RISE | Retrofit information, support & expertise

Ecological Constraints and Opportunities Toolkit

RISE Discovery

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Summary

This quick guide has been prepared to help Grant Recipients (GRs), delivery partners and contractors understand the ecological constraints and opportunities that may arise during retrofit projects. While retrofit programmes are designed to improve building performance and reduce carbon emissions, buildings and surrounding landscapes often support protected species and valuable habitats that require careful consideration.

This guide provides practical, species-focused advice covering common signs, typical retrofit risks, recommended actions, opportunities for enhancement and key contractor considerations for bats, nesting birds, hedgehogs and reptiles.

Readers that would like this document in a more accessible format should contact **rise@turntown.co.uk**.

Why ecology matters in retrofit

Retrofitting homes is often viewed as **a low-impact activity** because it improves existing buildings rather than constructing new ones. However, many buildings and surrounding green spaces provide **important habitat for wildlife**, including features such as roof voids, soffits, cavity walls, gardens, hedgerows, and mature trees.[1]

Identifying potential ecological constraints from the earliest stages of project development allows appropriate surveys, mitigation measures and enhancement opportunities to be built into retrofit programmes before works begin.

Failure to consider ecology can result in:

- Delays to programme delivery
- Additional survey and consultancy costs
- Seasonal restrictions on works
- Licensing requirements
- Enforcement action where protected species are harmed
- Reputational impacts for delivery organisations

Increasingly, retrofit is being viewed as an opportunity not only to improve energy efficiency, but **also to contribute positively** to nature recovery, climate resilience and healthier communities.

The retrofit ecology journey

Ecological considerations should be reviewed throughout the end-to-end retrofit process, from the earliest assessment and project planning stages through to design, construction and completion *(Figure 1)*:

[1] External Wall Insulation (EWI) and Associated Works Toolkit - Ceredigion County Council

Retrofit stage	Ecological considerations
Assessment	Surveyors, assessors and project teams should look for **signs of protected species**, valuable habitats and features that may support wildlife.
Survey	Where ecological constraints identified, **specialist ecological surveys** may be required. Survey requirements vary depending on species and are often **seasonally constrained**, making early identification particularly important.
Design	Design teams should apply the **mitigation hierarchy** and consider how impacts can be avoided or minimised. Biodiversity enhancement measures be incorporated where feasible.
Delivery	Construction and installation activities should follow any ecological **recommendations**, **method statements** or **licence requirements**. Contractors should be aware of ecological constraints before works commence.
Completion	Retrofit projects should leave sites in a **better ecological condition** wherever possible through the delivery of biodiversity enhancements, appropriate habitat protection measures, and monitoring.

Figure 1: Table depicting the retrofit process stages and respective considerations. Source: Turner and Townsend.

Applying the mitigation hierarchy

The mitigation hierarchy provides a simple framework for managing ecological impacts. It is a tool that acts as a "a mechanism for making explicit decisions that balance conservation needs with development priorities."[2]

The sequence of actions includes; **avoidance** if possible; **minimisation** if unavoidable; and when impacts occur, **restoration**; as well as **offsetting** where significant residual impacts remain *(Figure 2)*.

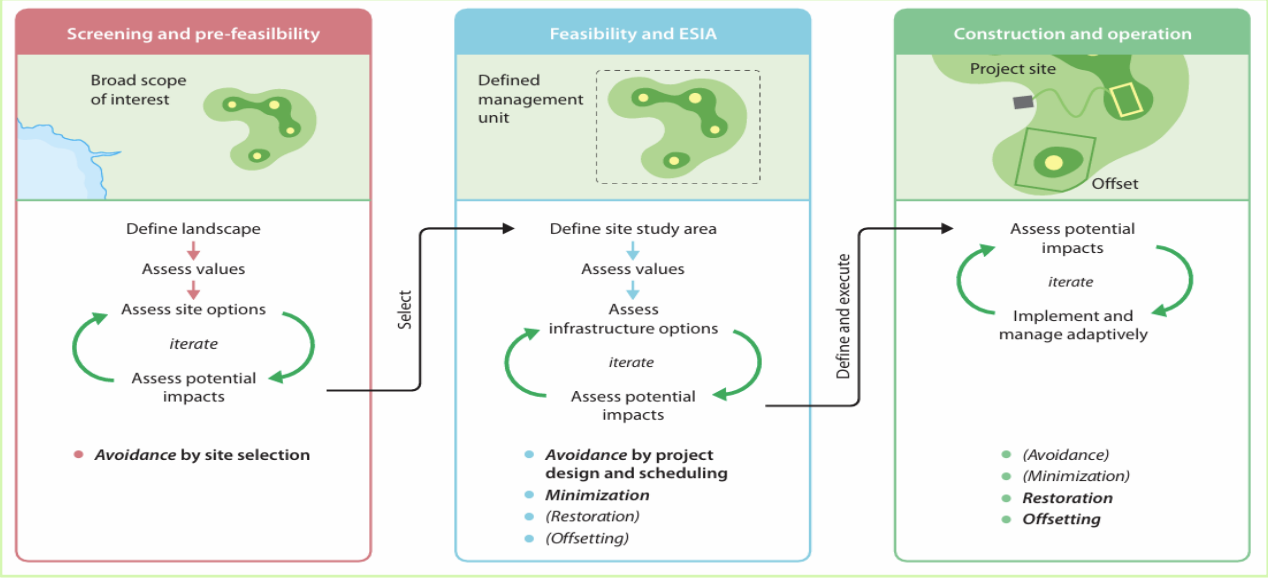


Figure 2: Applying the mitigation hierarchy across three broad stages of the project timeline. Source: CSBI.

[2] A cross-sector guide for implementing the Mitigation Hierarchy (CSBI)

Figure 3: Soprano pipistrelle. Source: Woodland Trust.



Bats

Species fact file

Habitat: Woodlands, wetlands, parkland

Including:
Common pipistrelle, soprano pipistrelle, brown long-eared

Common signs

- Droppings beneath rooflines / access points
- Dark staining around entry holes and gaps
- Bats emerging from buildings at dusk

Common retrofit risks

- Roof replacement: can damage or destroy bat roosts.
- Sealing access points: cavity wall, eaves, etc become inaccessible or can trap bats inside
- Roof membrane replacement: non-bitumen coated materials can snag bat claws

Opportunities

- **Bat bricks:** integrated features built into walls that provide secure long-term roosting habitat (installed at least 4m above ground).
- **Bat boxes:** roost structures fixed to buildings or mature trees, with designs available for crevice-dwelling species or larger cavity-roosting bats.
- **Wildlife-sensitive lighting:** lighting designed with shields and timers to reduce disturbance to bats and maintain commuting routes.
- **Native planting:** night-scented flowering plants and hedgerows support insect populations that provide a food source for bats.
- **Bat-friendly materials:** approved roofing membranes that reduce the risk of snagging while accessing roosts within roof spaces.

What to do

1. **Retrofit Assessment**
   Look for signs of bat activity, including droppings, staining around entry points, feeding remains. Record any evidence and seek ecological advice where appropriate.
2. **Design Stage**
   If potential bat roost is identified, design works to avoid impacts by retaining access points and applying the mitigation hierarchy. Consider if ecological surveys may be required.
3. **Construction**
   Take care when working on roof coverings, loft spaces, soffits, fascias, cavity walls, eaves, vents.
4. **Completion**
   Provide integrated bat boxes, bat roost features or retained access points.

Laws and protection

- All UK bat species and their roosts are protected under the **Wildlife and Countryside Act 1981.**
- Bats are also protected under the **Conservation of Habitats and Species Regulations 2017**, making it illegal to damage, destroy or obstruct access to a roost even when bats are not present.
- Bats are 'Species of Principal Importance' under **Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.**

Golden rule: Never block, damage, or disturb a bat roost.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active												
Maternity												
Hibernation												

Figure 4: Ecological survey calendar for bats.

NOTE: Information on recorded bat sightings in your area can be obtained at: The Big Bat Map.

Figure 5: House martin. Source: Woodland trust.



Nesting birds

Species fact file

Habitat: Towns, villages, farmland

Including:
Starling, swallow, house martin, swift, barn owl

Common signs

- Birds repeatedly entering building fabric
- Nesting materials beneath eaves or soffits
- Bird droppings below building access points

Common retrofit risks

- Roofline works: roof, soffit and fascia replacement can disturb active nests
- Scaffolding installation: works near active nests risks disturbance / nest abandonment
- Outbuildings: insulation and conversions can damage nests, especially for barn owls

Opportunities

- **Swift bricks:** integrated nesting cavities built into external walls, typically installed at least 5m above ground on suitable elevations.
- **Sparrow terraces:** multi-compartment nest boxes, usually containing three individual nesting chambers, designed to support colony-nesting.
- **House martin cups:** cups installed beneath eaves and overhangs, providing nesting opportunities where traditional mud nests have been lost.
- **Barn owl boxes:** boxes installed within suitable barns, agricultural buildings or mature trees to provide secure nesting and roosting habitat.
- **Berry - and seed - producing species:** prioritise planting such as hawthorn, rowan, elder and guelder rose to extend food availability.

What to do

5. **Retrofit Assessment**
   Check rooflines, eaves, soffits, walls and outbuildings for signs of nesting activity, including nests, nesting materials, droppings and repeated bird movements.
6. **Design Stage**
   If nesting birds / features are present, plan works to avoid disturbance during the breeding season. If a Schedule 1 species is suspected, contact an ecologist to confirm nest status and mitigation measures.
7. **Construction**
   Avoid disturbing active nests. Delay, reschedule or amend works until nesting activity has finished.
8. **Completion**
   Consider purpose-built nesting features to provide long-term habitat opportunities.

Laws and protection

- Nearly all wild birds, their active nests and eggs are protected under the **Wildlife and Countryside Act 1981**.
- It is an offence to damage or destroy an active nest or disturb nesting birds.
- Barn Owls are listed on **Schedule 1 of the Act** and receive additional protection against disturbance while nesting or when dependent young are present.

Golden rule: Avoid disturbing nests during the breeding season

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active												
Breeding												

Figure 6: Ecological survey calendar for nesting birds.

NOTE: Information on recorded bird sightings in your area can be obtained at: Where's That Bird?.

Figure 7: British hedgehog. Source: Wildlife trust.



Hedgehogs

Species fact file

Western European
(Erinaceus europaeus)

Habitat: Gardens, hedgerows, farmland

Common signs

- Dark, cylindrical droppings approx. 5cm
- Tracks and small footprints
- Grunting and snuffling noises

Common retrofit risks

- Inaccessibility: fences/scaffolding can block movement
- Hazards: temporary holes/pits can cause entrapment
- Entanglement: netting and other plastics can cause harm or death

Opportunities

- **Hedgehog highways:** ground-level boundary holes in fences enable connectivity, they should measure 13x13cm. Hedgehog highway plaques can also be purchased.
- **Hedgehog houses:** wooden structures providing shelter for breeding / hibernating hedgehogs.
- **Sloped access**: create ramps in to avoid entrapment in hard-to-reach places.
- **Log piles**: natural features which provide foraging and shelter.
- **Education:** hedgehog-friendly communication in resident packs to raise conservation awareness.
- **Limit use of chemicals:** use of pesticides, herbicides and rodenticides can be highly toxic and can cause harm to entire neighbourhood foodwebs.

What to do

9. **Retrofit Assessment**
   Look out for any signs of hedgehog activity, including droppings and tracks. Speak to residents to see if hedgehogs have been sighted near the property.
10. **Design Stage**
    If hedgehogs are present, design mitigations into preparatory and installation works – including hedgehog highways, coving over any temporary pits/holes and leaving no plastic litter on site.
11. **Construction**
    Be mindful to avoid clearing log piles, or dense vegetation to avoid disturbance.
12. **Completion**
    Consider installing hedgehog houses, native hedgerows, and providing sloped access where required.

Laws and protection

- Listed on schedule 6 of the **Wildlife and Countryside Act (1981)** which makes it illegal to kill or capture wild hedgehogs
- Listed under the **Wild Mammals Protection Act (1996)**, which prohibits cruel treatment of hedgehogs
- They are a 'Species of Principal Importance' under the **NERC Act 2006** which means there is a 'duty of responsibility' to public bodies.

Golden rule: Do not leave hazards for hedgehogs overnight.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active												
Hibernation												

Figure 8: Ecological survey calendar for hedgehogs.

NOTE: Information on recorded hedgehog sightings in your area can be obtained at: The Big Hedgehog Map.

Figure 9: Slow worm. Source: Woodland Trust.



Reptiles

Species fact file

Habitat: Rough grassland, brownfield land

Including:
Common lizard, slow worm, grass snake, adder

Common signs

- Shed reptile skins in vegetation
- Small dark droppings with a white urate tip
- Tracks or trails in loose soil, dust, sand, or mud

Common retrofit risks

- Vegetation clearance: scrub and grassland removal can destroy sheltering habitat
- Groundworks: excavation / site preparation can harm reptiles in refuge areas
- Storage: pallets and stored equipment can crush reptiles or block access to habitat

Opportunities

- **Wildflower grassland:** areas of diverse flowering plants and grasses, providing shelter, basking areas and prey species for reptiles and other wildlife.
- **Habitat piles:** stacks of logs, brash, stones or rubble positioned in sunny locations to provide hibernation opportunities and protection from predators.
- **Habitat corridors:** connected strips of vegetation, hedgerows, rough grassland that allow movement between feeding, breeding and hibernation areas.
- **South-facing basking areas:** sunny areas incorporating rocks, bare ground or timber can provide important thermoregulation opportunities.
- **Resident education:** wildlife-friendly guidance can raise awareness of reptiles, reduce persecution and encourage management of green spaces.

What to do

13. **Retrofit Assessment**
    Identify areas of suitable reptile habitat, including rough grassland, scrub, etc. Record any signs or sightings of reptile activity.
14. **Design Stage**
    Where suitable habitat is present, seek ecological advice early on survey requirements and mitigation measures to protect habitats.
15. **Construction**
    Use phased vegetation clearance where possible for dense vegetation to allow reptiles to move away from affected areas. Avoid storing materials (e.g. containers) in potential habitats.
16. **Completion**
    Enhance the site with habitat piles, native planting efforts etc. to support reptiles and wider biodiversity.

Laws and protection

- The **Wildlife and Countryside Act 1981** protects the common lizard, slow worm, grass snake and adder from intentional killing or injury.
- All native reptiles are 'Species of Principal Importance' for biodiversity conservation in England under the **NERC Act 2006**.
- Additional legal protection applies to rarer reptile species in the UK such as the sand lizard and smooth snake.

Golden rule: Avoid disturbing suitable reptile habitat prior to checks.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Active												
Breeding												
Hibernation												

Figure 10: Ecological survey calendar for reptiles.

NOTE: Information on recorded reptile sightings in your area can be obtained at: The Record Pool UK.

Contractor ecological checklist

This checklist below can help local authorities and housing providers gain confidence and provide assurance that ecological considerations have been incorporated throughout retrofit delivery.

Before Works

- Has a retrofit assessment been completed?
- Have ecological risks been reviewed?
- Have potential protected species been identified?
- Are seasonal restrictions understood?
- Have surveys been completed where required?
- Has ecological advice been obtained where necessary?
- Have licences been secured where necessary?
- Have contractors been briefed on ecological risks and responsibilities?
- Have biodiversity enhancement opportunities been identified?

During Design

- Can impacts be avoided?
- Has the mitigation hierarchy been applied?
- Have existing habitats been retained where possible?
- Bat access points considered?
- Bird nesting features considered?
- Habitat connectivity maintained?
- Tree protection measures included?
- Biodiversity enhancements designed into the scheme?
- Appropriate materials specified?
- Green infrastructure opportunities explored?

During Construction

- Toolbox talks completed?
- Ecological method statements available?
- Protected features marked on site?
- Contractors aware of constraints?
- Agreed materials being used?
- Habitats protected from accidental damage?
- New wildlife features installed correctly?
- Ecological incidents reported immediately?
- Site inspections completed where required?
- Licence requirements followed?
- Biodiversity commitments delivered?

Next steps

You should now have a clearer understanding of how ecological considerations fit within retrofit project delivery and why nature should be considered alongside carbon reduction objectives from the earliest stages of programme planning.

Your next steps are to:

1. **Review** upcoming retrofit projects for potential ecological constraints.
2. **Establish** processes for identifying ecological risks during assessments.
3. **Engage** ecological specialists early where risks are identified.
4. **Build** biodiversity enhancement measures into project designs.
5. **Ensure** contractors understand ecological responsibilities before mobilisation.
6. **Monitor** delivery of biodiversity enhancements alongside retrofit measures.

For further guidance, refer to the **'Green Thread: How Nature Can Transform Resident Engagement in Retrofit' case study** and related resources available through the RISE Knowledge Hub. Please keep an eye out for our **Nature series: Ecological mitigation in planning | RISE Masterclass** session recording which will be uploaded soon.

Resources

Relevant resources:

- Managing the Presence of Bats – RISE Case Study
- Environmental sustainability and housing growth – UK Parliament Report
- A cross-sector guide for implementing the Mitigation Hierarchy – CSBI
- Survey season calendar – with notes – UEEC
- Bat Conservation: Rules and Regulations for Roofing Work
- Forgotten residents: considering the impact of retrofit on biodiversity