



By Dale Sutton

# *Bats and Watercourses*

**Jan Collins**  
Head of Biodiversity

Bat Conservation Trust



# *Bats and Watercourses*

 How bats use watercourses

 Potential impacts from development

 Planning for bats and watercourses

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So I'm going to talk about how bats use watercourses for their everyday lives, including for roosting, foraging and commuting.

Then I'll talk about the potential impacts that can arise from developments on or close to watercourses.

And finally I'll talk about planning in relation to bats and watercourses, including how to protect and enhance features of importance for the conservation of bats.

## Daubenton's bat



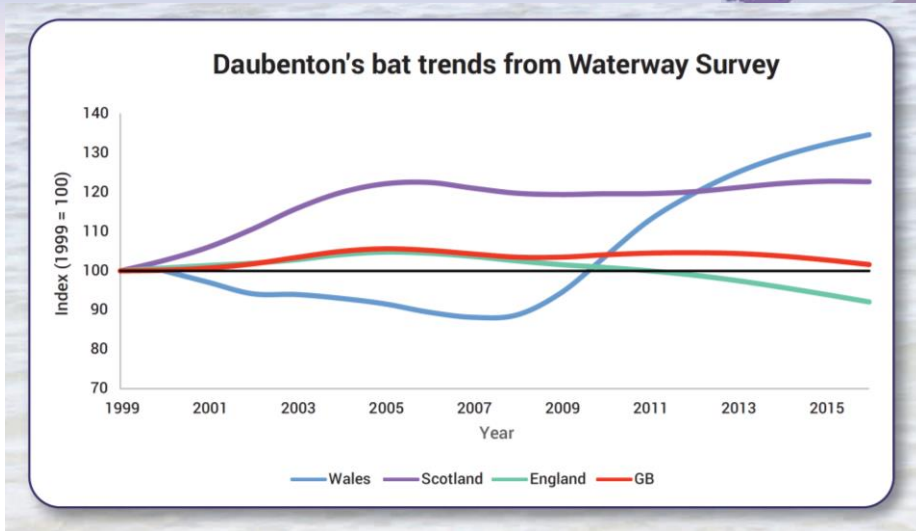
Photos from left, clockwise, by Daniel Hargreaves, Hugh Clark, Dale Sutton and David Martin

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So a bats and waterways talk wouldn't be right without some pictures of this species – the Daubenton's bat, otherwise known as the Water Bat. This species specialises in feeding over water so the classic behaviour is to see the bats flying parallel with the water only a few centimetres above the surface looking for insects that are emerging in order to scoop them up with their rather large feet and eat them. Because of this they tend to feed over smooth water, which I'll come back to later.

# National Bat Monitoring Programme



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We monitor Daubenton's bats populations as part of our National Bat Monitoring Programme.

Volunteers go out and record bats commuting and foraging on waterways. This graph shows trends from the waterways surveys and if you look at the trend for England you can see a slow decline but this is not statistically significant. But perhaps something to watch out for in the future.

So although I've focused in on Daubenton's, most of the other 16 bat species known to breed in the UK also use watercourses either to roost close by or for commuting and foraging.

## Roosting – bridges



Photos by Chris Vine

Bat Conservation Trust



So just thinking about where bats might roost. Firstly, in bridges.

These photos are of a bridge where the A1 crosses the river Kym just north of St Neots in Cambridgeshire. This bridge was first identified as a Daubenton's roost in August 2001 the bridge is mainly used as a maternity roost by up to around 70 bats between around March and October. It's a relatively modern concrete bridge and the bats roost within a small gap between the two halves of the bridge, directly below the central reservation of the A1 dual carriageway above.

This is an example where bats are roosting in quite a disturbed environment. But bats can use all kinds of bridges – anywhere where there is a crack, crevice or cavity could be used, basically!

## Roosting - culverts



Photo by Shirley Thompson

Bat Conservation Trust



Bats can also roost in culverts and we've been working with the Environment Agency to collect data from consultants and other professionals about culvert roosts. We're currently putting together a BCT webpage on Bats and Waterways and we'll have a special culvert survey form on there, enabling us to collect further data moving forwards.

## Roosting - buildings



Photos by *Geoff Billington*

Bat Conservation Trust



And bats roost in buildings associated with water.

The red building is the Patterson building at Ormesby water treatment works in Norfolk that I did some radio tracking work from about 17 years ago. This was a large roost of 200+ Daubenton's in the void under the filter tanks – you can see that on the picture. Not sure if it's still there, I haven't been back in all that time, but I'm sure you'll tell me!

Again, all kinds of buildings can support bats – water mills, barns, houses and so on.

## Roosting - trees



Photos by Geoff Billington and John Haddow (bottom right)

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Bats roost in trees too – these are all photos of Daubenton's roosts in trees (point out the access points) with the exception of the willow on the bottom right, which supports a Noctule bat mating roost!

# Foraging



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So waterways are a really important place for bats to forage.

All of our UK bats feed on insects and waterways, particularly with well-developed bankside vegetation, form a rich source of food.

During the summer maternity period, in particular, it is essential that the females get enough food and that the young can feed close to the roost when they start to fly. But foraging is important year round – for bats to fatten up in spring after hibernation and in autumn before they hibernate again. And bats sometimes emerge from hibernation during the winter on milder nights to feed and drink so access to good foraging grounds is really important year round.

# Commuting



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And waterways play a really important role in bats travelling around our landscape. I've used the Norfolk Broads here as an example of waterways connecting habitats together, allowing the bats to commute to suitable foraging areas from their roosts. And this can be particularly important in heavily urbanised environments, allowing bats safe passage through.

# Impacts from development



- Damage to/loss of roosts
- Degradation or fragmentation of foraging/commuting habitat

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So the types of impacts that we might see from development on or adjacent to watercourses include:

- Damage to roosts, which might be through altering the conditions within a roosting site, such as temperature or humidity, or creating noise or lighting disturbance inside or outside the roost, all of which could cause the bats to abandon it.
- Destruction of roosts is another potential impact, caused by filling gaps in bridges and culverts, lopping or felling trees or converting or demolishing buildings with roosts.
- In terms of foraging and commuting habitat, degradation or fragmentation can be caused by removing bankside vegetation or lighting of the watercourse, which can make it unsuitable for light averse species to use. If a watercourse is lit across its width this may form a barrier to bats moving between their roosts and their foraging areas, which I'll come back to in a moment.
- We've also been working with the Environment Agency – Sarah, in fact, who spoke this morning – on the potential impacts of weir

removal on foraging Daubenton's bats. We think that if the smooth water above a weir is removed by the removal of the weir then this may affect Daubenton's bats foraging behaviour. We have some more work to do on this but would recommend bat surveys before and after weir removal to detect any impacts and mitigate accordingly.

## Legislation and policy

- Conservation of Habitats and Species Regulations 2017
- Natural Environment and Rural Communities Act 2006 - *have regard to the purpose of conserving biodiversity*
- National Planning Policy Framework 2019 - *contribute to conserving nature and securing 'net gains' for biodiversity*

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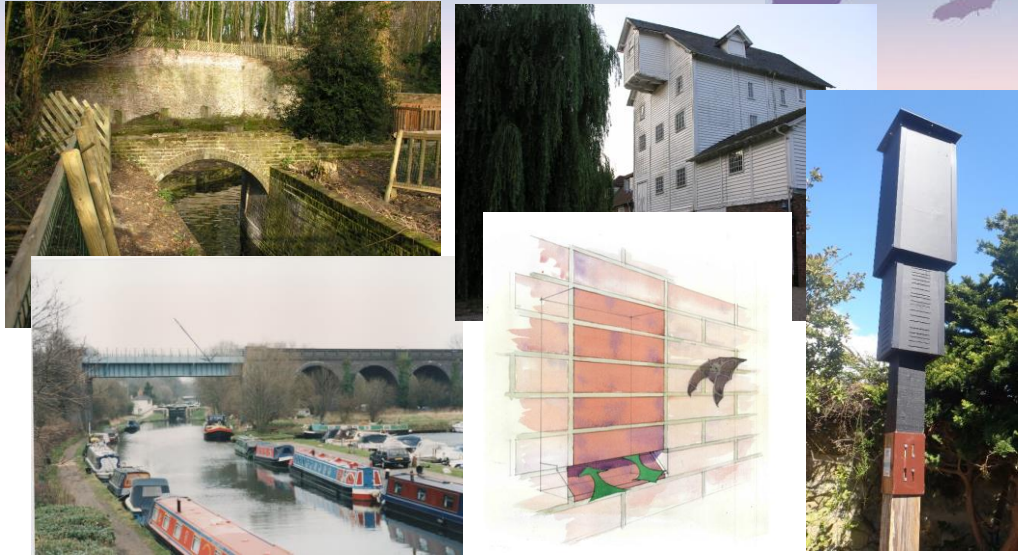
So obviously we have lots of legislation and policy in place to protect bats and their roosts, with these being the main ones – the Conservation of Habitats and Species Regulations, which protects all our bat species from harm and disturbance and protects their roosts from damage and destruction.

We also have the Natural Environment and Rural Communities Act, which requires public bodies to have regard to the purpose of conserving biodiversity.

And the National Planning Policy Framework, which requires public bodies to contribute to conserving nature and securing net gains for biodiversity.

So the big question is how can we do that for bats through the planning process?

## Protect, restore and create roosting habitat



Photos by Shirley Thompson (top) and Patty Briggs (bottom left)

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It's important that we protect existing roosting habitat.

Where developments are proposed appropriate survey work following accepted standards – the BCT Bat Survey Guidelines – should be carried out prior to a planning application being submitted. In the first instance impacts should be avoided but if that's not possible then a licence from Natural England may be required to proceed with a development legally. The licence will be written by an ecological consultant and contains information on how to protect bats from harm and disturbance at sensitive times of the year and how to provide roosting sites for the bats in the longer-term post-development.

And then we should all be thinking about enhancements – can roosts be proactively built into buildings and bridges or bat boxes be added to buildings or trees? The pictures on the bottom right show a Habibat bat box built into a wall and a free standing rocket box on a pole. So these are options for enhancement.

## Protect, restore and create riparian habitats



Photos by Shirley Thompson

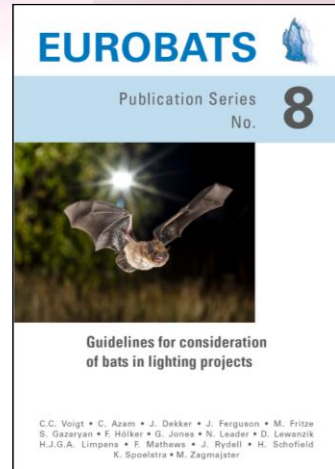
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And it's so important to think not only of roosts but also of where the bats can feed and also how they will get there. Natural watercourses with bankside vegetation and overhanging trees form the best type of habitat and these should be protected, restored and created where possible.

Sarah did some research on bat activity in riparian habitats and found that although the activity of pipistrelle bats was the same in good and poor quality riparian zones, there were significantly more feeding buzzes associated with better quality ones.

# Lighting



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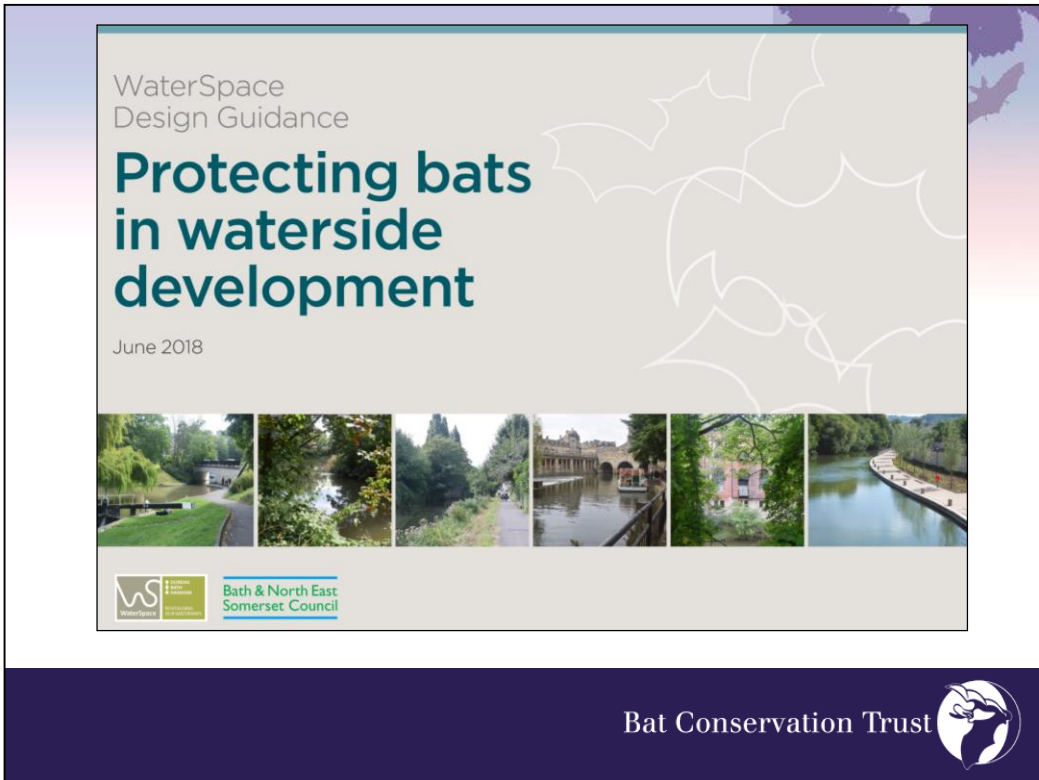
And lighting is a really key issue on watercourses. We published Bats and Artificial Lighting in the UK with the Institute for Lighting Professionals in 2018 and the Eurobats guidelines followed soon after. The BCT and ILP publication provides evidence about the impacts of lighting on bats.

Certain types of light sources attract insects, which creates a deficit of insects in the darker areas and gives a competitive advantage to those bat species that feed around lights, putting bat species that avoid light at a competitive disadvantage.

We think that lighting increases the risk of predation for bats so some of our slower flying species will avoid it. This means that lighting can pose a barrier to movement for these species – so if we light the full width of a waterway we may be cutting off a commuting route that is important for bats travelling from their roost to their foraging grounds. And lighting can delay emergence from a roost, cutting short foraging time and ultimately affecting the fitness of the population.

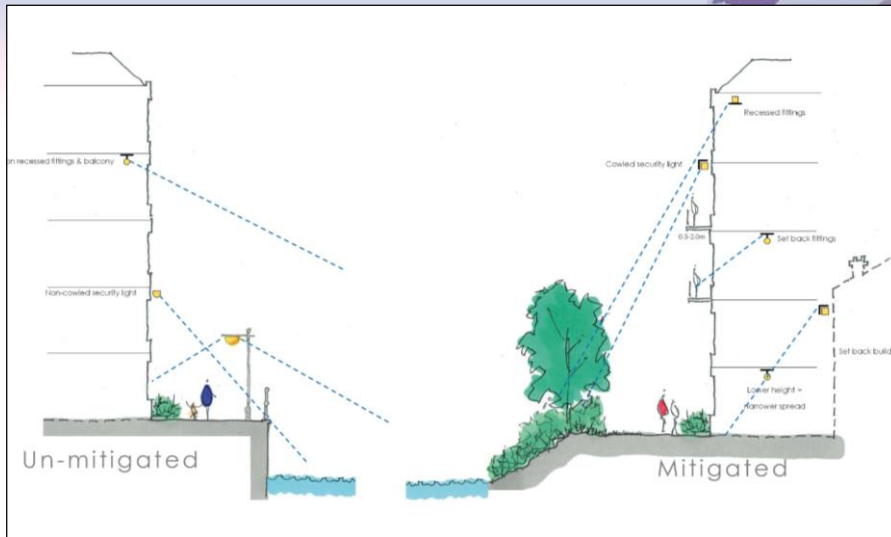
The type of lighting is really important when considering impacts on bats. Lighting should lack any UV elements, a warm white spectrum is

best to reduce blue light, which can attract insects. Different species have been shown to respond differently in the presence of different coloured light but red light appears not to impact activity, which will be interesting to put into practice.



Bath and North East Somerset Council have produced supplementary planning guidance on protecting bats in waterside development and I think this is another really great resource and worth looking up.

# Mitigation measures

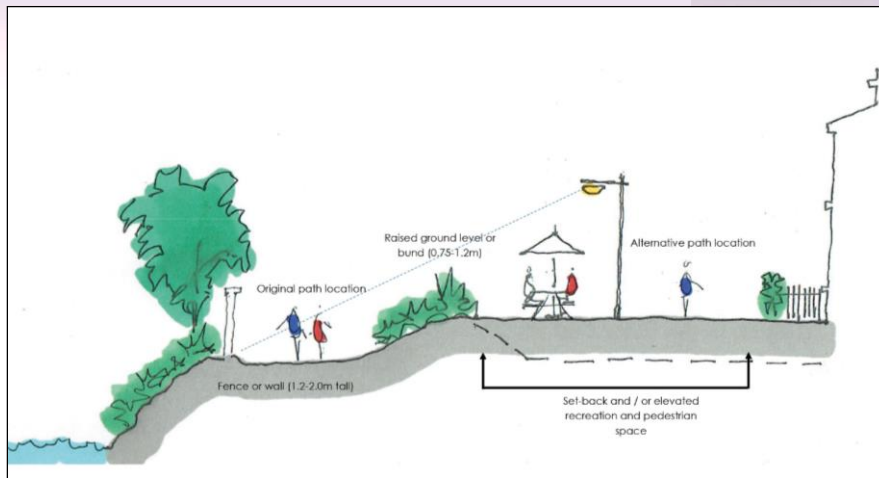


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The guidance contains really simple figures like this one, which shows an unmitigated waterside development on the left and a mitigated one on the right. So the types of mitigation that are appropriate include naturalised banks, bankside trees to shield the watercourse from lighting and set back, recessed and cowed light fittings to minimise light spill.

# Mitigation measures

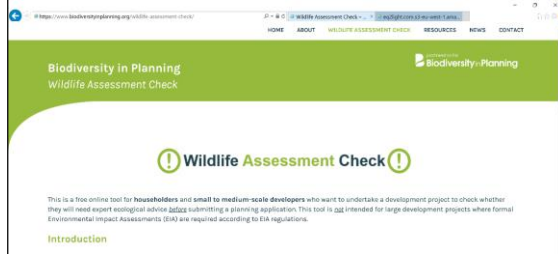
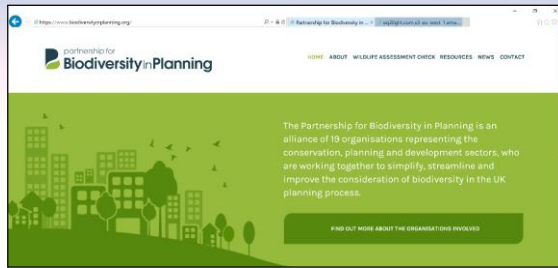


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So here's another diagram from the guidance on the design of waterside development – in this case they've changed their original design by moving the path further away from the water and elevating it, also adding a fence or wall to prevent light spill from reaching the waterway.

# Partnership for Biodiversity in Planning



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Finally, I have a shameless plug for our Partnership for Biodiversity in Planning Project. This is a project funded by the Esmee Fairbairn Foundation bringing together 19 organisations from the conservation, planning and development sectors.

We have a website and a tool called the Wildlife Assessment Check, which provides an early assessment of whether ecological input will be needed for a planning application. We have targeted small and medium sized developers and those LPAs that don't have access to ecological expertise in particular with this project, with the aim of triggering developers to seek ecological advice and commission surveys and reports before they submit a planning application. We're currently asking LPAs to have a look at the tool and put a link on their websites so if you're interested please do come and find me for a chat – I have some postcards with the relevant links.

And we've also produced a Planning Advice Note with the RTPI, which will be launched tomorrow. So look out for that.

## Daubenton's bridge emergence

<https://www.bing.com/videos/search?q=daniel+hargreaves+daubenton%27s+you+tube&view=detail&mid=6684CA043E93226E33736684CA043E93226E3373&FORM=VIRE>

Video by Daniel Hargreaves

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So I put this in just in case I had any time at the end of the presentation. This is a video of Daubenton's bats emerging from crevices in a bridge that I thought you might like to see, created by Daniel Hargreaves