the River Restoration Centre

Working to restore and enhance our rivers

Delivering River Restoration: Recipes for Success

13TH ANNUAL NETWORK CONFERENCE

Restoring Europe's Rivers

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ASSESSING LONDON'S RIVERS

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The Urban River Survey

Queen Mary University of London

Development:

The Urban River Survey (URS) is a modification of the Environment Agency's River Habitat Survey. It was developed as part of the PhD thesis of Dr Angela Boitsidis (nee Davenport) (University of Birmingham 2001) under the supervision of Angela Gurnell.

In 2003 the URS method and manual were modified by Angela Boitsidis and Angela Gurnell as part of the EU-funded SMURF project (LIFE02 ENV/UK/000144).

The present (2011) version of the URS includes many modifications by Lucy Shuker and Angela Gurnell and is described in a completely revised manual.

The URS web tool (www.urbanriversurvey.org) has been developed in collaboration with Untyped Ltd.

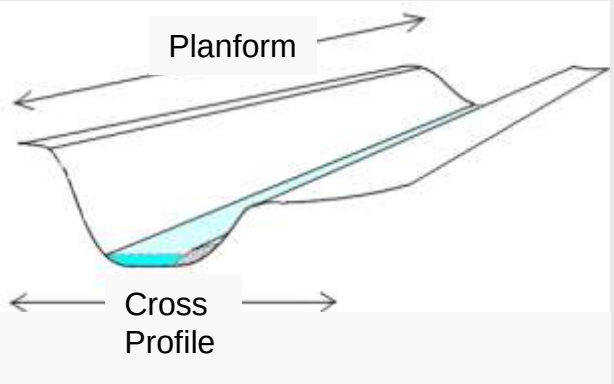
What is the Urban River Survey?

- a scientific assessment method and suite of tools that supports the work of river managers in urban environments.
- Indices calculated from survey data are used to assess the *relative* physical quality of individual surveyed stretches within the range achievable in an urban environment.
- The URS does not evaluate chemical or biological quality.
- It does assess the quality of the physical structure of riparian and aquatic vegetation.

What is the Urban River Survey?

- Modification of the RHS
- Applied to 500 m stretches of a single engineering type

Planform	Cross-Profile	Level of Reinforcement
Engineered Straight	Enlarged	None
Engineered Sinuous	Two-stage	Bed only
Recovering	Resectioned	One bank
Semi-natural	Cleaned	Bed and one bank
	Restored	Both banks
	Semi-natural	Full



- Provides a rapid field assessment
  - Qualitative data (10 spot checks + sweep up)
  - Quantitative data (counts and percentages)
  - Urban pressures (reinforcement and pollution indicators)

Planform:

Semi-natural

Engineered-sinuous

Engineered-straight

Recovering

Cross profile:

Semi-natural (recovered)

Restored

Resectioned

Enlarged (deepened / widened)

Level of reinforcement:

One Bank

Both Banks

Fully Reinforced

URS Surveys Completed

2000-2006
R. Tame (UK)
106 stretches
R. Emscher (Germany)
19 stretches
R.Botic (Czech Republic)
18 stretches

2009-2012
6 Thames tributaries
98 stretches

URS Surveys → 50 URS Indices

MATERIALS INDICES	PHYSICAL HABITAT FEATURE INDICES	VEGETATION STRUCTURE INDICES
Bed Sediment Calibre	Dominant Flow Types	Bank Vegetation Structure
Proportion Immobile Substrate	Number of Flow Types	Average Channel Vegetation Cover
Dominant Channel Substrate Type	Proportion of Pools	Count of Channel Vegetation Type
Bank Sediment Calibre Index	Proportion of Marginal (connected) Deadwater	Dominant Channel Vegetation Type
Proportion Immobile Bank Materials	Proportion of Glides	Count of Tree Features
Dominant Bank Material Type	Proportion of Riffles	Extent of Channel Shading
Dominant Bank Material Protection Type	Proportion of Runs	Complexity Bank Face Structure
Bank Protection I	Proportion of Ponds	Complexity Bank Top Structure
Dominant Bank Protection Category	Proportion of stagnant (disconnected) Standing Water	Complexity Tree Cover
Number of Bank Protection Types	Count of Vegetated Side Bars	
Proportion Biodegradable Bank Protection	Count of Unvegetated Side Bars	
Proportion Open Matrix Bank Protection	Count of Sand / Silt Deposits	
Proportion Solid Bank Protection	Count of Mid-channel Bars (veg & unvegetated)	
Proportion No Bank Protection	Count of Point Bars (veg & unvegetated)	**URBAN PRESSURE INDICES**
	Count of Habitat Types	Count of Pollution Types
	Dominant Natural Bank Profile Type	Count of Special Feature Occurrence
	Count of Natural Bank Profile Types	Count of Nuisance Species
	Proportion Natural Bank Profile	Extent of Nuisance Species
	Dominant Artificial Bank Profile Type	Number of Input Pipes
	Count of Artificial Bank Profile Types	Number of Leach Points
	Proportion Artificial Bank Profile	

URS Indices → 3 URS Classifications

Materials Indices

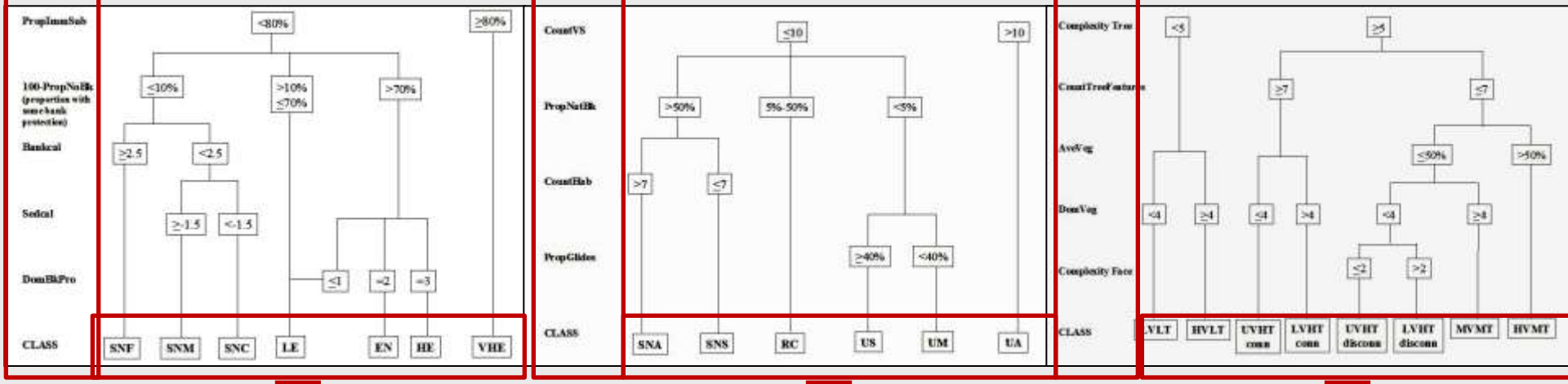
Substrate mobility
Substrate calibre
Reinforcement materials

Physical Habitat Indices

Natural bank profiles
Habitat types
Habitat richness

Vegetation Indices

Tree features
In-channel vegetation cover and type
Bank vegetation complexity

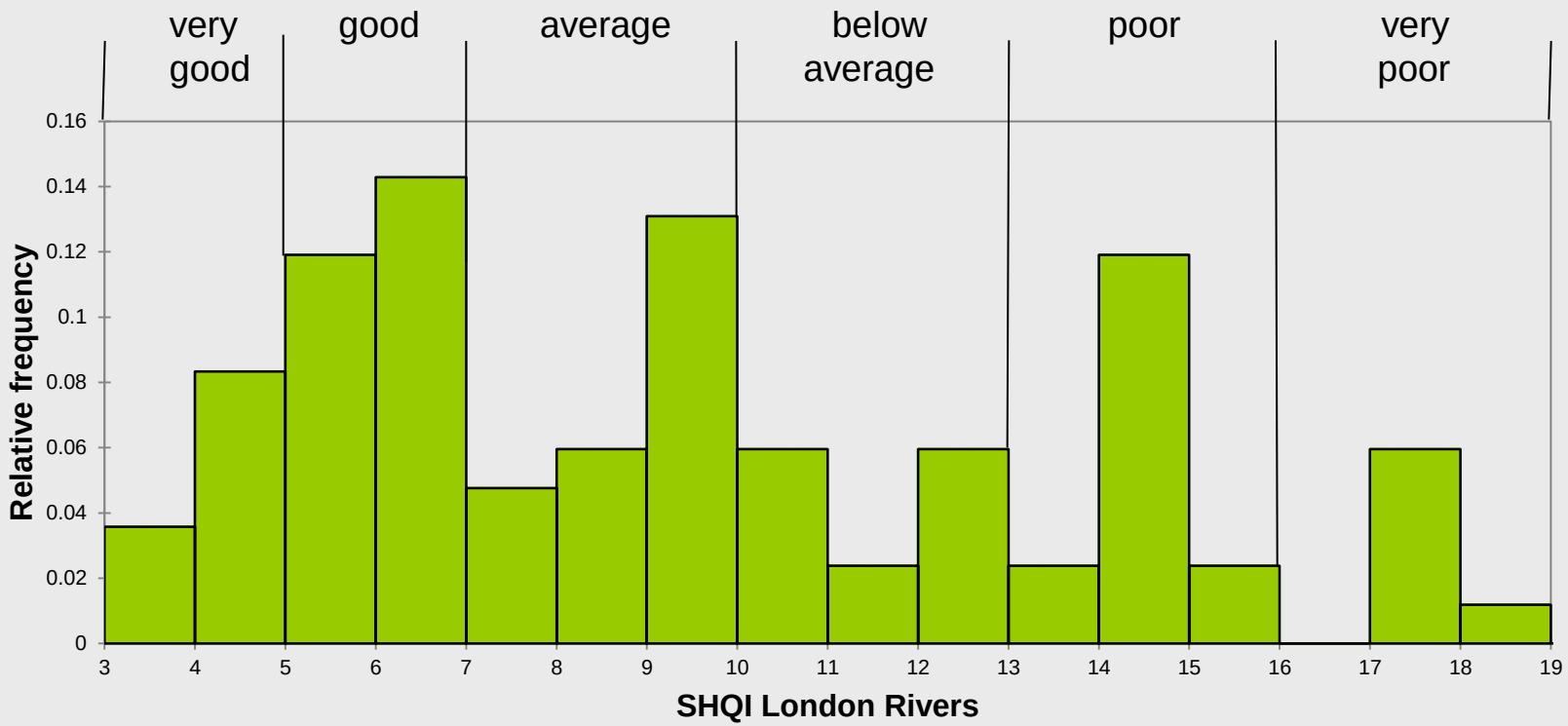


7 Materials Classes

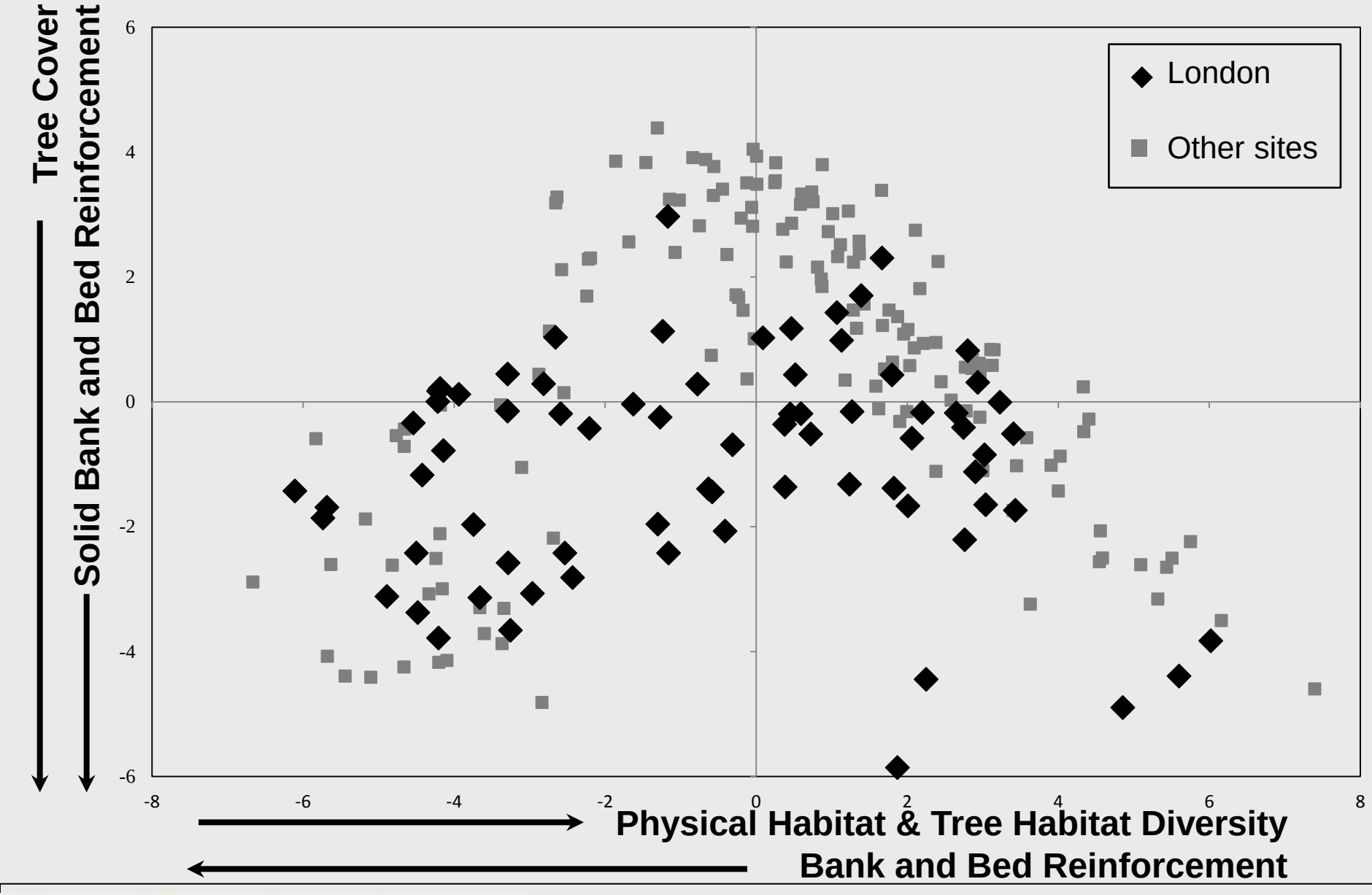
6 Physical Habitat Classes

8 Vegetation Classes

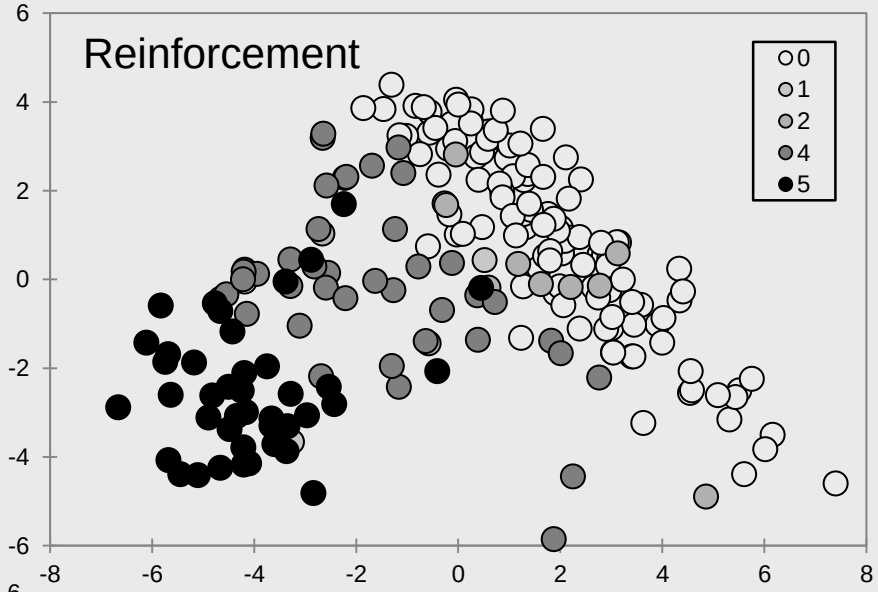
3 URS Classifications → 1 Stretch Habitat Quality Index

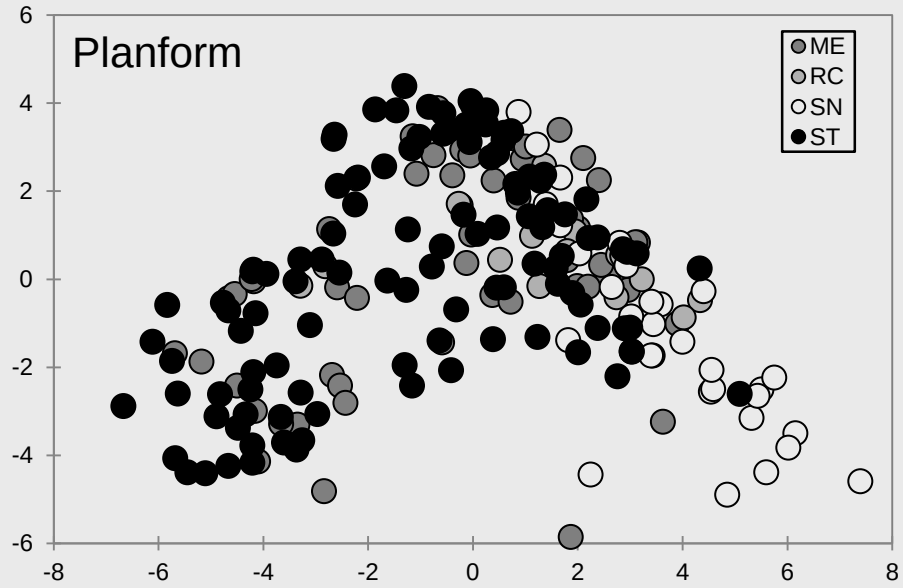


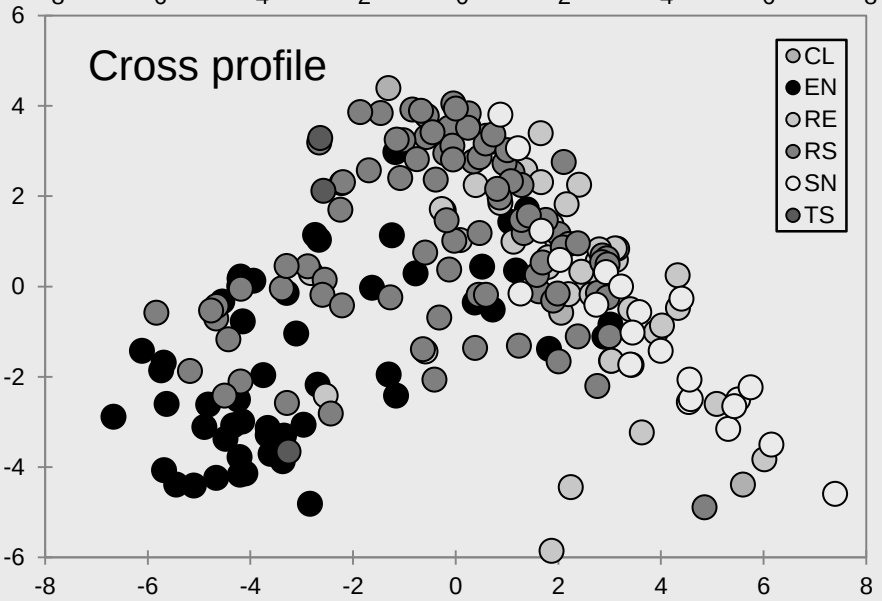
50 URS Indices → PCA



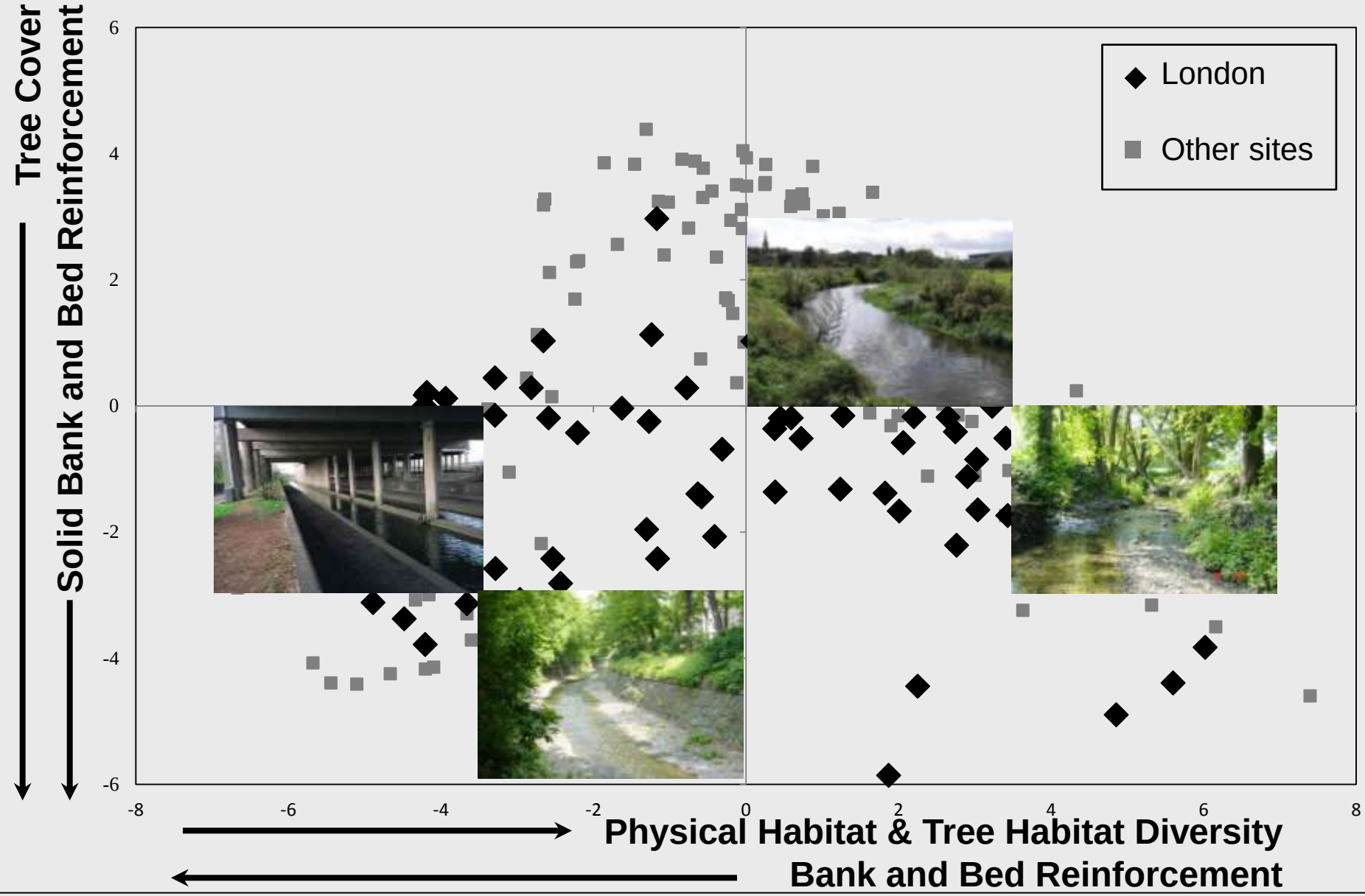
Engineering types are spatially structured in the PCA plot



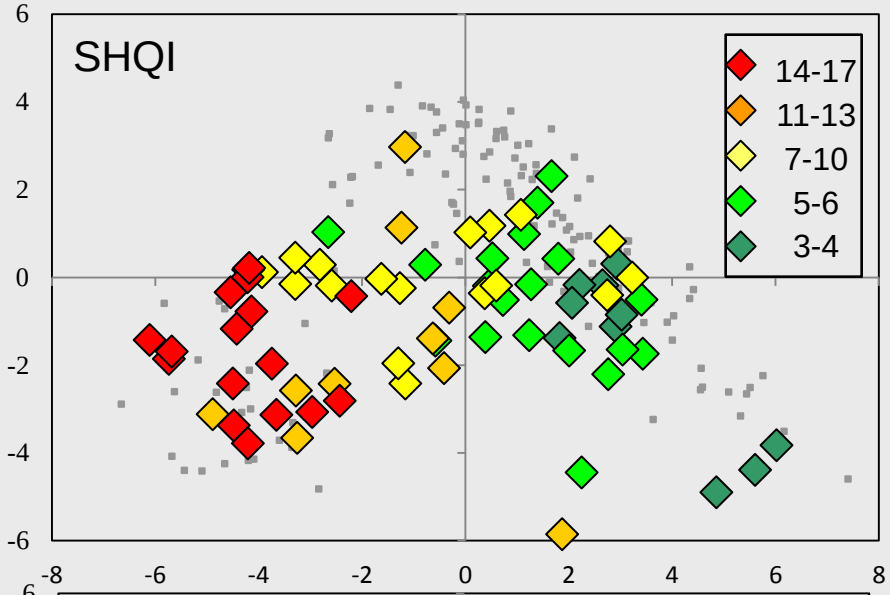


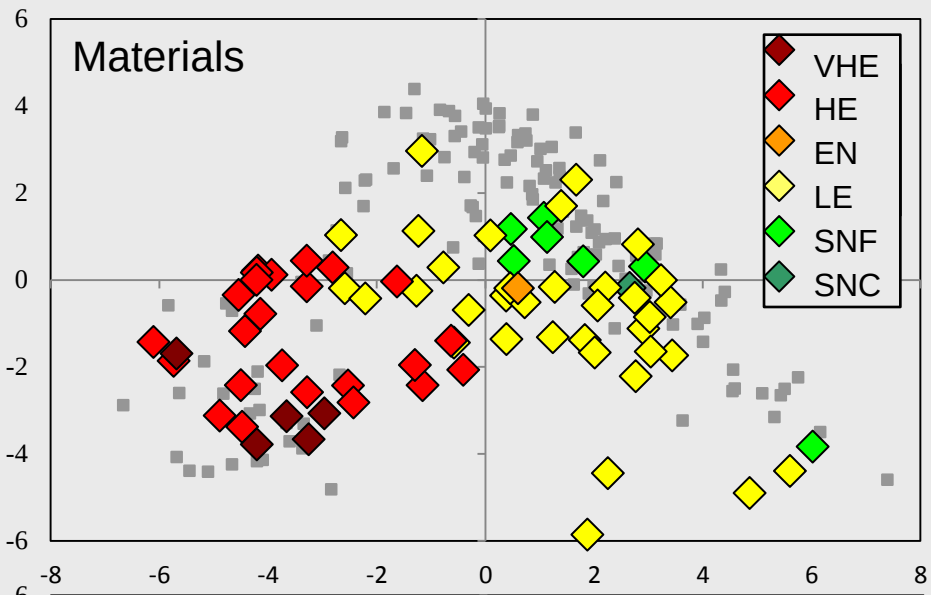


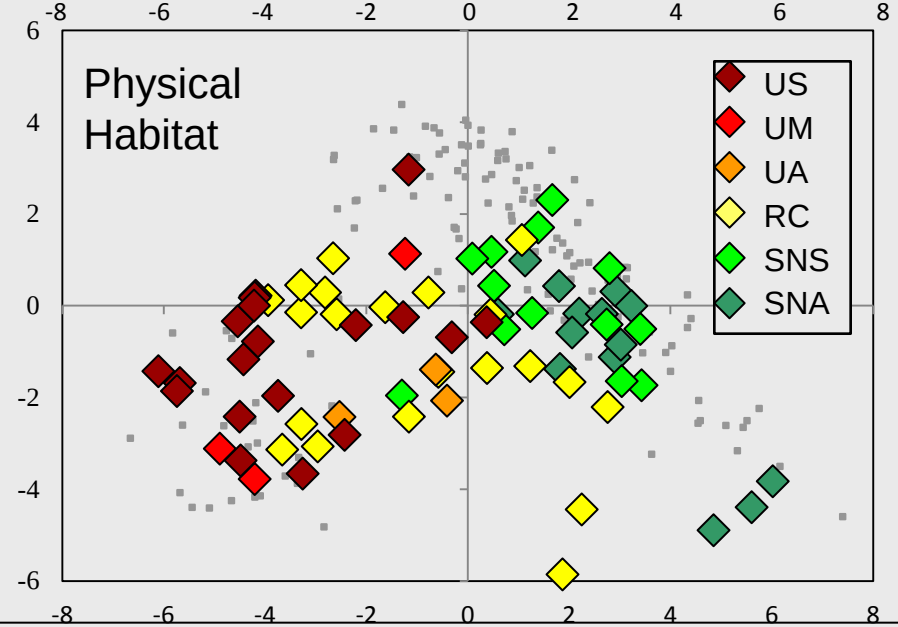
Stretches of different engineering type are discriminated

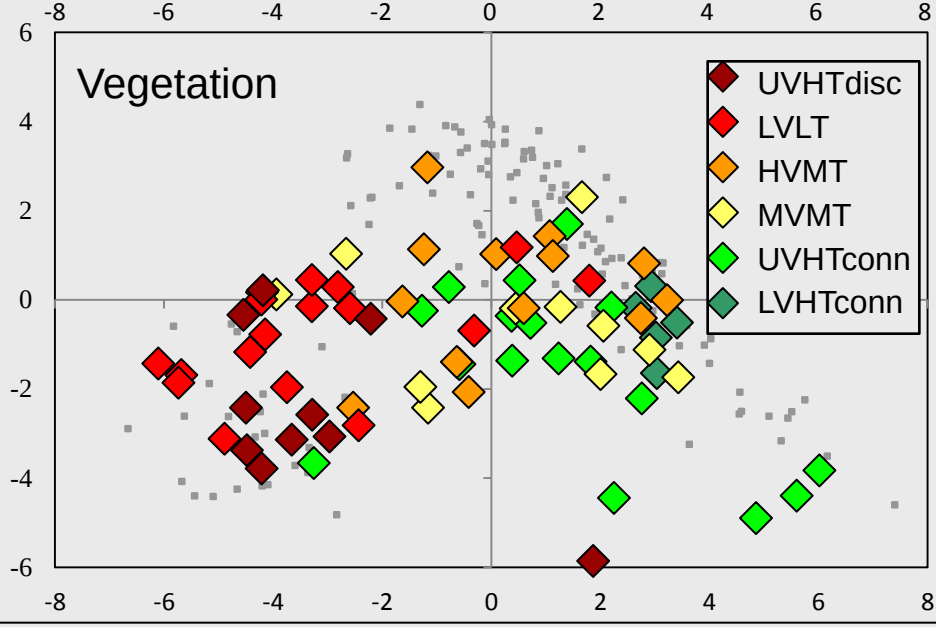


4 Classifications are spatially structured in the PCA plot

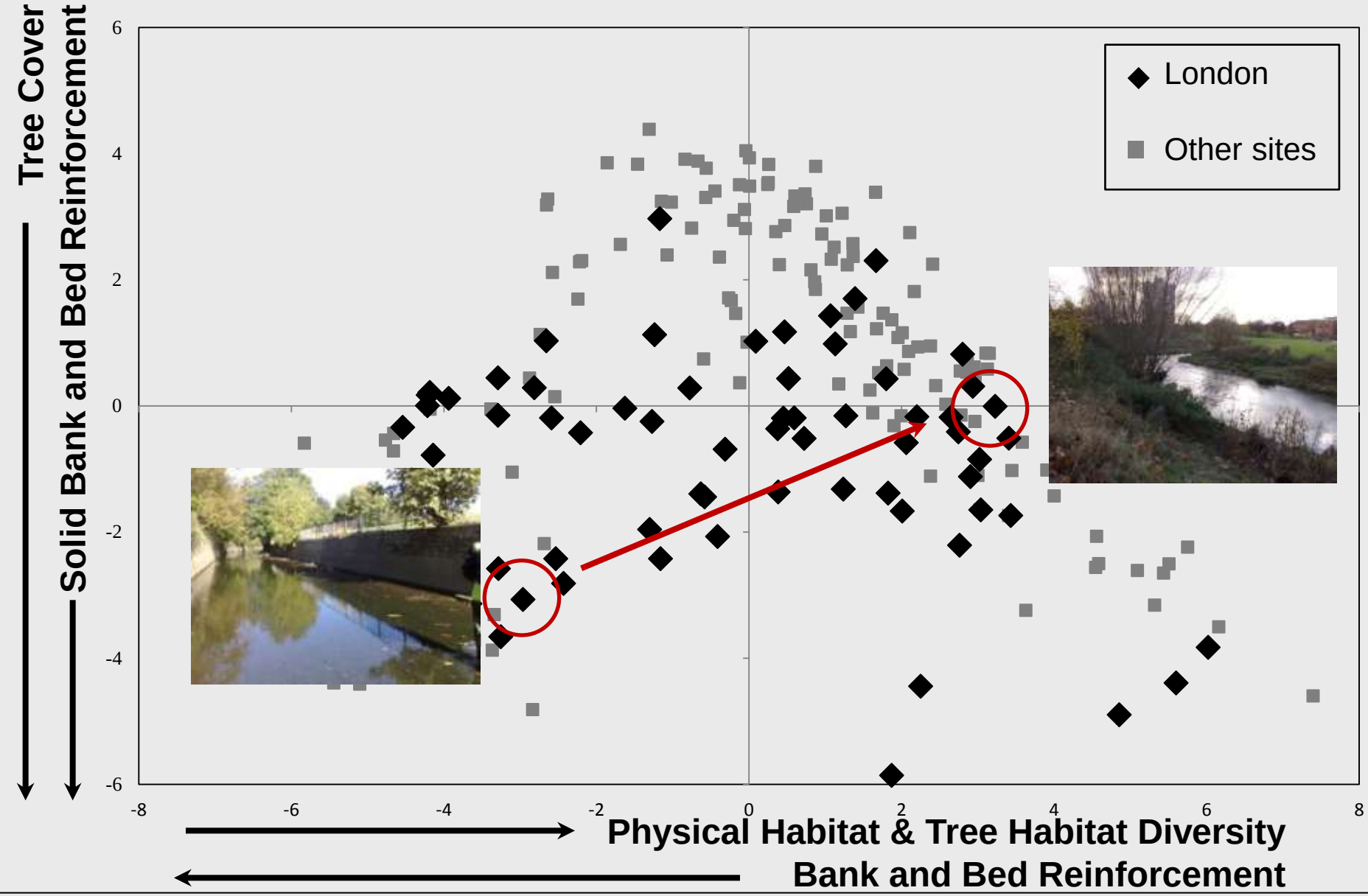








The impact of restoration can be tracked



On-line information system: www.urbanriversurvey.org

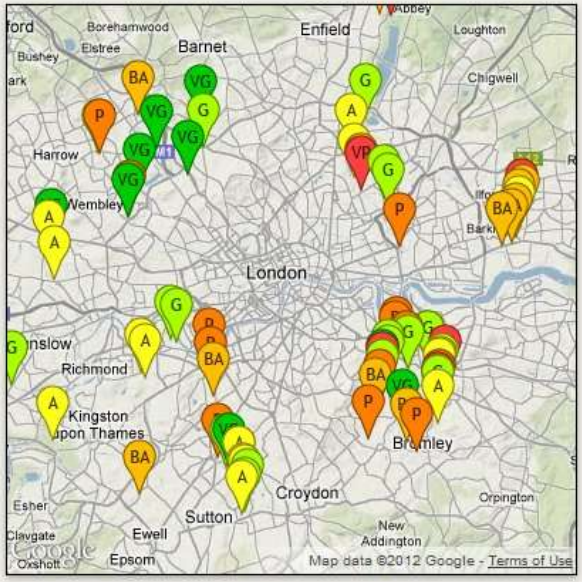
The Urban River Survey BETA

Home Map Documents Log in

Rivers in Urban Environments

More than 50% of the world's human population lives in cities. For these people, rivers are a source of drinking water, sanitation and transport, as well as providing crucial open space and opportunities for relaxation and recreation. At the same time as providing these services to humans, river corridors are the most biodiverse ecosystems on earth and in cities provide a particularly important resource for wild life.

Many of these uses are in conflict and centuries of urban and industrial development have led to severe river degradation, seriously threatening the ability of rivers to deliver all of these services. River management agencies are faced with balancing all of these pressures, making optimal decisions about river improvements, and restoring rivers to a healthier state.



The Urban River Survey

The Urban River Survey is **a scientific assessment method and suite of tools that supports the work of river managers in urban environments**. The survey, which is a development of the Environment Agency's *River Habitat Survey*, records information on the physical structure of 500m stretches of urban rivers and their margins.

Indices calculated from survey data are used to **assess the *relative* physical quality of individual surveyed stretches within the range achievable in an urban environment**.

The Urban River Survey **does not evaluate chemical or biological quality**. It does assess the quality of the physical structure of riparian and aquatic vegetation.

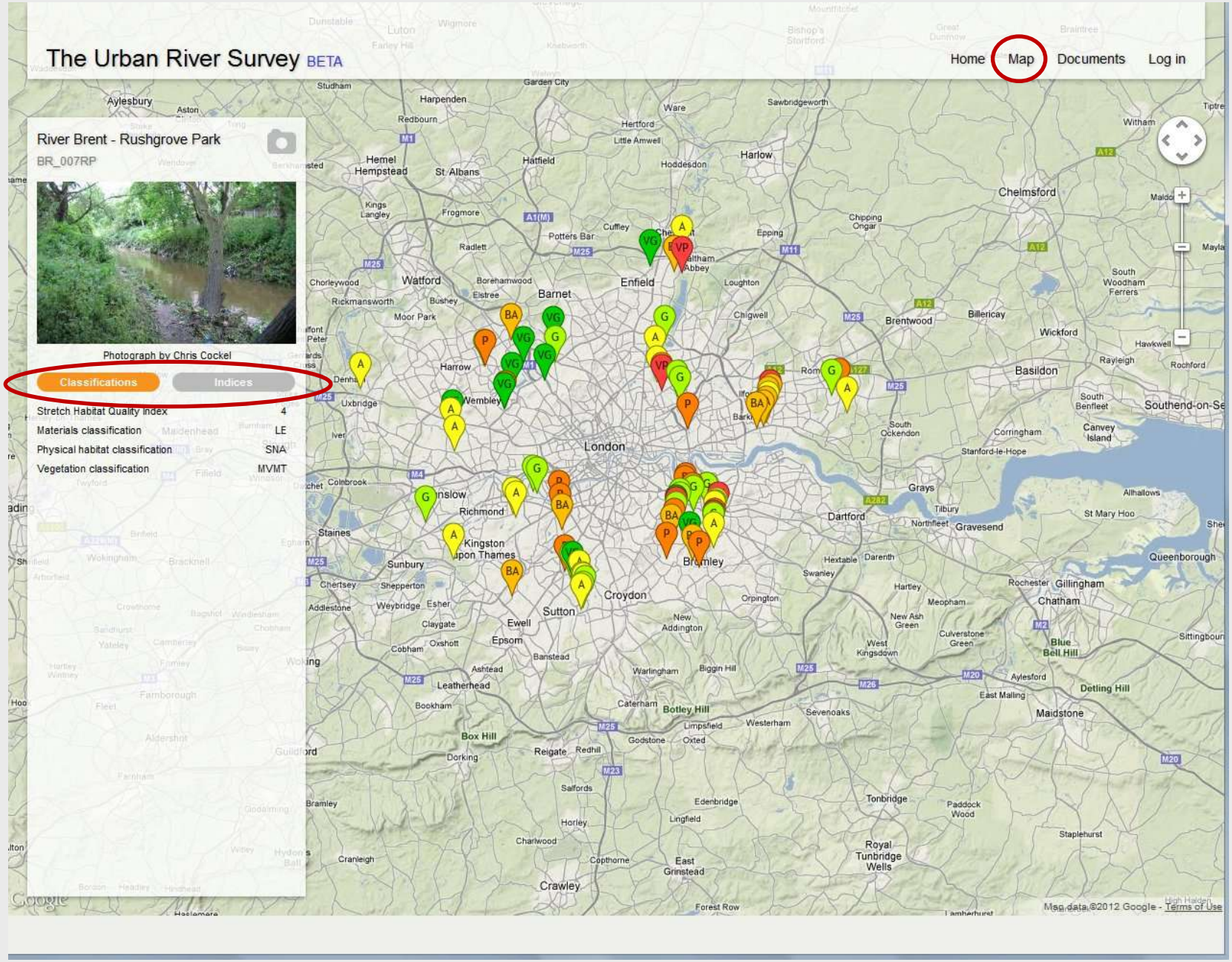
This web site is the centre for managing and communicating Urban River Survey data. It provides: maps, charts and photographs for querying the URS database, forms for entering and checking field data, and training material explaining how to implement the URS.

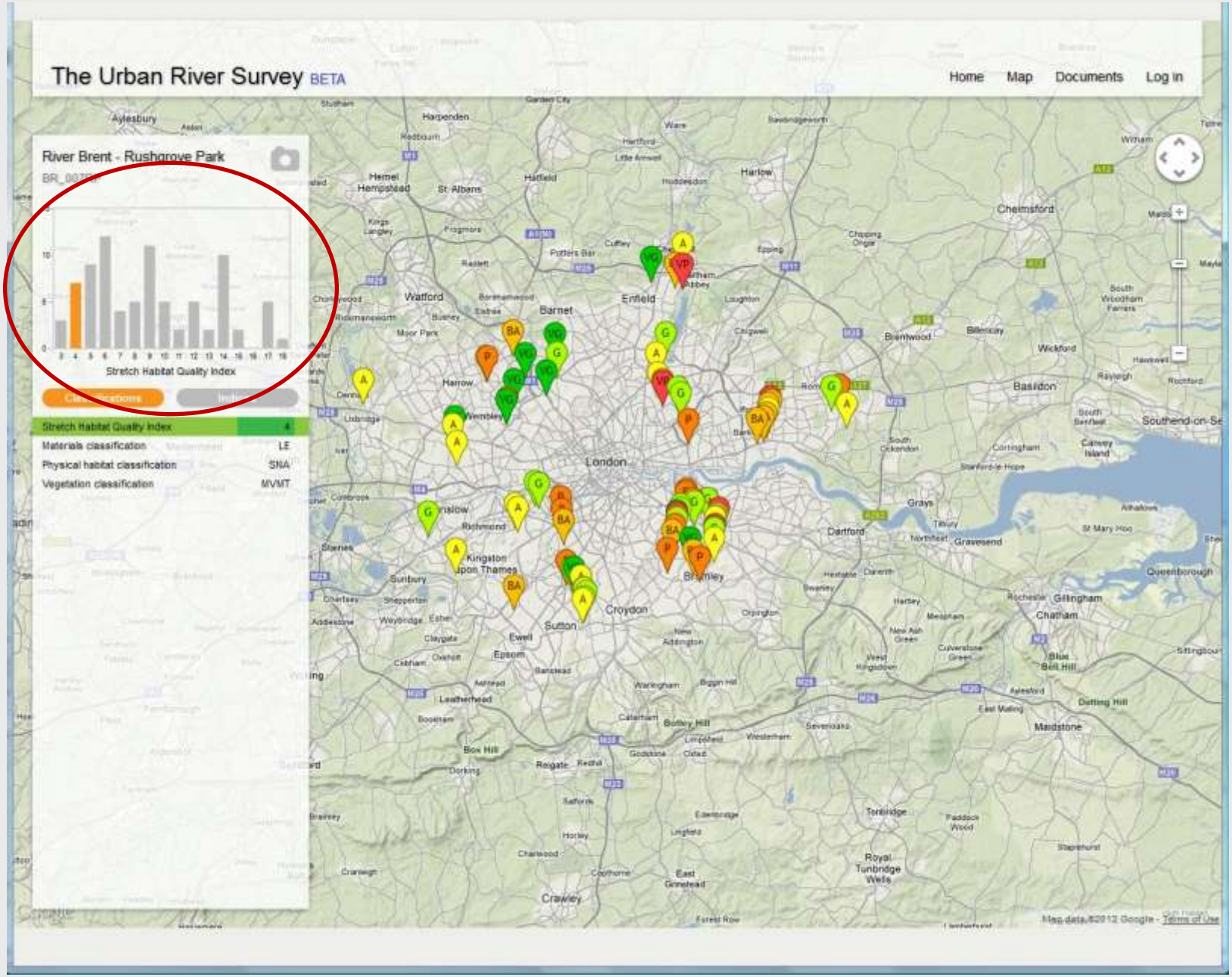
The Urban River Survey is the product of 10 years of research by Angela Gurnell in collaboration with Angela Boitsidis, Lucy Shuker, and May Lee, conducted at Queen Mary, University of London, King's College London, and the University of Birmingham, and funded by the Natural Environment Research Council, Natural England, and the European Commission.

Unless otherwise stated, photographs supplied by Lucy Shuker, Angela Gurnell and Chris Cockel.

Queen Mary University of London

- Documents: Manual, survey sheets, description of indices, description of classifications
- Map: visualisation of surveyed stretches according to their SHQI
- Display: indices and classes for individual stretches and histograms that place each stretch into the context of all other surveyed stretches
- Log-in: for on-line data entry and retrieval / download


The Urban River Survey BETA
Home
Map
Documents
Log in
River Brent - Rushgrove Park
BR_007RP
Photograph by Chris Cockel
Classifications
Indices
Stretch Habitat Quality Index 4
Materials classification LE
Physical habitat classification SNA
Vegetation classification MVMT
London
Map data ©2012 Google - Terms of Use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London
Watford
Barnet
Enfield
Harrow
Wembley
Kingston upon Thames
Croydon
Sutton
Epsom
Ewell
Dartford
Gravesend
Basildon
Chelmsford
Harlow
Hatfield
St Albans
Hemel Hempstead
Harpenden
Aylesbury
Crawley
Reigate
Maidstone
Tonbridge
Royal Tunbridge Wells
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Acknowledgements:

The Environment Agency for their collaboration and for permission to reproduce and use diagrams from the River Habitat Survey in Britain and Ireland, Field Survey Guidance Manual, 2003 version.

Natural England and Queen Mary, University of London for funding development of the URS website and a series of training workshops.

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Dave Webb (Environment Agency)