This audit should be completed with reference to the **Lesser Horseshoe Handbook** (Schofield, H.W., 2008) and **EUROBATS publication series 4: Protection of overground roosts for bats** (Marnell, F. and Prestnik, P., 2010). The purpose of the audit is to identify the work needed to retain or enhance a roost by assessing it under five criteria, all of which impact on the longevity and suitability of the structure for lesser horseshoe bats. The results of each section should then be entered in the Table provided and further detail added in the Summary Box.

Ownership and location details

Roost name:
Grid Reference: (please attach a map if available showing roost location)
SAC Code where applicable:
Name of owner:
Address of owner:
Telephone/Mobile number:
Completed by:
Date:
Roost Reference Number (Office Use only):

How are the bats using the site?

Maternity/Nursery ☐
Hibernation ☐
Night roosting ☐
Satellite/transitionary roost ☐

What is the general population trend at this roost?

Increasing ☐
Decreasing ☐
Stable ☐
Unclear/Unknown ☐

Section 1. Security of the site

This section covers the structural integrity and external safety features of the roost site. Bat roosts should be structurally sound, secure from vandalism and not compromised by inclement weather events or surrounding vegetation.

(a) Is the building in good structural condition or does it need repairs?

(b) Is the building weatherproof, ie, are the roof, gutters, windows and doors in good condition? Are there open areas of the building exposed to the weather?

(c) Is the roost likely to be disturbed by:

a. Dual usage of building (constant or intermittent sound from human occupation, security systems, generators); smell (from human occupancy); external lighting, location of bat access (conflicting with human access to the structure)

b. Predators: are the entrances accessible to predators? Is there any predator-proofing in place?

c. Vandalism/non-authorised access:
    i. Is the building securely fenced?

    ii. Are the bat entrances effectively grilled? Grills should be the right spacing to stop human access (consider children) whilst allowing bats to fly through.

    iii. Are the human entrances safely locked?

    iv. Are there signs to warn trespassers about the roost and legal implications of disturbing the bats?

(d) Could the integrity of the building be compromised by surrounding vegetation, i.e. trees or branches falling over roost, lightening, fire or flooding?

Considering all the features above, please describe how can the security of the site be improved?

Section 2. Bat access

This section covers the importance of the entrances the bats use to enter and exit the roost. An ideal roost has entrances on the ground floor and facing vegetation, and at least two entrances. The size, height and aspect of the entrances are also important features.

(a) How many entrances are there?

(b) Is/are the entrance/s of suitable dimensions to suit horseshoe bats? Ideally 0.25m^2 and a minimum height of 20cm.

(c) Is there light spill at entrances or light sampling areas?

(d) If the entrance is smaller, is there a porch or similar light sampling feature?

(e) Are the entrances exposing the bat roosting areas to weather, predators or nesting birds? Are they in the best location possible on the building?

(f) Do the bats emerge into vegetation cover?

(g) Are the entrances at risk of becoming blocked by vegetation or debris?

Considering all the features above, how can the entrances be modified to improve roosting conditions and safe access to the roost?

Section 3. Microclimates and light

This section covers the internal roosting opportunities available for the bat colony. Ideal horseshoe bat roosts should provide the bats with access to a range of micro-climatic conditions. This can make the colony more resilient to extreme weather periods, which are predicted to become more frequent with climate change. Light levels should also be minimised.

(a) Is there light spillage inside the roost?

(b) Is the roost insulated from draughts and high winds?

(c) Does the roost have a hotbox(s) or warm space(s) (such as compartments using triangular baffles) of a suitable size/number for the colony?

(d) Does the roof material favour solar gain? The roof should be directly exposed and not shaded by vegetation or other structures.

(e) Are there cooler areas that the bats can use during extremely hot periods? Ideally these are located on the North face of a building.

(f) Does the roost provide a hibernation site with adequate humidity and sustained cool temperatures?

(g) Does the roost provide alternative roosting spaces for the bats such as alcoves or a chimney stack?

Considering all the features above, how can modifications be made to provide a wider range of microclimate conditions?

Section 4. Internal structure and materials

This section covers the importance of internal structures and materials used within a bat roost. Surface material and ample coverage are important features so that bats can utilise as much of the space as possible. The right materials need to be used to avoid posing a threat to the bats.

(a) Is there a roof membrane? Currently the only 'bat safe' roofing membrane is bitumen 1F felt (non-woven and short fibred). Check the membrane isn't damaged or detached.

(b) Is there enough height to the apex of the roof, with uncluttered space for free flying?

(c) Are there perching areas along the gradient of the roof and at different heights within the roost? If mesh has been used to provide perching opportunities, the grid of the mesh should be 5x5mm maximum to avoid bats becoming trapped and should be tightly fastened to the surface. Using untreated wood strips is a safer perching option.

(d) Are there any materials in the roost that may prove hazardous to the bats?

(e) Is there a large accumulation of droppings, ie, several centimetres thick (especially in long established large roosts) in attic spaces or on floors under low ceilings that might be detrimental to the colony?

Considering all the features above, how can modifications be made to improve the internal structure and materials used within the roost?

Section 5. Landscape around the roost

This section covers the suitability of the habitat around the roost. Ideal roosts have known commuting routes and foraging habitat within the core sustenance zone around it and good vegetated corridors for dispersal. Questions relating to the impact of light on the colony's movements can only be accurately assessed by a night visit and should take into consideration the loss/absence of leaf cover in autumn/spring.

(a) Landscape permeability: Is the roost well connected (by linear features, such as hedgerows) to suitable foraging habitat and water sources? Are these free from the effect of artificial light sources?

(b) Is the roost legally protected?

(c) Is the surrounding habitat legally protected?

(d) What is the main land use surrounding the roost – agriculture, commercial forestry, broadleaf woodland?

(e) Is the roost and/or surrounding habitat at risk from development or other potentially detrimental actions, for example, forestry operations; invasive species management/clearance resulting in the loss of a commuting route or light buffer; the potential for noise to impact on the roost or commuting/foraging areas; recreational developments/public security/or other safety issues that might lead to additional lighting?

(f) Knowledge of other roosts in the area – are these known, are they used by the bats from this roost, how far are they, are they protected, is there good connectivity?

(g) Are there any infrastructures such as roads or fixed lighting that could affect the population? Again, consider how changes in how light levels will vary within the landscape at different times of the year.

Considering all the features above, how can landscape features be improved for this site?

		Action	Tick each action where improvement is needed
Section 1. Security of the site	Improve structural integrity of the building	Repair foundations	
		Rebuild walls	
		Reroof (ideally slate roof)	
	Weatherproof building	Repair roof	
		Repair walls	
		Repair/block windows and external doors	
		Install/repair gutters	
	Reduce disturbance	Soundproof	
		Remove external lighting	
		Predator-proof entrances	
		Install/repair fence	
		Install/replace grill(s)	
		Install/replace locks	
		Install/replace signage	
	Safeguard integrity	Clear overhanging/dangerous vegetation	
		Install/replace lightening conductor	
		Make building exterior fire-resistant	
		Reduce risk of flooding	
Section 2. Bat access		Create new entrance (s)	
		Enlarge/reduce entrance (s)	
		Reduce light spillage at entrances/light sampling areas	
		Install light sampling feature (porch)	
		Install dormer	
		Increase vegetation cover outside entrance	
Section 3. Microclimate enhancements		Install black light baffle(s)	
		Block gaps	
		Build hot box(es)	
		Create hot compartment(s)	
		Create cool tower	
		Create cool room	

Section 3. Microclimate enhancements cont.	Create hibernacula	
	Install water dropping system	
	Provide alcoves/open chimney stacks	
Internal structure/materials	Remove non-bat friendly roof membrane	
	Install bitumen 1F felt membrane	
	Repair roof membrane	
	Unclutter flight areas	
	Remove droppings	
	Remove non-safe mesh	
	Fasten mesh securely	
	Install perches (different heights and areas)	
Surrounding Landscape	Plant/manage hedgerows/create habitat	
	Remove/modify sources of artificial light along flight paths	
	Manage fence lines/walls	
	Improve knowledge of additional roosts	
	Improve knowledge of habitat use	
	Research/solve issues with development	

Table to record results of the assessment for each section

Summary of improvement works — only complete this once Sections 1-5 have been evaluated and the results entered into the previous table.

The key considerations here are (1) stating the improvement work necessary for the longevity of the site as a bat roost and (2) identifying the knowledge gaps regarding key habitats for the colony. These should be categorised in terms of priority and where possible an approximate timeline and cost should be considered. Any limitations, such as the timing of work, should also be highlighted.

High priority Medium priority