  - better definition of the design principles that guide the implementation of MFFMs,
  - clear identification of the value to farmers and of the wider societal benefits,
  - better definition of the value, including monetization.



## Consulting business and conservation organizations seeking feedback

- A number of challenging questions remain (e.g. measurement of benefits and value creation).
- We would like to establish an open and inclusive dialogue with business and conservation stakeholders to seek feedback and to answer the following questions:
  - How to perform an integrated valuation of both social and natural capital benefits?
  - How to extrapolate data and results from individual sites to landscape level?
  - How to fill data gaps?
  - How to share the natural and social capital benefits with stakeholders?
  - How can we make our assessment of the benefits of field margins more robust?
- **For more information contact** [gregor.pecnik@arcadis.com](mailto:gregor.pecnik@arcadis.com) and [romano.devivo@syngenta.com](mailto:romano.devivo@syngenta.com)



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<https://www.arcadis.com/en/global/our-perspectives/making-natural-capital-count/>



# Thank you



# World Forum on Natural Capital

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