

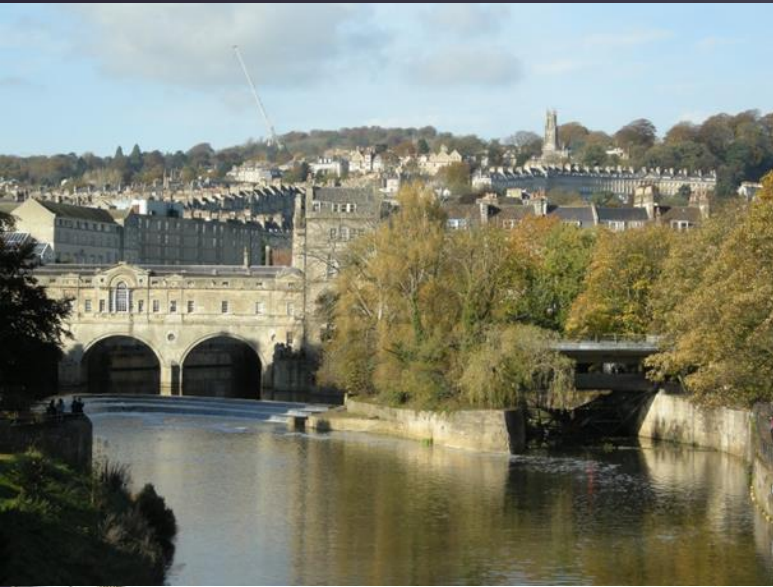
Developing Guidance to Balance the Needs of Bats and Development in a Landscape City

1. The Context

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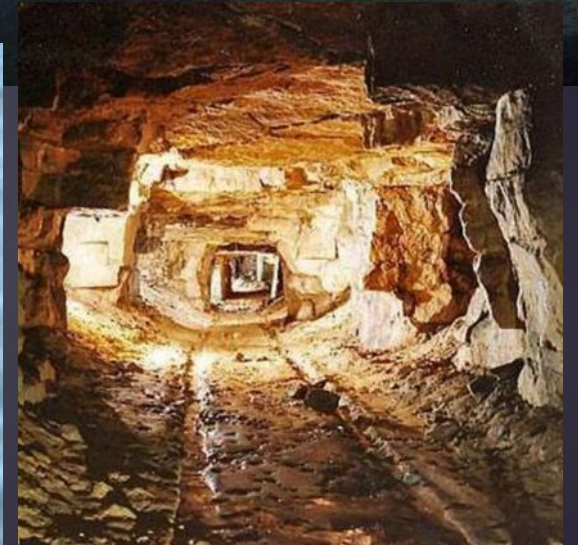
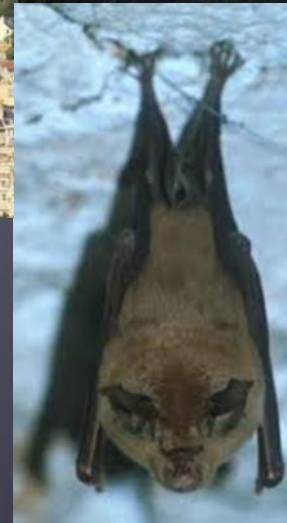
World Heritage City

The green setting of the City in a hollow in the hills



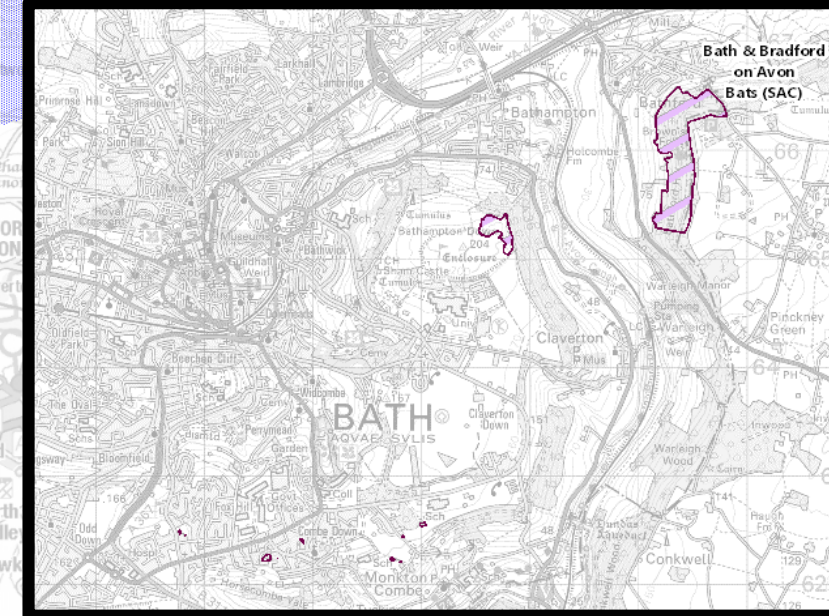
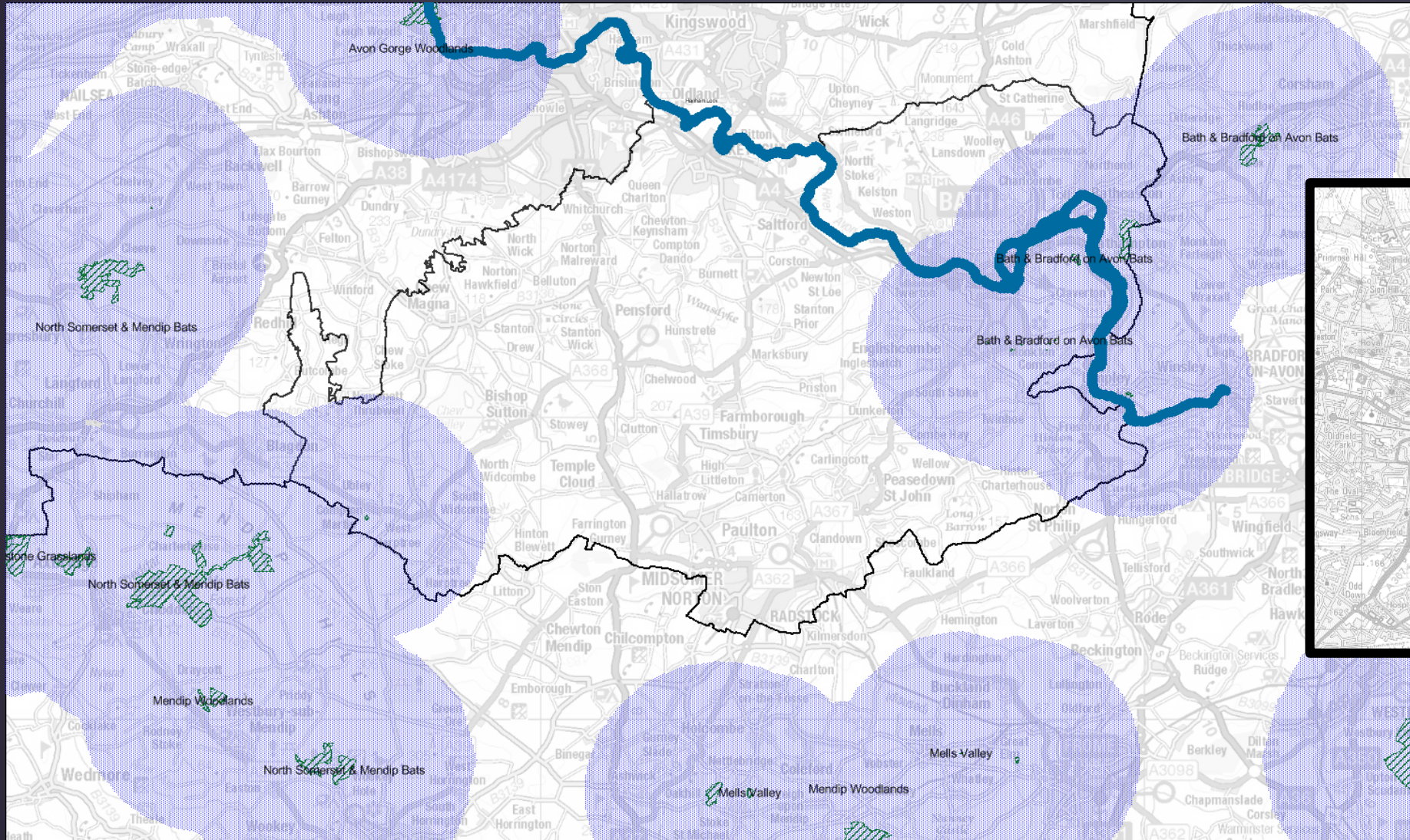
The habitat connections within, through and beyond the city are significant

Bath & Bradford on Avon Bat SAC



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Landscape scale conservation of biodiversity Key

New Development will protect and enhance international, national and local sites and existing networks of valued habitats; facilitate migration and dispersal through the natural and built environment; and seek to reduce fragmentation of existing habitats

Habitat Regulations

Un-evidenced belief that the river corridor provides important supporting habitat for the SAC

Pressures for development

River Avon through Bath forgotten / neglected for 30+ years then designated as an Enterprise Zone – ripe for development

2. The Problem – a difficult place

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Shared Position Statement

Darkness, habitat connectivity & new riverside development- a feasible combination?



Difficult meetings

2. The Problem – Where we were

- Special situation in Bath - SAC – gut feeling that river was key habitat for SAC
- Policy commitment to deliver landscape scale conservation
- Significant pressures and policy commitment for new riverside development
- Significant ‘unknown’ risks of increased light levels and habitat loss along the river corridor
- Each development subject to negotiation/debate/argument about relevance of bats and SAC issues – no consistent approach
- Informal Position Statement with lux levels not evidence based
- Opportunity for collaborative approach to bring clarity & certainty to planning system
- Low budget – reliance on goodwill

2. The Problem - Where we wanted to be

- **Able to fulfil Legal Duties & Policy Commitments - BaNES and Developer**

Bath Bats SAC, River Avon SNCI, European Protected Species, Landscape Scale Biodiversity Conservation, Enterprise Zone allocations

- **Have Clarity in the Planning Process (including lux levels!)**

Clear understanding of ecological constraints at outset for all parties.

Consistency and fairness.

Standardised approach to assessment, survey requirements and mitigation

- **Sound knowledge and robust evidence**

Importance of the River Corridor to integrity of SAC to be better known and understood

ALSO – finer scale understanding – time of year, time of day/night, role of habitat features, spatial differences, foraging vs. commuting – to be better understood

Measures to monitor and manage lighting to be better understood.

- **Able to protect and enhance the habitat functions of the river corridor**

2. The Problem – Our plan

- To study the river corridor to determine its use by bats (HBs) and establish its importance to the SAC
- To understand how bats use the river corridor – what are key factors and timing
- Use evidence to help develop guidance (if needed) for maintaining and expanding a dark vegetated corridor along the river – functional corridor
- Provide approach that if followed would avoid the need for river corridor bat surveys and remove risk of affecting integrity of SAC
- To develop an planning approach applicable elsewhere where appropriate
- To work with experts as a team, not customers/client
- Intended outcomes: 1) continued / increasing use of river by horseshoes bats (& other wildlife) and 2) a more streamlined & less costly planning process for water side developments

3. The Research

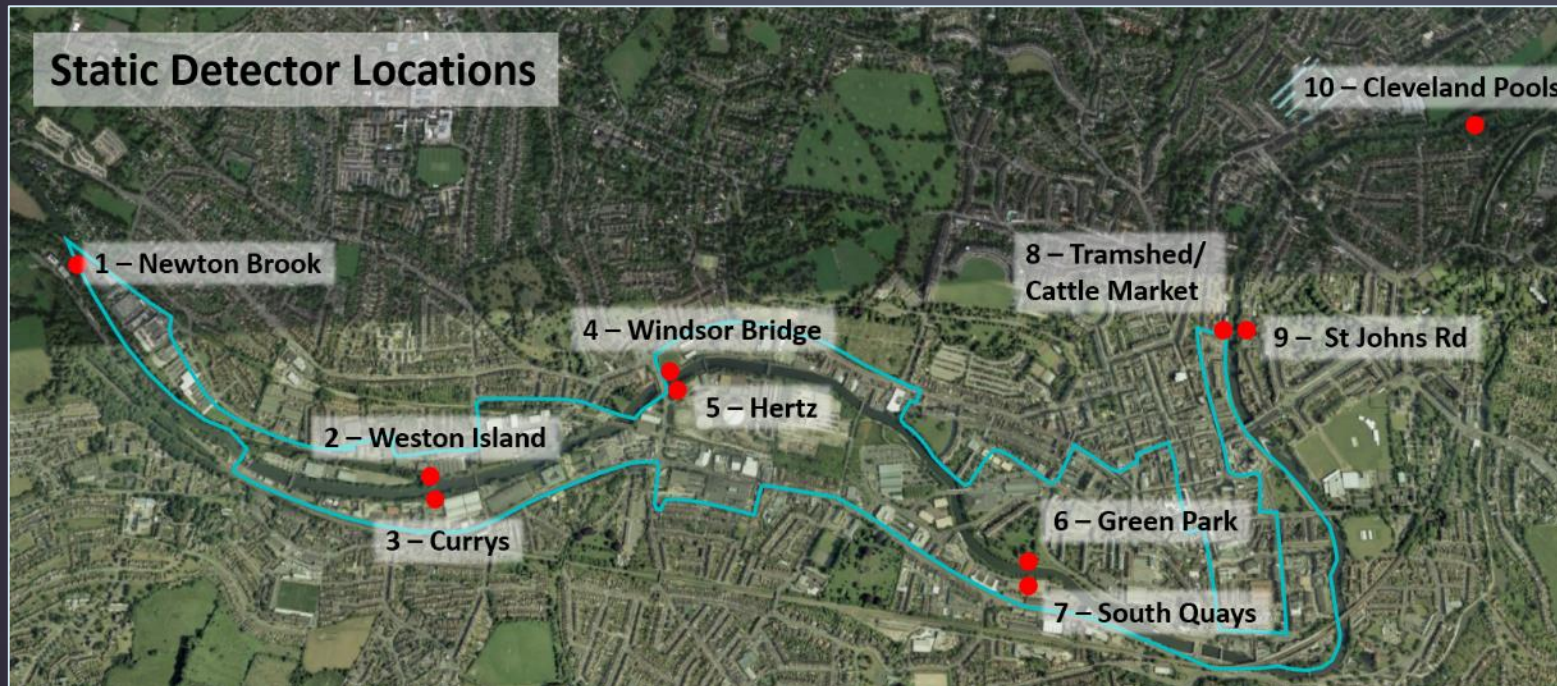
- **Static Detectors**

10 locations. Full length of corridor. Mix of habitats.

5-7nights/month for 12 months.

Pros: Record all night. Measure 'intensity' of activity. More species. Cost-efficient. Paired comparisons. Automated ID.

Cons: Blind. Cannot count bats. Cannot follow bats. Cannot observe habitat use/behaviour/weather/light changes.



3. The Research

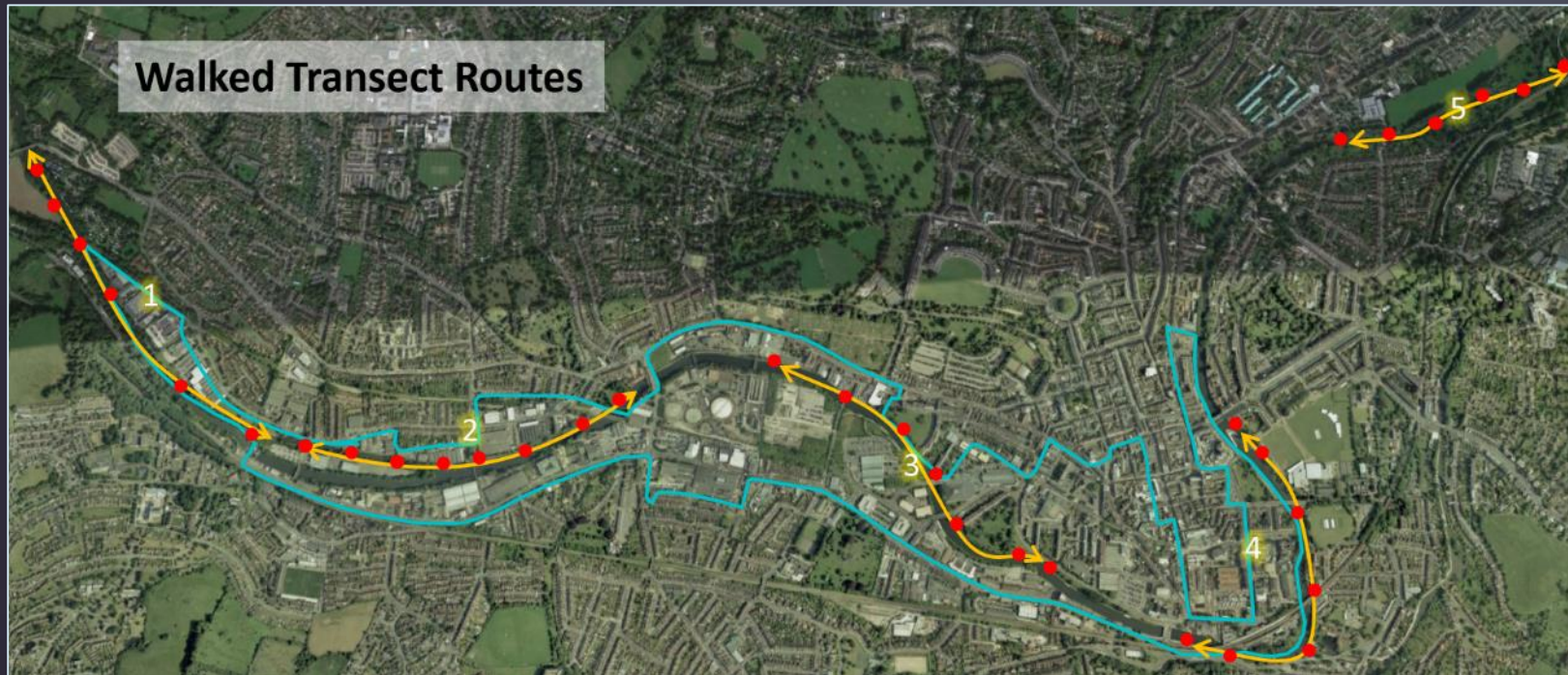
- **Walked Transects**

5 locations along towpath. Full length of corridor. Listening points en route.

A 3hr survey each month April – October.

Pros: *Allows observation of numbers, habitat usage and behaviour. Can follow bats. Looks at connecting habitat.*

Cons: *Limited duration - snapshot. Labour intensive.*



3. The Research

• Baseline Lighting Survey

Qualified lighting engineer

79 Survey locations – NOT systematic (too much work for budget!)

Locations chosen by ecologist to represent variety of bankside habitats

Ground-level @ horizontal plane reading

4x directions on vertical plane readings

Generally very dark (<1lux) at water's edge

Regularly between 25-100lux at lit locations

Key lighting 'hotspots' identified



3. The Research

- Horseshoe Bats – where?**

Recorded at every static detector and 3/5 transects. Exploratory/ inquisitive behaviour.

Relatively low numbers, but notoriously hard to detect.

Associated with darker and vegetated areas, as well as known roosts – cattle market vaults.



3. The Research

- **Horseshoe Bats – where?**

'Green lane' features – dark and linear. Otherwise tree lines and hedgerows.

Found on darkest transects most regularly. HIGHLY light averse.

Fly low over water (<2m) and close to water's edge (<5m either side).

Lighting present beyond screening vegetation in some cases.



3. The Research

- Horseshoe Bats – when?

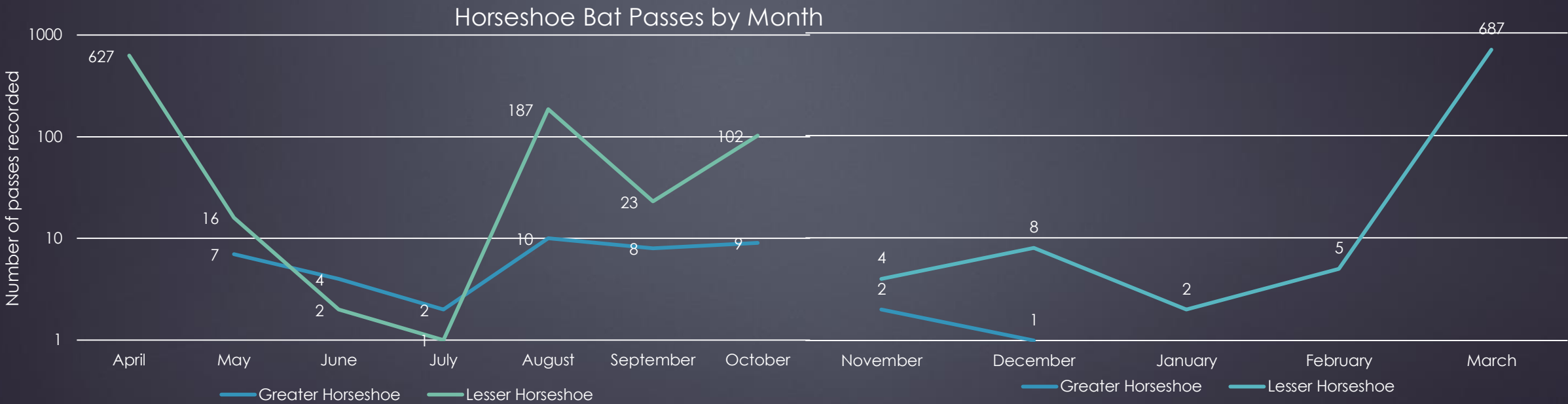
Peaks at beginning and end of the active season.

Activity even persists through winter at lower level.

Known hibernation roosts close to the city, Summer roosts further away = **transition importance**.

Navigation and foraging habitat between summer and winter roosts.

Different prey abundance in different seasons.



3. The Research

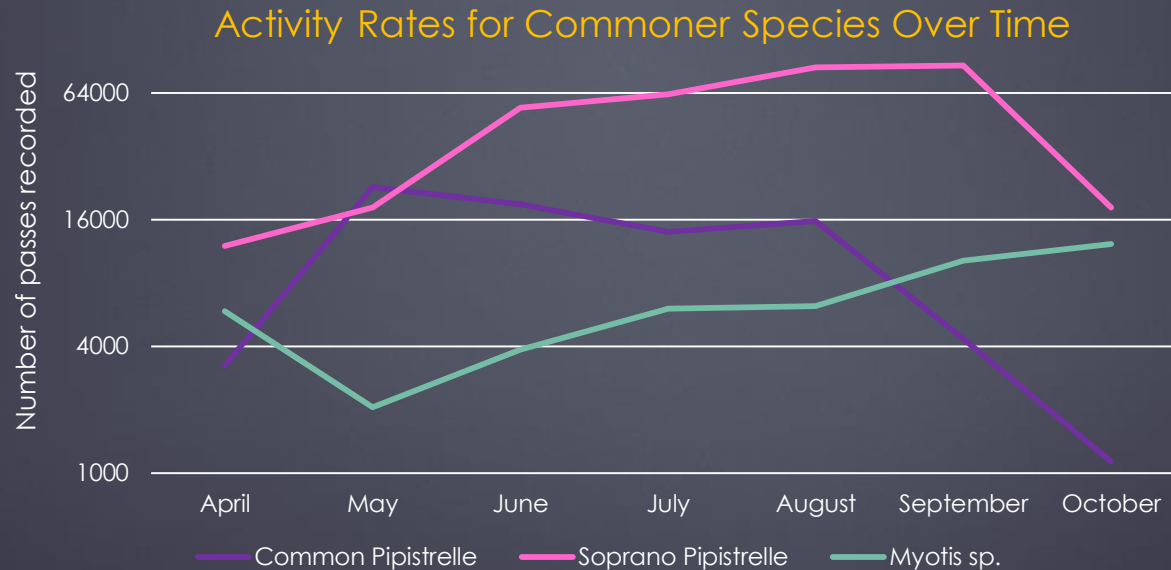
- Other Bats

12 species recorded in total. 6 'rarer' species. High diversity site.

Nathusius' pipistrelle and barbastelle are long distance flyers – suitable corridors essential.

Intense general bat activity levels throughout all of the study area. High abundance.

Peak of common spp. activity in summer months – converse of HS activity – Seasonal shift in function?



3. The Research – Key findings

- **Avon = Important Corridor for Bat Dispersal**

Ancient landscape feature, mostly dark and vegetated – until now?

***Links** key 'nodes' and hotspots – Protected sites only as good as the links.*

- **Avon = Important Foraging Resource**

Foraging resource at key times.

Near to roosting features. Sustains significant populations of other species all year.

- **Lighting is Key**

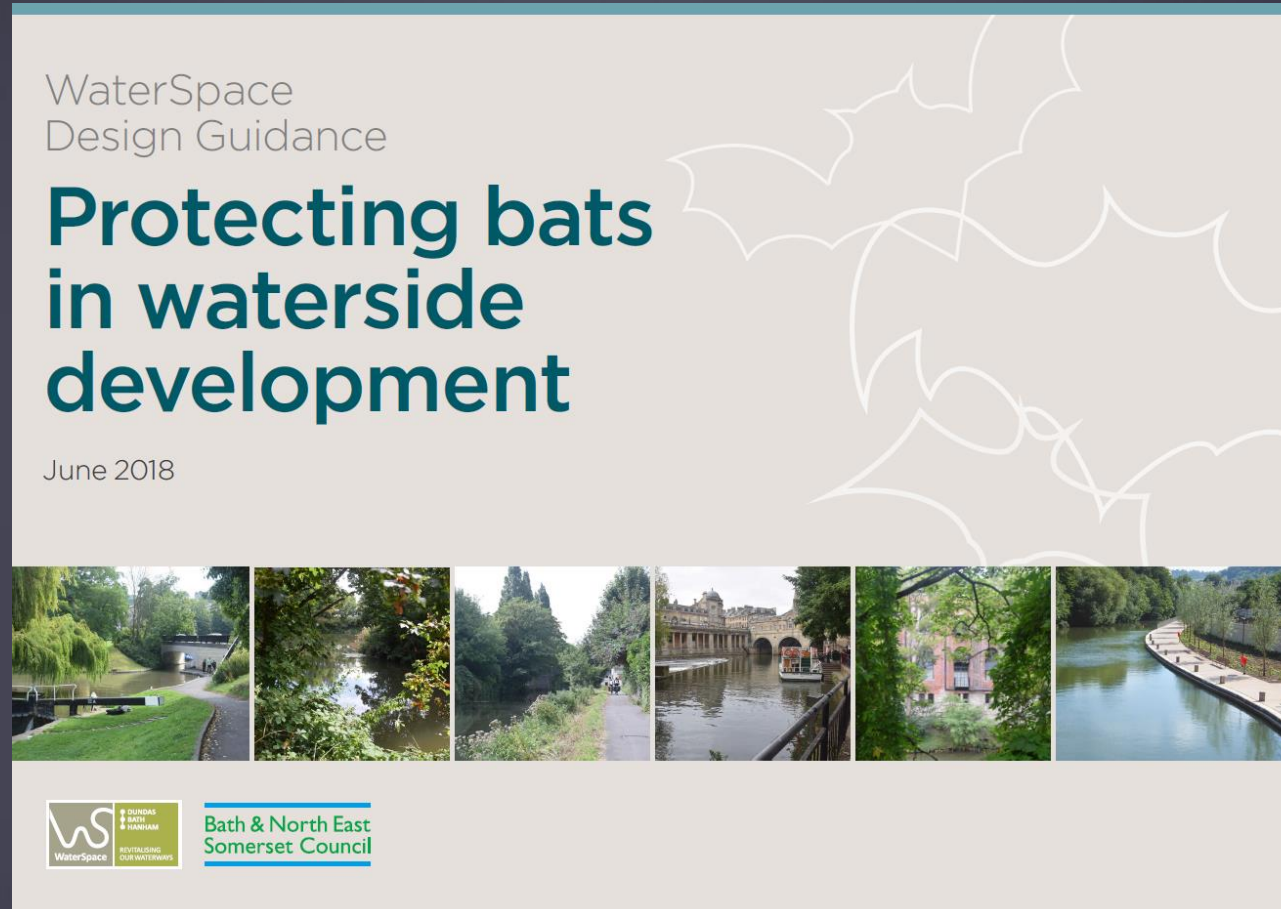
Activity higher in darker locations. Continuously dark corridors essential for movement.

- **Habitat Structure is Key**

Three functions – connectivity, light screening and foraging. Hard landscaping can contribute.

4. The Solution – *Design Guidance*

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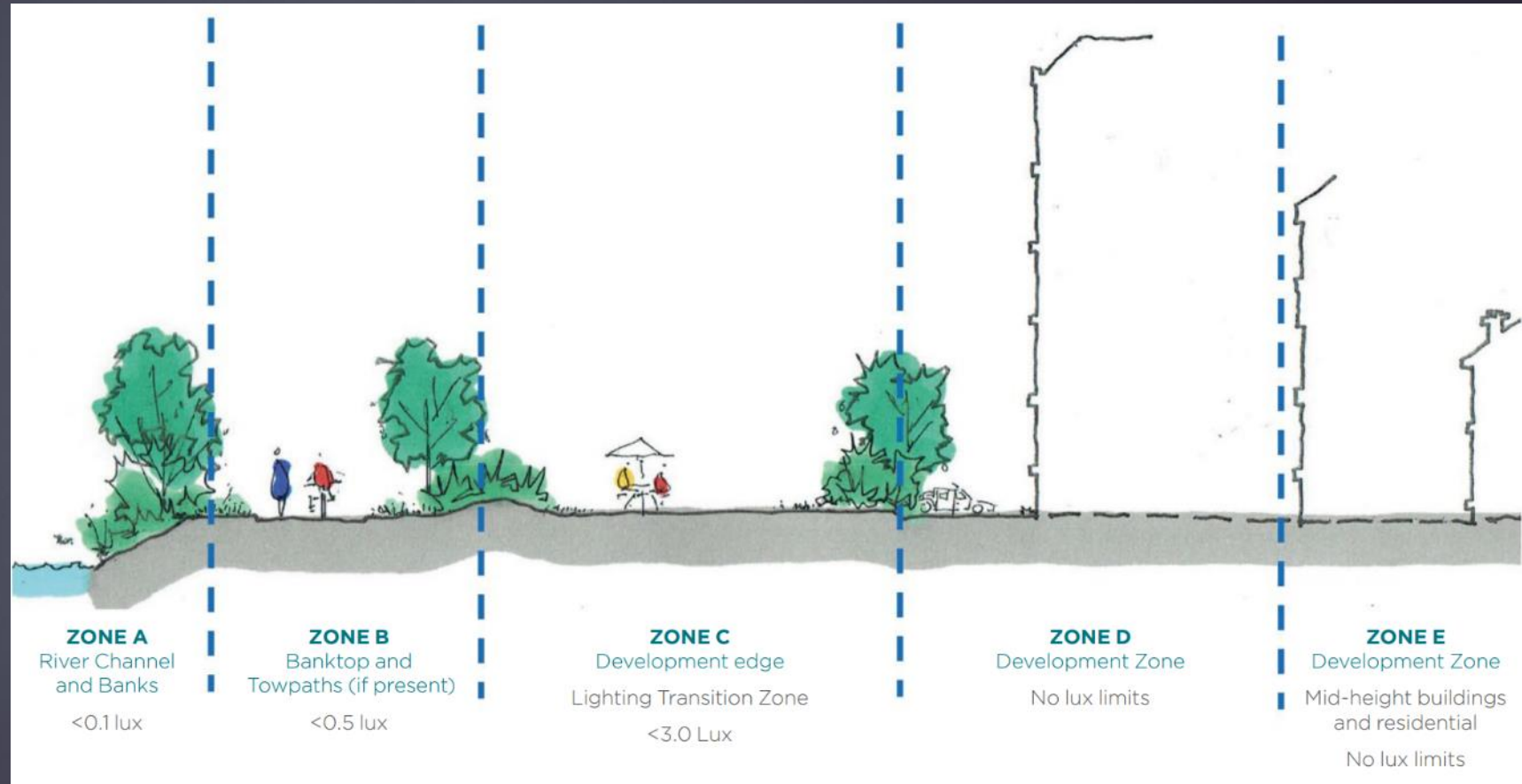
4. The Solution – Design Guidance

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River Corridor Lighting Zones

Radiating zones of diminishing lux and landscaping restrictions.

Exact widths and numbers of zones tailored by ecologist to project.



4. The Solution – Design Guidance

Prescriptive approach to limiting light spill, and maintaining dark, vegetated corridors

In return – developers do not have to carry out any bat activity surveys – as long as they demonstrate compliance!

Zone	A (River Channel and Banks)	B (Banktop and Towpath)	C (Lighting Transition Zone)	D (Core Development Zone/ Urban Zone)
Indicative distance from water's edge covered by zone	0 to approx. 2m	Approx. 2m to approx. 6m	Approx. 6m to approx. 10m	
Description	River channel and banksides. Includes natural and engineered banks, moorings etc. Highest sensitivity zone for bats.	Bank top, which incorporates the towpath on northern bank or riverside walkways elsewhere. In other locations this may include flat ground with habitat continuation of bank vegetation, although may be more scattered. Highly sensitive zone for bats.	Transition zone between undisturbed river corridor and built development. Includes variety of uses and including recreational amenity areas. NB. May contain linear natural features which run perpendicular to river towards Zone D, i.e. hedgerows/trees/walls. Moderately sensitive for bats.	Development Zone. Includes illuminated parking and the first buildings in from the water's edge. Characterised by a dominance of hard standing and built structures. High human activity. Dominated by roads and buildings. Low sensitivity for bats.
Lighting	Lux contours from development <0.1 lux. Must remain unlit with no glare impact from development.	Lux contours from development <0.5 lux. Must remain unlit with no glare impact from development.	Lux contours from development <3.0 lux. Lighting scheme to incorporate innovative lighting solutions – e.g. bollards, cowls, automation, recessed bulbs, walls/screens, smart glazing.	No lux limits. Restrict potential sources of glare from acting upon Zones A-B (e.g. exterior security/flood lighting, light spill from windows) through sensitive lighting design. Building elevations fronting Zones A-B to receive particular focus.
Development	No development typically permitted. Natural habitat and structure to be retained wherever possible. No/limited human access.	No development, although permeable access for cyclists and pedestrians. Fencing may be appropriate. Habitat to be retained and/or reinstated.	Limited development, mostly comprising communal amenity areas, fencing and landscaping or unlit services buildings.	Buildings and hardstanding dominant.
Landscaping	Green infrastructure planting actively encouraged to increase value for bats. Maintenance access only. Fencing may be appropriate	Green infrastructure planting actively encouraged to increase value for bats. Opportunities for light attenuation through soft landscaping in this zone.	Potential for appropriate landscaping and planting of benefit to bats. Landscaping (soft and hard) can be used to screen the river corridor from unintended light spill and activity associated with the development.	Hard landscaping and buildings dominant.

4. The Solution – Design Guidance

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Stepwise Design Process

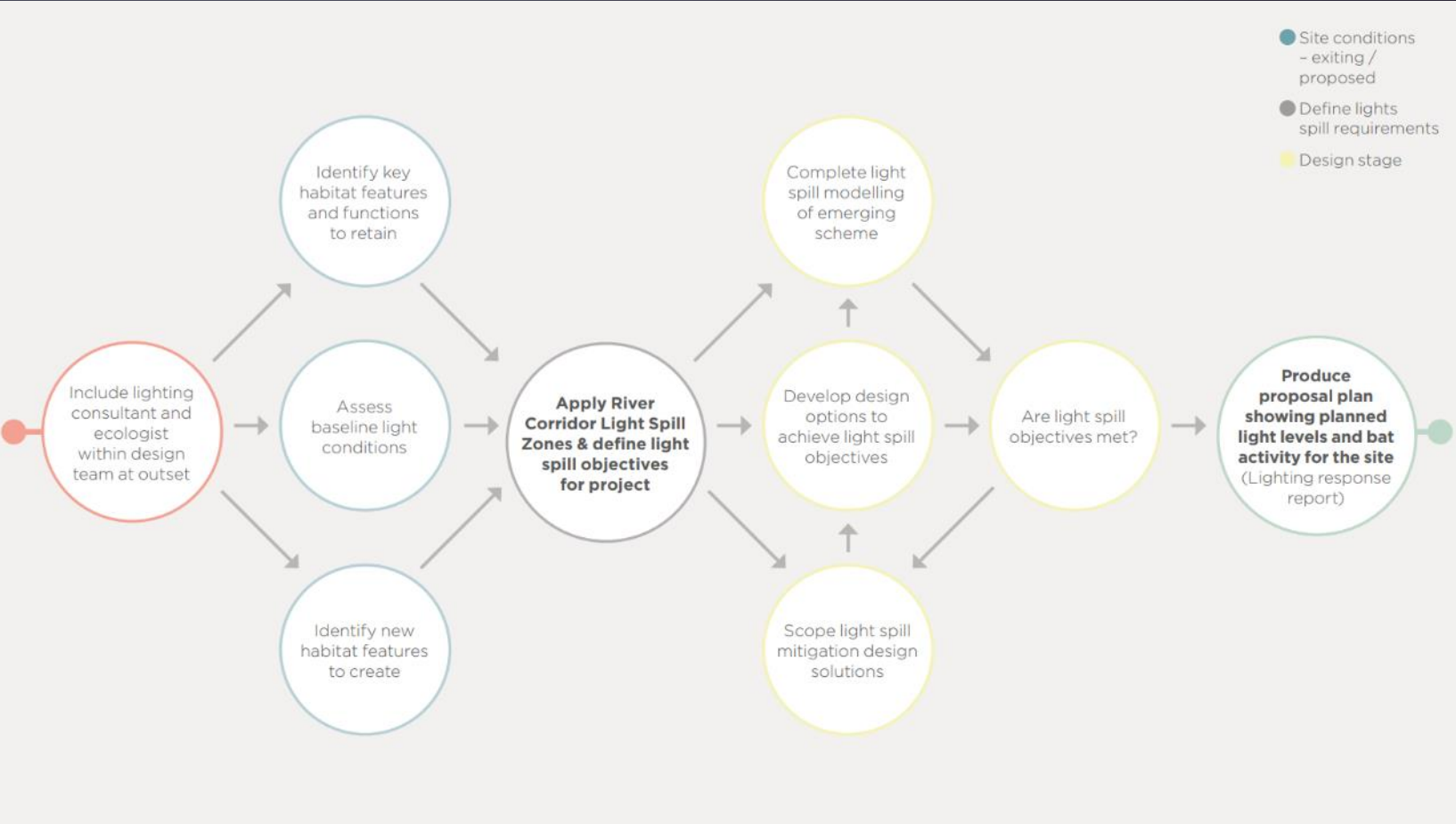
Involves ecologists and lighting engineers from the outset.

Protects key habitats linking to and from river corridor.

Promotes bat habitat as key constraint to development early on.

Ensures robust lighting design and Lighting Impact Assessment with lux levels clearly shown.

Specifies survey scope for non-compliance or where bat roosts suspected.



4. The Solution

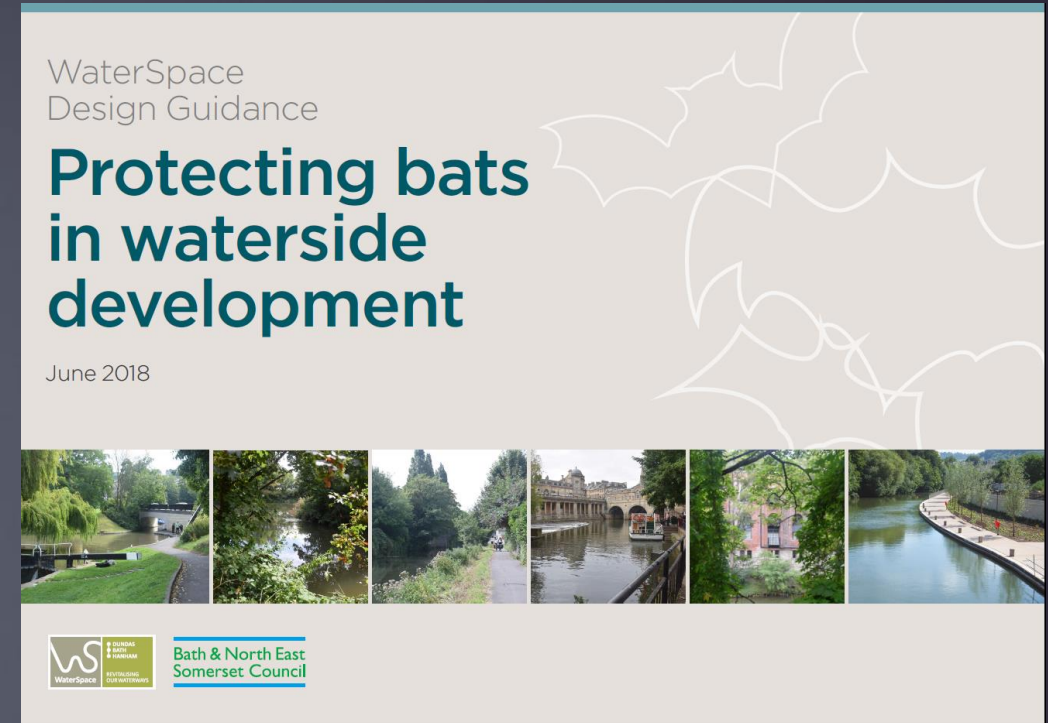
- **Better Clarity in Planning**
 - *Level playing field – consistency*
- **Cost and time saving for BaNES and Developers**
 - *Reduced assessment/consultation time*
 - *Reduced survey requirement – potentially avoiding 12 months of survey*
- **Enhanced protection of GI during development**
 - *Benefits all nocturnal wildlife*
- **Higher quality developments**
 - *Benefits health and wellbeing and sustainability – Natural England targets*

Required content of the Bats and Lighting Response Report

- 1) A summary of off-river bat activity elsewhere within the application site
- 2) Full bat survey data for non-compliant applications
- 3) A summary of baseline illuminance levels, if appropriate
- 4) Lighting Zone boundary maps for the site following application of the River Corridor Lighting Zones
- 5) Details of the light spill mitigation design solutions
- 6) Proposed post development light conditions for the river and bankside vegetation and any other retained or created habitat features
- 7) Planned operational habitat conditions for bats
- 8) Details of habitat management of retained and created habitat features
- 9) Monitoring details proposed to check operational bat activity and light conditions
- 10) Residual impact plan

5. What next

- Use of guidance – little experience/uptake so far
- Monitoring of outcomes
- Drone surveys for detailed corridor light survey
- Pro-active work – remediation of existing lighting
- Feedback and update
- Adaptation for other LPAs/locations



Download at <https://tinyurl.com/yay53o2e>

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