Natural Capital Standard for Green Infrastructure

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Background
- internal drivers

Species protection   Site designation   Ecosystems

ECOSYSTEM APPROACH

Edinburgh Living Landscape

- is a new way of thinking about how we manage land in a multifunctional way to do more for wildlife, citizens and the economy

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Multiple benefits of GI - ecosystem services

Lowering air pollution

Flood alleviation and management

Health and well being

Climate change adaptation and mitigation

Quality of place

Recreation

Pollination

Improved water quality

Land and property values

Biodiversity

Food production

Education

Tourism

GI delivers multiple benefits

Edinburgh Living Landscape

- 19 projects:

- Work with volume house builder to showcase exemplar high quality and wildlife rich landscapes in new development

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Policy drivers
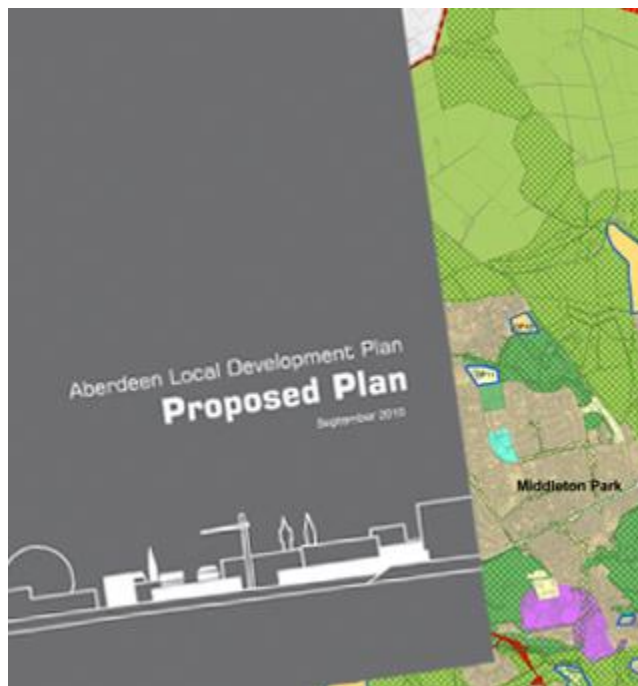
Natural capital standard for green infrastructure

- a evaluation tool
to assesses the quality of GI

grabs

green and blue space
adaptation for urban areas and eco towns

European Union

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Partners

TCPA
University of Manchester
London Borough of Sutton
NWDA
Southampton City Council
Provincial Government of Styria
Municipality of Kalamaria

KU CORPI
The Amsterdam City District of Nieuw-West
Regional Environment Centre for Eastern Europe (Slovakia)
Etnambiente SRL
University of Catania
Province of Genoa
City of Malmö

Welcome to the GRaBS Project website

http://www.grabs-eu.org/

An evaluation tool

$$\text{GI ratio} = \frac{\textit{Total area of green and blue infrastructure}}{\textit{Total development surface area}}$$

An evaluation tool

GI ratio =

$$\frac{\sum ((Area\ a \times weighting\ factor) + (Area\ b \times weighting\ factor) + etc)}{\sum (Area\ a + Area\ b + etc)}$$

Weighting factor
- ecosystem services

Sealed surface = 0

Permeable paving = 0.3

Green roof = 0.7

Amenity grassland = 0.4

Naturalised grassland = 0.6

Herbaceous border = 0.6

SUDS with biodiversity features = 1

SUDS with low biodiversity value = 0.5

Planted native tree or shrub = 0.6

Stand of trees (retained or planted) = 1

Retained hedgerow = 1

Planted native hedgerow = 0.6 - 0.8

Community growing area/allotment = 1
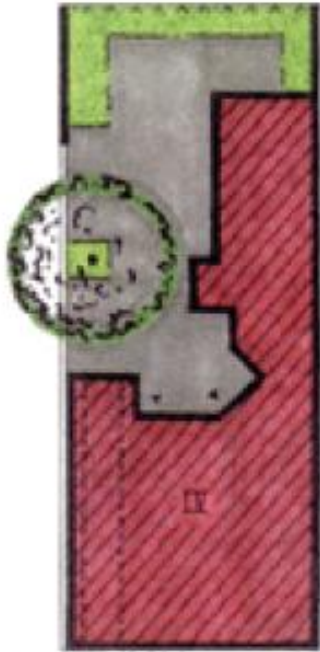
Raised bed planters = 0.6

Naturalised play area = 0.8

Surface	Ecosystem service								
	Recreation	Aesthetics	Biodiversity	Pollination	C store	Flood regulation	Sense of place	Air quality	Local climate regulation
Amenity grassland	++	+	+	+	++	+	+		
Wildflower meadow		+++	+++	+++	++	++	+++		
Permeable paving		+				++			
Retained mature trees		+++	++++	+++	++++	++++	++++	+++	+++

Flexibility is a key component

Current situation
BAF = 0.06
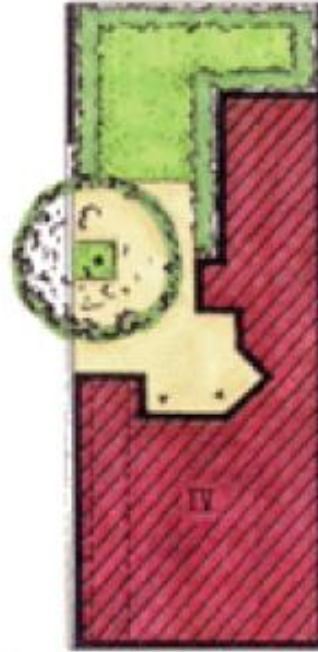
Planning variant A
BAF = 0.3
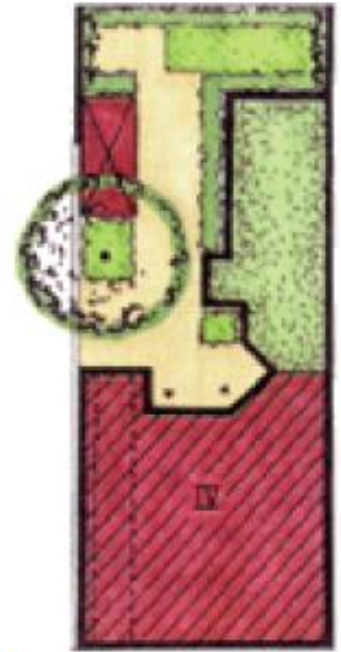
Planning variant B
BAF = 0.3

Land area = 479 m²; degree of development = 0.59

Ecosystem services

- Carbon sequestration
- Aesthetics
- Pollination
- Water quality
- Air quality
- Slowing water movement
- Biodiversity
- Health and well being
- Recreation

Context

Evidence base

Environmental maps

- Air temperature
- Surface water movement
- Greenspace
- Green network
- Ecosystem services opportunity mapping

Examples of GI ratio in development

Berlin

- New development = 0.6
- Commercial = 0.3
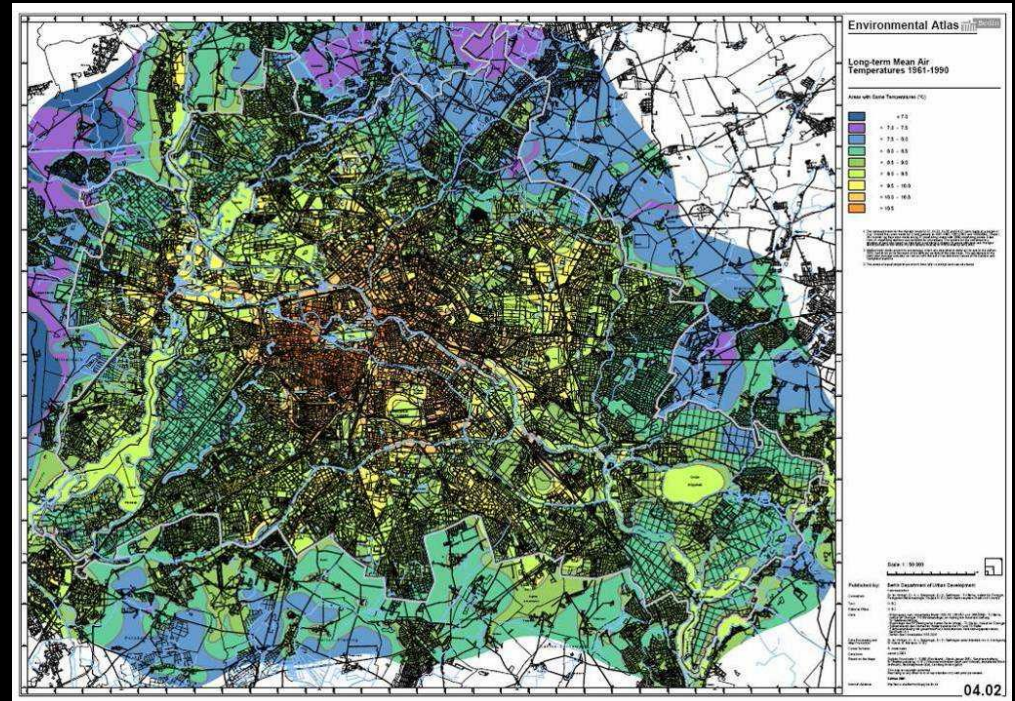- Public facilities = 0.6
- Nursery school and daycare centre = 0.6
- Secondary school = 0.3

A worked example

HEDGE PLANTING

WOODLAND PLANTING

GROUNDCOVER PLANTING

ENTRANCE, LIBRARY PLANTING AND BRUNTSFIELD HOUSE GARDEN

Groundcover Area 1

Woodland seed mix (approx 1100m2)
In areas of low usage
Exact location to be established on site with LA

Groundcover
Area 4

Groundcover
Area 2

Groundcover
Area 10

BED 04
BED 01
BED 02
BED 03
BED 05

Hedge 08
Hedge 09
Hedge 02
Hedge 01
Woodland 1

Hedge 04
Hedge 05
Hedge 06
Hedge 07

Woodland 2

Groundcover
Area 5

Hedgerow seed mix (400m2)
In areas of low usage
Exact location to be established on site with LA

Groundcover
Area 3

BED 14
BED 15
BED 16

Climbers 4
Climbers 3
Climbers 2
Climbers 1

P Avi
+ Area 7

BED 10
BED 07
BED 08
BED 11
BED 09
BED 12 BED 13

Surface type	Area (m2)	Factor	Area x factor
Sealed areas (e.g. tarmac, concrete, building roofs)	11802	0	0
Partially sealed areas (e.g. setts, paving stones)	188	0.2	37.6
Solar panels on roof		1	
Permeable paving / gravel	8560	0.3	2568
Green roof	1550	0.7	1085
Vertical greening	61.5	0.5	30.75
Amenity grassland	0	0.4	0
Amenity grassland with bulbs / naturalised grassland (e.g. relaxed mowing, native species)	3710.5	0.6	2226.3
Planted wildflower meadow	430	0.8	344
Retained species rich grassland / meadow		1	
Flower / shrub bed	512	0.6	307.2
SuDS with biodiversity features	0	1	0
SuDS with low biodiversity value	0	0.5	0
Water feature - naturalised, with high biodiversity value	0	1	0
Water feature with low biodiversity value	0	0.5	0
Stand of 10+ trees / woodland (retained or planted)	2600	1	2600
Planted non-native tree girth <15 cm (default 5 m2 per tree)	0	0.4	0
Planted non native tree girth >15 cm (default 10 m2 per tree)	50	0.4	20
Planted native tree (girth <15 cm) (default 5 m2 per tree)	0	0.6	0
Planted native tree (girth >15 cm) (default 10 m2 per tree)	810	0.6	486
Retained native tree (default 20 m2 per tree)	340	1	340
Retained non-native tree (default 20 m2 per tree)	500	0.6	300
Retained hedgerow (based on actual approx width)	0	1	0
Planted non-native hedgerow (default 1 m width)	102.5	0.4	41
Planted native hedgerow (1 -2 species) (default 1 m width)	61	0.6	36.6
Planted native hedgerow (3+ native species) (default 1 m width)	0	0.8	0
Community growing area/allotment		1	0
Raised bed planters	0	0.6	0
Naturalised play area	0	0.8	0
Total development area	27850		
Total of areas x factors	10422.45		
Green infrastructure factor	0.374235189		

Bonus features

- Planted wildflower meadow
- Retained species-rich grassland / meadow
- SuDS with biodiversity features
- Water feature - naturalised, with high biodiversity value
- Stand of 10+ trees / woodland (retained or planted)
- Planted native tree (girth <15 cm)
- Planted native tree (girth >15 cm)
- Retained native tree
- Retained hedgerow
- Planted native hedgerow (3+ native species)

James Gillespie's High School

GI ratio = 0.37
GI ratio = 0.52 (with bonus)

Applications

- Improving GI and biodiversity in new build housing, schools, retail and business parks
- Baseline *vs* development analysis
- Retrofitting
- Climate change adaptation analysis (e.g. surface water movement, urban heat island)
- Analysing ecosystem service value of existing places
- Improving air quality

Thank you

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