From: James Mansfield <james.mansfield@somerset.gov.uk>
Sent: Wednesday, June 7, 2023 5:07 PM
To: Dawn deVries <dawn.devries@somerset.gov.uk>
Cc: Emily Kennett <emily.kennett@somerset.gov.uk>
Subject: 50/20/00054 - Combe Batch
Importance: High

Dear Dawn,

Habitats Regulations Assessment, NORTH SOMERSET MENDIP BATS

50/20/00054: Hybrid (full and outline) application. Full application for the erection of 30 No. dwellings and formation of access, associated open space, landscaping and parking. Outline application with some matters reserved for 4 No. self build plots.

On behalf of Somerset Ecology Services, please accept my apologies for the delay in responding to the amendments concerning the above application. SES have noted that a number of changes have been proposed by the applicant which are not reflected in the superseded HRA. Therefore, in accordance with requirements outlined by Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended), SES have undertaken an updated HRA to reflect these changes.

Our recommendations as a whole remain similar to those outlined in 2020, with some small changes concerning amended Replacement Bat Habitat requirements which are resultant from habitat changes on the receptor site. However, beyond this no changes to SES's previous recommendations are proposed, which were previously approved by Natural England (Darren Horn) on the 2nd of November 2020. SES also note that Natural England (James McGiveron) have provided a recent updated consultation response on the 6th of June 2023, concluding that as a result of the proposed amendments the proposals are unlikely to have a significant impact beyond the anticipated impacts of the original proposal.

Assuming you are happy with SES's recommendations, SES are happy to consult Natural England, or alternatively you may wish to do this directly.

Please note, this consultation response only considers impacts on the North Somerset and Mendip Bats SAC.

If you have any questions or require anything else, please let me know.

Kind regards

James

James Mansfield ACIEEM

Interim Principal (County) Ecologist

Somerset Council

M: 07960 335239

Conservation of Habitats and Species Regulations, 2017

HABITATS REGULATIONS ASSESSMENT

Stage 1: Habitats Regulations Assessment - Scree
European site

Part A: The proposal	
1. Type of permission/ activity:	Full
2. Application reference no:	50/20/00054
3. Site address:	Land At, Combe Batch, Wedmore, Somerset, BS28
4. Brief description of proposal:	Hybrid (full and outline) application. Full application for the erection of 30 No. dwellings and formation of access, associated open space, landscaping and parking. Outline application with some matters reserved for 4 No. self build plots.

Figure 1: Site Plan

The site is approximately 3 acres of grass land, rising gently from Combe Lane and descending to Little Owls Nursery on its eastern boundary. The site is located to the east of the village of Wedmore on the edge of the village and abuts the development boundary being separated by Combe Lane from the residential settlement at Combe

	Batch Rise, it is adjacent to Wells road B3139 on its southern boundary.[1]
Part B: The European site	
5. European site name(s), Qualifying Features:	**North Somerset and Mendip Bats SAC** • Greater Horseshoe Bat (*Rhinolophus ferrumequinum*) • Lesser Horseshoe Bat (*Rhinolophus hipposideros*) • Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); Dry grasslands and scrublands on chalk or limestone • Caves not open to the public • *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes **Mendip Woodlands SAC** • *Tilio-Acerion* forests of slopes, screes and ravines; Mixed woodland on base-rich soils associated with rocky slopes **Somerset Levels and Moor Special Protection Area (SPA)** • *Cygnus columbianus bewickii*; Bewick's swan (Non-breeding) • *Anas crecca*; Eurasian teal (Non-breeding) • *Pluvialis apricaria*; European golden plover (Non-breeding) • *Vanellus vanellus*; Northern lapwing (Non-breeding) • Waterbird assemblage **Somerset Levels and Moors Ramsar** The Somerset Levels and Moors are also a designated Ramsar site under the following criterion: Criterion 2 - Supports 17 species of British Red Data Book invertebrates Criterion 5 – Supports assemblages on international importance; species with peak counts in winter: 97,155 waterfowl (5-year peak mean 1998/99 to 2002/2003); and Criterion 6 – Species / populations occurring at levels of international importance including wintering Bewick's swan, Eurasian teal, and northern lapwing. Also, for possible future consideration as it supports significant populations of wintering mute swan, Eurasian wigeon, northern pintail, and northern shoveler.

[1] Anon. n/d. *Design and Access Statement for Proposed Residential Development on Land at Combe Batch, Wedmore, Somerset, BS28 4DX*. Property Link as submitted

6. Ecological characteristics associated with the features (including those associated with the site, and information on issues or sensitivities associated with the features if available).	**North Somerset and Mendip Bats SAC** Greater Horseshoe Bats Greater Horseshoe bat populations are sustained by a foraging habitat which consists primarily of permanently-grazed pastures interspersed with blocks or strips of deciduous woodland, or substantial hedgerows. Such pasture / woodland habitats can generate large levels of their favoured prey, especially moths and dung beetles, but also tipulids and ichneumonids.[2] Larger hedgerows are required for commuting as well as foraging by Greater Horseshoe bats. Continuous lines of vegetation of sufficient height and thickness to provide darkness when light levels are still relatively high are needed for commuting bats.[3] Lesser Horseshoe Bats '*The primary foraging habitat for Lesser Horseshoe bats is broadleaf woodland where they often hunt high in the canopy. However, they will also forage along hedgerows, tree-lines and well-wooded riverbanks*.'[4] Lesser Horseshoe bats are primarily a woodland feeding bat using deciduous woodland or mixed coniferous woodland and hedgerows. It has been found that landscapes that were most important contained a high proportion of woodland, parkland and grazed pasture, linked with linear features, such as overgrown hedgerows. Commuting corridors, such as tall bushy hedgerows, are important features for Lesser Horseshoe bats as they avoid crossing open areas and are vulnerable to the loss of these corridors. In Belgium no bat was recorded more than 1 metre from a feature. Stonewalls have been reported in use as commuting routes in Ireland.[5] Greater and Lesser Horseshoe Bat Research suggests that preferred commuting routes for Lesser Horseshoe bats are potentially disrupted from flying along hedgerows by introduced artificial light levels above 0.5 Lux. It was also found that continued disruption increased the effect, i.e. Lesser Horseshoe bats do not become habituated to the presence of artificial lighting. This would therefore permanently affect their behaviour possibly having a significant effect on use of flight lines accessing feeding areas. Lacking data to the

[2] Ransome, R. D. 1997. *The management for Greater Horseshoe bat feeding areas to enhance population levels*: English Nature Research Reports Number 241. Peterborough: English Nature.

[3] Ransome, R. D. 1996. *The management of feeding areas for Greater Horseshoe bats*. Peterborough: English Nature; Ransome, R. D. 1997. *The management for Greater Horseshoe bat feeding areas to enhance population levels*: English Nature Research Reports Number 241. Peterborough: English Nature

[4] Schofield, H. W. 2008. *The Lesser Horseshoe Bat Conservation Handbook*. Ledbury: The Vincent Wildlife Trust.

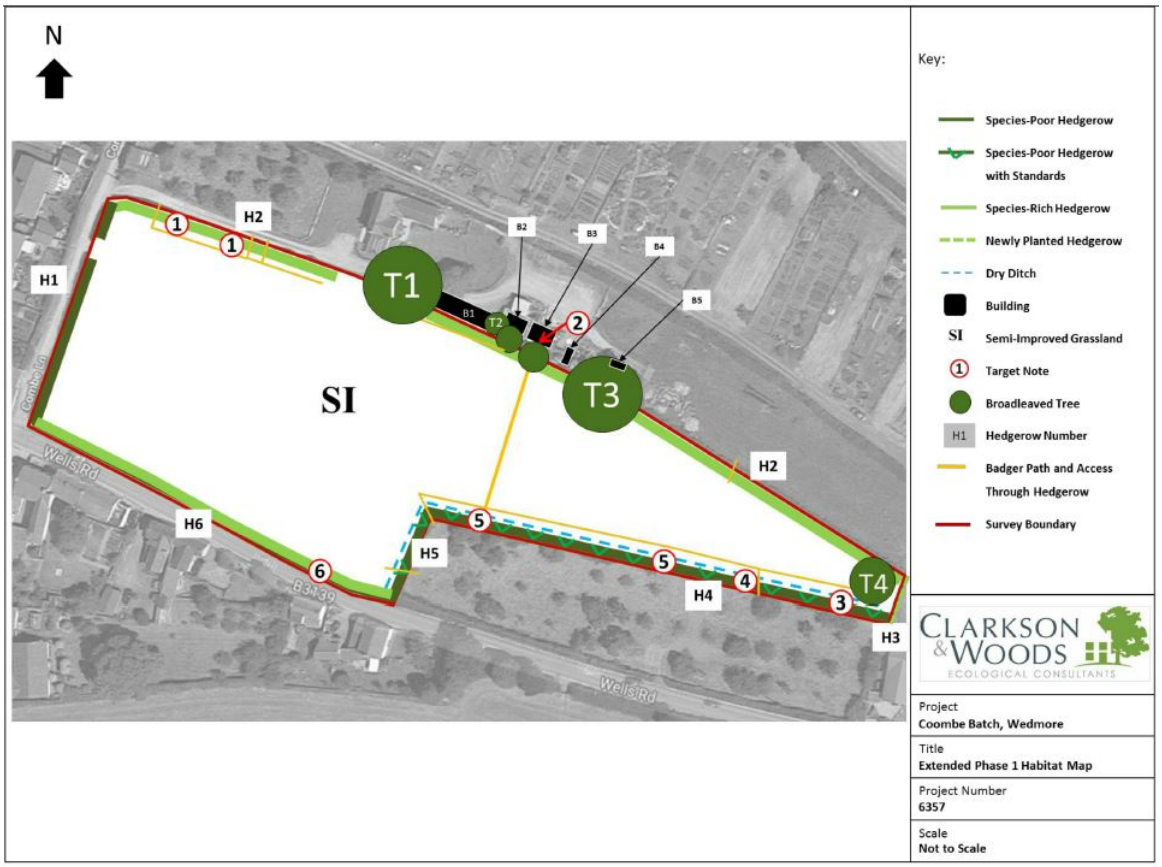
[5] Motte, G. & Libois, R. 2002. Conservation of the Lesser Horseshoe bat (*Rhinolophus hipposideros* Bechstein, 1800) (Mammalia: Chiroptera) in Belgium. A case study in feeding requirements. *Belg. J. Zool., 132 (1): 47-52;* Biggane, S. & Dunne, J. 2002. A study of the ecology of the lesser horseshoe colony at the summer roost in Co. Clare, Ireland. European Bat Research Symposium (9, 2002, Le Havre). Abstracts of presentations at the 9th European Bat Research Conference, August 26-30 at Le Havre, France. *Bat Research News* 43(3): 77.

	contrary it is considered that Greater Horseshoe bats would react in the same way and that introduced lighting from the application site could cause behavioral changes and present a barrier to movement. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) Grassland is sensitive to physical damage through lack of grazing resulting in scrub encroachment; physical damage through inappropriate scrub control; non-toxic contamination through nutrient enrichment (e.g. nitrogen deposition from air pollution); and biological disturbance through spread of invasive or introduced non-native species. It is also sensitive to increased trampling arising from access. *Tilio-Acerion* forests of slopes, screes and ravines Woodland is sensitive to physical damage through increased trampling arising from access.; biological disturbance through spread of *Chalara fraxinea* disease; and non-toxic contamination through atmospheric nitrogen deposition (e.g. air pollution). Caves not open to the public These are natural caves which are not routinely exploited for tourism, and which host specialist or endemic cave species. Several notable caves outside of the SAC are already exploited for tourism, these areas should not be extended into areas with cave decoration (such as stalactites and stalagmites) or bats. Elsewhere, sediment loading from ingress to the cave systems can damage interest features either directly or through the process of necessary removal/cleaning and should be reduced. Poor water quality and inadequate quantities of water can adversely affect the structure and function of this habitat type. **Mendip Woodlands SAC** *Tilio-Acerion* forests of slopes, screes and ravines Woodland is sensitive to physical damage through increased trampling arising from access.; biological disturbance through spread of *Chalara fraxinea* disease; and non-toxic contamination through atmospheric nitrogen deposition (e.g. air pollution). **Somerset Levels and Moors SPA / Ramsar** Wintering / Migratory Birds The availability of an abundant food supply is critically important for adult fitness and survival and the overall sustainability of the population. As a result,

	inappropriate management and direct or indirect impacts which could affect the distribution, abundance and availability of prey and hence adversely affect species' populations. The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population. This includes increased recreational pressure. <u>Aquatic Invertebrate Assemblage</u> The designated invertebrate assemblage is associated with the moorlands of Somerset Levels and Moors Ramsar Site, but also terrestrial habitat such as damp meadows and the network of small rhynes and ditches.
7. Ecological survey results for the application site:	An Ecological Impact Assessment of the application site was carried out by Clarkson Woods in February 2020[6]. An Extended Phase 1 Habitat Survey was conducted in April 2019. The majority of the application site contained semi-improved grassland used for cattle grazing. The sward was long, tussocky, unmanaged and relatively species rich. The semi-improved grassland field was bordered by a network of six hedgerows. With reference to Figure 2, Hedgerow 1 (H1) is species poor, managed and 1.2m high, but includes bramble and hawthorn; H2 is species rich, 1.2m high, gappy and includes hawthorn; H3 is newly planted; H4 is species poor with standard trees, is overgrown with a 5m long bramble gap with a ditch filled with ruderals; H5 is species poor with standard trees, unmanaged including hawthorn; and H6 is species rich, managed and adjacent to the B3151. Four sheds were present adjacent or directly adjacent to the application Site boundary, all along H2.

[6] Remazeilles, A. 2020. *Ecological Impact Assessment: Combe Batch, Wedmore, Somerset.* Blackford: Clarkson Woods

Figure 2: Phase 1 Habitat Map



The bat activity transect surveys involved walking a predetermined route at a constant speed using bat detectors and recording devices. The transect was designed to provide a balanced overview of bat activity across the entire application site. Three minute stop points were included at various pre-determined locations throughout the transect (12 stop points in total - Figure 3 below refers). Surveys were undertaken once per season (spring, summer and autumn) between May and September 2019. The surveys were carried out during evenings with suitable weather conditions (low wind, little to no rain and temperatures at least 10C). Surveyors were equipped with handheld bat detectors (Batbox Duet and Echo Meter Touch with an iPad Mini 4).The surveys commenced at sunset and finished between 2 and 3 hours after sunset.

Two automated static bat detectors (Wildlife Acoustics SM2+ or Titley AnaBat Swifts) were deployed within the application site once per season (spring, summer and autumn 2019) between May and September 2019 for a minimum of five consecutive nights per deployment. Detector locations were selected to focus on key habitat features identified during the surveys and habitats to be potentially affected by the development proposals. The detectors were programmed to begin recording at least 30 minutes before sunset
and end recording 30 minutes after sunrise each night and logged bat passes in each static detector location. The deployment dates and locations are detailed in Table 1 below.

Table 1: Static Detector Deployment

Season	Date deployed	Date collected	No. survey nights	Summary of weather conditions	Nightly temperature range (°C)
Spring	30/05/19	05/06/19	6	Occasional fog, predominantly scattered cloud. Light rain on the 04th of June 2019.	9°C - 15°C
Summer	04/07/19	10/07/19	6 at Location A 1 at Location B	Occasional fog, predominantly sunny and passing cloud. Light rain on the 07th of July 2019	8°C -16°C
Summer	15/07/19	22/07/19	7	Occasional fog, predominantly sunny and passing cloud. Light rain on the 18th and 19th of July 2019.	10°C - 18°C
Autumn	02/09/19	10/09/19	8 at Location A 6 at Location B	Occasional fog, predominantly passing cloud. Rain on the 04th of September 2019.	7°C - 16°C

Figure 3: Walked Transect Route (purple dashed line), Stop Points and Static Detector Location (yellow stars)

Typically, the transect surveys, which are poor at recording horseshoe bat activity only logged two passes of Greater Horseshoe bat in any of the transect surveys (2nd September 2019). A total of 29 Greater Horseshoe passes have been recorded by automated detectors, of which 17 were recorded in September at Location A. This species was recorded on every survey at Location A. Clarkson Woods considered that the importance of the application site to foraging Greater Horseshoe bats is likely to be relatively low given that no indication of hunting behaviour was recorded during either the transect surveys, or as a result of static detector surveys (foraging contacts as defined by Millers (2001) Activity Index). Foraging contacts for Greater Horseshoe were recorded in late June and September. The low level of recorded activity attributed to Greater Horseshoe bats throughout the surveys can therefore be categorised according to the SAC guidance as falling below the threshold of foraging. This indicates this species is primarily commuting through the application site at the time of survey.

Lesser Horseshoe bats were recorded in moderate numbers (a peak of 377 passes in total was recorded in September period at Location A), and this species was recorded in every survey, almost exclusively at Location A (only six passes at Location B in September). Lesser Horseshoe bats (as defined in the SAC guidance) were recorded hunting in September at Location A. The application site's importance to foraging lesser horseshoe bats is likely to vary seasonally, as found elsewhere. Typically, the transect surveys, which are poor at recording horseshoe bat activity, only recorded Lesser Horseshoe bats in September. Three passes of this species were recorded approximately 30 minutes after sunset, which suggests roosts may be present within the close vicinity to application site (as confirmed within the desk study). Given the proximity of a roost site it is likely that the application site forms the part of an individual's territory used by one Lesser Horseshoe bat.

It was noted during evening bat surveys that light levels within the south-west of the Site were high with artificial light spill from adjacent streetlights. As borne out by the bat activity surveys these significantly decrease the suitability of this part of the application site for some foraging and commuting bats considered to be light-averse species.

Figure 4: Approximate Lit Area (yellow) and Locations of Streetlamps (blue crosses)

A number of sheds were present along the northern boundary of the application site. These sheds were identified as having 'low' to 'moderate' potential to support roosting bats. All of these sheds were located outside the proposed development site and will be retained.

Clarkson and Woods Ltd. was commissioned by Coln Residential to carry out an updated Ecological Impact Assessment[7].

Two automated static bat detectors were deployed within the Site during spring, summer and autumn and left for a minimum of five nights to record bat activity.

Two automated static detectors (Titley AnaBat Swifts) were deployed within the Site once per season (spring and summer 2022) between April and July 2022 (update surveys) for a minimum of ten consecutive nights per deployment. Four automated static detectors (Titley AnaBat Swifts) were deployed within the RBH (Scoping Bat Survey at Rug Hill) for a minimum of ten consecutive nights per deployment in July 2022. Detector locations were selected to focus on key habitat features identified during the surveys and habitats to be potentially affected by the development proposals. The detectors were programmed to begin recording at least 30 minutes before sunset and end recording 30 minutes after sunrise each night and logged bat passes in each static detector location. The deployment dates and locations are detailed below in Table 2.

Table 1: Static Detector Deployment for Updated Surveys (2022)

Season	Date deployed	Date collected	No. survey nights	Summary of weather conditions	Nightly temperature range (°C)
Update Spring	26/04/2022	06/05/2022	10	Occasional fog or drizzle, predominantly passing cloud. Temperature drop on the night of 29th April 2022.	-1°C - 17°C
Update Summer	04/07/2022	14/07/2022	10	Occasional fog, predominantly clear.	7°C - 26°C
Scoping Bat Survey at RBH (Rug Hill)	04/07/2022	14/07/2022	10	Occasional fog, predominantly clear.	7°C - 26°C

Figure 5: Walked Transect Route (purple dashed line), Stop Points and Static Detector Location (yellow stars) Updates survey (2022)

[7] Remazeilles, A. 2022. *Ecological Impact Assessment: Combe Batch, Wedmore, Somerset*. Blackford: Clarkson Woods

Results of the 2022 update transect are broadly in line with the 2019 transect. Lesser and greater horseshoe bats were again recorded in very small numbers and observed commuting only at the Site. No records were recorded in April; and one record was recorded in July for lesser and greater horseshoe bats respectfully.

A total of 14 Greater Horseshoe passes have been recorded by automated detectors, of which 10 were recorded at Location A. Clarkson Woods maintained their position and considered that the importance of the application site to foraging Greater Horseshoe bats is likely to be relatively low given that no indication of hunting behaviour was recorded during either the transect surveys, or as a result of static detector surveys (foraging contacts as defined by Millers (2001) Activity Index). The low level of recorded activity attributed to Greater Horseshoe bats throughout the surveys can therefore be categorised according to the SAC guidance as falling below the threshold of foraging. This indicates this species is primarily commuting through the application site at the time of survey.

Lesser Horseshoe bats were recorded in low-moderate numbers (a total of 51 passes, all passes associated with Location A). The application site's importance to foraging lesser horseshoe bats is likely to vary seasonally, as found elsewhere. Typically, the transect surveys, which are poor at recording horseshoe bat activity, only recorded a single Lesser Horseshoe bat in July. As outlined previously in the superseded HRA, roosts may be present within the close vicinity to application site (as confirmed within the desk study). Given the proximity of a roost site it is likely that the application site forms the part of an individual's territory used by one Lesser Horseshoe bat.

Part C: Screening assessment for likely significant effect	
8. Is this application	No

necessary to the management of the site for nature conservation? If the answer to Q9 is 'Yes' then go directly to the end of the form. Permission may be granted.	
9. The identified ways in which the Qualifying Features of the European site could be affected by the proposal	**<u>North Somerset and Mendip Bats SAC</u>** **Horseshoe Bats** a) <u>Loss / degradation of foraging habitat</u> Loss or degradation of foraging habitat resulting in a reduction in food availability, particularly through loss of pasture and woodland but also other prey supporting habitats. b) <u>Severance of flight lines</u> Larger hedgerows are required for commuting by Greater and Lesser Horseshoe bats. Continuous lines of vegetation of sufficient height and thickness provide darkness when light levels are still relatively high are needed for commuting bats to access hunting territories from roost sites. c) <u>Operational light disturbance</u> Greater and Lesser Horseshoe bats are sensitive to introduced lighting which has the potential to adversely affect their behaviour in such a way that it can prevent onward flight and disrupt access between the roost and traditional hunting territories. **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)** This habitat is present to the north of Cheddar Complex Component site approximately 7.25km to the north of the application site. There is potential for the

	loss and /or degradation of limestone grassland habitat caused by trampling due to increased access arising from visitors. ***Tilio-Acerion* forests of slopes, screes and ravines** The component site is in North Somerset and is considered to remote for an affect from the proposed development to occur and is not considered further in this assessment. **Caves not open to the public** The component site is considered to remote for an affect from the proposed development to occur and is not considered further in this assessment. **Mendip Woodlands SAC** ***Tilio-Acerion* forests of slopes, screes and ravines** This habitat is present in the Rodney Stoke Woods component site approximately 5.4km, as the crow flies, to the northeast of the application site. There is potential for the loss and /or degradation of woodland habitat caused by trampling due to increased access arising from visitors. **Somerset Levels and Moors SPA / Ramsar** a) Overwintering and Migratory Birds The application site consists of an enclosed field surrounded by hedgerows and orchard, which is considered very unlikely to support the habitat requirements of migratory and over wintering birds feature of the SPA and Ramsar sites. The nearest component of the SPA / Ramsar site is 2.5km to the south. It is considered that there is no pathway for these features to be affected by the proposed development. The features are not considered further in the assessment, b) Ramsar Aquatic Invertebrates As the proposed development would increase the number of residents into the area it is likely that wastewater output would result thereby increasing phosphates into watercourses connected to the Somerset Levels and Moors Ramsar. However, the location of the application site is north of the Isle of Wedmore within the River Axe catchment and is not hydrologically linked downstream to the Somerset Levels and Moors Ramsar. Therefore, there is no pathway for phosphates from the proposed development to affect nutrient levels in watercourse in the Somerset Levels and Moors Ramsar. The features are not considered further in the assessment.

10. Assessment of risks without avoidance or reduction measures	**<u>North Somerset and Mendip Bats SAC</u>** **Horseshoe Bats** <u>Loss / degradation of foraging habitat</u> *Greater Horseshoe Bats* The majority of the application site contained semi-improved grassland used for cattle grazing. The sward was long, tussocky, unmanaged and relatively species rich. In May the preferred key prey for adult Greater Horseshoe bats is the cockchafer. In the absence of sufficient key prey, bats switch to secondary prey such as tipulids, caddis flies and the ichneumonid *Ophion*. As a last resort they eat small dipterans.[8] Given the current use of the field it is unlikely that there is an abundance of these species present on the application site in early summer. In June and early July, pregnant females feed on moths, their key prey at that time, and continue to do so after giving birth, until late August. They usually avoid dung beetles even when they are abundant, as long as moths are in good supply. If both are in poor supply, they switch to summer chafers. However, the grassland field is currently grazed and is unlikely to produce an abundance of moth species. Grazing has been shown to have a detrimental effect on moth abundance. However, the hedgerows, particularly large hedgerows H4 and H5 around the orchard on the southeast of the application site, might provide some resource. Moth supplies usually fall steadily in August and September, due to phonological population declines, or rapidly at a particular dawn or dusk due to temporary low temperatures. If either happens adult bats switch to secondary, single prey items, or combine moths with them. Tipulids are often the first alternative, but the dung beetle *Aphodius rufipes* is also taken. As the application site is used by grazing cattle dung beetles are likely to be present on the application site. Greater Horseshoe bats also feed through the winter when prey species become active, for example when *Ophian* wasps swarm in woodlands above 5˚C. They have been found to spend significant times in woodland, being sheltered, often warmer at night, and insects are much more abundant than in open fields. However, the application site is remote from Greater Horseshoe bat wintering sites and therefore the proposed development is unlikely to have a significant effect on the species in the hibernation period.

[8] Ransome, R. D. 1997. *The management for Greater Horseshoe bat feeding areas to enhance population levels*: English Nature Research Reports Number 241. Peterborough: English Nature; Ransome, R. D. & Priddis, D. J. 2005. *The effects of FMD-induced mass livestock slaughter on greater horseshoe bats in the Forest of Dean.* English Nature Research Reports Number 646. Peterborough: English Nature.

Therefore, there is a potential risk of loss and or degradation of habitat supporting prey species hunted by Greater Horseshoe bats.

Lesser Horseshoe Bats

Due to their small body size Lesser Horseshoe bats cannot cope with large prey, such as cockchafers. By comparison they eat smaller moth species than the Greater Horseshoe bat. The principal prey species for Lesser Horseshoe bats, using data collected at Hestercombe House SAC are from the Diptera and Lepidoptera families. At this location there were seven major prey categories comprised over 70% of the diet: Tipulidae (crane flies), Anisopodidae (window gnats), Lepidoptera (moths), Culicidae (mosquitoes), Hemerobiidae (brown lacewings), Trichoptera (caddis flies) and Ichneumonidae (ichneumon wasps)[9]. Dung flies are also eaten[10].

Downs et al (2016)[11] identified a preference for woodland habitats above all others, particularly broadleaf woodland. Wet broadleaf woodland was used for foraging by five of the thirteen tracked bats. Parkland, grazed grassland and un-grazed grassland were also selected.

The application site consists of a grassland field which was used for grazing cattle. Therefore, potentially yellow dung fly is present and hunted by Lesser Horseshoe bats when cattle are present. In addition, although grazing is likely to suppress numbers, the larger hedgerows may support some abundance of micromoths. Tipulids are unlikely to be present in any abundance.

There is a potential risk of loss and or degradation of habitat supporting prey species hunted by Lesser Horseshoe bats.

<u>Operational light disturbance</u>

There is a risk that lighting from the proposed development, would raise illuminance levels to cause an adverse effect on Greater and Lesser Horseshoe bat behaviour both around the application site preventing access to prey resource.

In addition, many night flying species of insect are attracted to light, especially those lamps that emit an ultra-violet component and particularly if it is a single light source in a dark area. As well as moths and cockchafers, a key prey item for Greater Horseshoe bats, a range of other insects can be attracted to light such as crane flies, a secondary prey species for Lesser Horseshoe bats. In addition, it is

[9] Boye, P. & Dietz, M. 2005. English Nature Research Reports Number 661: *Development of good practice guidelines for woodland management for bats*. Peterborough: English Nature; Knight Ecology. 2008. *Hestercombe House, Taunton, Somerset: Lesser Horseshoe bat Diet Analysis*. Clutton: Knight Ecology

[10] Cresswell Associates. 2004. *Bats in the Landscape Project*. The National Trust, Sherborne Park Estate

[11] Downs, N. C., Cresswell, W. J., Reason, P., Sutton, G., Wells, D. & Wray, S. 2016. Sex-Specific Habitat Preferences of Foraging and Commuting Lesser Horseshoe Bats Rhinolophus hipposideros (Borkhausen, 1797) in Lowland England. *Acta Chiropterologica* 18(2), (1 December 2016)

	also thought that insects are attracted to illuminated areas from further afield. This is thought to result in adjacent habitats supporting reduced numbers of insects. This is a further impact on the ability of the light avoiding bats to be able to feed.[12] **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)** Calcareous grassland is present to the north of application in the Cheddar Gorge complex. This is over 7.25km to the north of the application site as the crow flies. There is potential for the loss and /or degradation of limestone grassland habitat caused by trampling due to increased access arising from visitors. However, there are no direct footpaths and access from the site is likely to be via car through the village of Cheddar. Given the size of the development and the distance from the feature it is considered use is only likely to be on occasion by a few residents and therefore there would be no risk to the feature. **<u>Mendip Woodlands SAC</u>** ***Tilio-Acerion* forests of slopes, screes and ravines** Rodney Stoke Woods are approximately 5.4km to the northeast of the application site as the crow flies. There is potential for the loss and /or degradation of woodland habitat caused by trampling due to increased access arising from visitors. However, the woodland is located on the far side of the A371 and village and thence uphill via Scaddens Lane from the application site. There are no rights of way through the woodland. Given the location and size of the development and the availability of more well-known visitor attractions it is considered that there is no risk to the SAC woodland.
11. Conclusion of Screening stage (Is the proposal likely to have a significant effect	**Alone:** **<u>Horseshoe Bats</u>** <u>Loss / degradation of foraging habitat</u> The SAC Greater Horseshoe bat maternity roost is within the Cheddar Complex component site caves is approximately 6.7km to the north of the application site. There are other Greater Horseshoe bat roosts closer to the proposed development site which are considered functionally linked to the maternity site in Cheddar

[12] Institute of Lighting Engineers/ Bat Conservation Trust. 2018. *Guidance Note 08/18 Bats and artificial lighting in the UK.*

'alone' or 'in combination' on a European site?)	Gorge.[13] For example the closest roost, a maternity roost was recorded in 2016, approximately 1.5km southwest of the application site. In a radio tracking study, it was observed although Greater Horseshoe bats foraged together near the roost site at a distance bats were never observed to arrive at or leave a foraging area together (Rossiter et al, 2002[14]). This study also showed that there were spatial associations between females and their adult daughters, which shared both foraging grounds and night roosts. This indicates that female greater horseshoe bats have individual foraging territories which are passed on to their daughters. Individual greater horseshoe bats use several foraging areas of 6 to 7 hectares with localised feeding spots of about 0.35 hectares (Ransome, 2008[15]). The application site is approximately 1.2ha in area. Given the distance from the maternity roost to the southwest it is probable that Greater Horseshoe bat activity is territorial on the application site, i.e. the application site is likely to form part of a commuting route to foraging area for a single individual with hunting within a larger territory occurring seasonally. Greater Horseshoe bats hunt in different areas at different times of year according to the availability of seasonal prey. The application site is unlikely to provide significant prey resources in the period between May and August/September when *Melolontha* and moths are hunted by female Greater Horseshoe bats. Although larger hedgerows may provide some abundance of moths most hedgerows are over managed, so numbers are likely to be low. The occasional presence of cattle may provide *Aphodius* dung beetles, which are hunted from late summer and into autumn. The proposed development would result in the cessation of grazing and hence loss of dung beetles and as most hedgerow forms the boundary of back gardens uncertain management is likely to reduce prey from this source. There is a large Lesser Horseshoe bat maternity roost at Owley, Bradley Cross about 6.4km to the north of the application, which is considered to functionally support the SAC hibernation sites for the species. This supports approximately 300 individuals. However, the application site lies beyond the home range of this population. A maternity roost of about 100 Lesser Horseshoe bats, however, has been recorded in 1997, approximately 1.76km southeast of the application site in Theale. It is likely that the SAC hibernation roosts in the Mendips are used by Lesser Horseshoe bats from this population and therefore are the roost is considered functionally linked.

[13] Jones, Dr. G. & Billington, G. 1999. *Radio tracking study of Greater Horseshoe bats at Cheddar, North Somerset*. Taunton: English Nature.

[14] Rossiter, S. J., Jones, G., Ransome, R. D. & Barratt, E. M. 2002 Relatedness structure and kin-based foraging in the greater horseshoe bat (*Rhinolophus ferrumequinum*). *Behav. Ecol. Sociobiol.* (2002) 51: 510-518

[15] Ransome, R. D. 2008. Greater horseshoe bat *Rhinolophus ferrumequinum*: in Harris, S. & Yalden, D. W. (eds.) 2008. *Mammals of the British Isles: Handbook, 4th Edition*. Southampton: The Mammal Society.

	In Bavaria individual female Lesser Horseshoe bats were recorded using up to 7 different foraging areas over three nights. The size of foraging area varied between 3.6 and 18.2ha [mean 8.4ha][16]. These are likely to include within them localised hunting spots for individual bats on the application site. Radio-tracking carried out by Dr Tessa Knight suggests that Lesser Horseshoe bats generally have individual territories with relatively small overlap[17]. Potentially dung flies are available as prey to Lesser Horseshoe bats, according to the presence of cattle and the availability of micromoths in the summer/ early autumn. Given the distance from maternity populations the site is likely to form part of a territory used by one individual. The proposed development would result in the cessation of grazing and hence loss of dung flies and as most hedgerow forms the boundary of back gardens uncertain management is likely to reduce prey from this source. <u>Severance of flight lines</u> Over managed Hedgerow 6 would be lost along the southern boundary to facilitate the access road to the proposed development. This is currently affected by street lighting. Elsewhere the hedgerows would be retained. However, these largely form the boundaries of back gardens and would be subject to management by future residents which degrade their potential as commuting structure. Furthermore, the structure would be further disturbed by garden boundary fences and incidental lighting (see below). Therefore, the boundary hedgerows are likely to cease to function as regular commuting structure. <u>Operational light disturbance</u> Part of the application site is currently affected by street lighting. Activity surveys indicate that this has displaced horseshoe bats from using the southwest part of the field. Research suggests that preferred commuting routes for Lesser Horseshoe bats are at lux levels even lower than previously thought: "*under natural, unlit conditions … 0.04 lux*" [18] but avoid levels above 3.6 Lux. (Stone et al, 2009)[19] They regularly use dark hedgerows which are an average of 0.45 Lux. Stone et al (2009) stated, '*It is unsurprising that few bats flew along the unlit side of the hedge, given that light levels on the unlit side on* [artificially] *lit nights (mean 4.17 lux) were significantly*

[16] Holzhaider, J., Kriner, E., Rudolph, B-U. & Zahn, A. 2002. Radio-tracking a Lesser Horseshoe bat (Rhinolophus hipposideros) in Bavaria: an experiment to locate roosts and foraging sites. *Myotis,* 49, 47-54; Dietz, C., von Helverson, O. & Nill, D. 2009. Bats of Britain, Europe and Northwest Africa. London: A & C Black Publishers Ltd

[17] Pers. Comm. Dr Tessa Knight, January 2011

[18] Stone, E.L 2013. *Bats and Lighting – Overview of current evidence and mitigation.* Bristol: University of Bristol.

[19] Stone, E. L. 2009. The impact of street lighting on lesser horseshoe bats *Presented at the South West Bat Conservation Trust Conference, 25 April, 2009*; Stone, E. L., Jones, G. & Harris, S. 2009. Street Lighting Disturbs Commuting Bats. *Current Biology 19, 1123–1127, July 14, 2009*

	higher than those along dark hedges (mean 0.45 lux); even these relatively low light levels may make established routes unsuitable for commuting.' They are potentially disrupted from flying along hedgerows by introduced artificial light levels above 0.5 Lux. It was also found that continued disruption increased the effect, i.e. Lesser Horseshoe bats do not become habituated to the presence of artificial lighting. This would therefore permanently affect their behaviour possibly having a significant effect on use of flight lines accessing feeding areas. Lacking data to the contrary it is considered that Greater Horseshoe bats would react in the same way. In addition, prey resource may be reduced due to attraction lighting, both external and internal, placing them out of reach if light sensitive horseshoe species. No lighting plan has been submitted with the application. It is assumed that visitors would also bring lighting to illuminate their pitches at night. Therefore, it must be concluded that there is a risk of lighting causing a significant effect on both species of horseshoe bats. **Conclusion:** An Appropriate Assessment of the proposed development is required due to the effects of loss of foraging habitat, degradation of flight structure and introduced lighting having an adverse effect on the activity of horseshoe bats from the North Somerset and Mendip Bats SAC.
Stage 2: Habitats Regulations Assessment – Appropriate Assessment	
Part D: Appropriate Assessment **NB:** In undertaking the appropriate assessment, the LPA must ascertain whether the project would adversely affect the integrity of the European site. The Precautionary Principle applies, so to be certain, the authority should be convinced that no reasonable scientific doubt remains as to the absence of such effects. The Appropriate Assessment considers the impacts on the integrity of the international site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of potential mitigation is carried out to determine if there is an overall adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects, then development consent can only be given if stages 3 and 4 are followed.	
12. Conservation Objectives	**North Somerset and Mendip Bats SAC** The conservation objectives for the North Somerset and Mendip Bats SAC with regard to the natural habitats and/or species for which the site has been designated avoid the deterioration of the qualifying natural habitats and the habitats of

	qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features. These include, subject to natural change, to maintain or restore: • The extent and distribution of qualifying natural habitats and habitats of qualifying species • The structure and function (including typical species) of qualifying natural habitats • The structure and function of the habitats of qualifying species • The supporting processes on which… the habitats of qualifying species rely • The populations of qualifying species, and, • The distribution of qualifying species within the site.
13. Effects on those Conservation Objectives of the European Site affected by the proposal	<u>The extent and distribution of qualifying natural habitats and habitats of qualifying species</u> There is likely to be direct loss of habitat providing seasonal prey species and degradation of habitat, hedgerows, through urbanisation and indirectly through displacement of prey from introduced artificial lighting and potentially through unacceptable management by future residents. <u>The structure and function of the habitats of qualifying species</u> Introduced lighting and urbanisation could potentially affect the function of retained hedgerows and other habitat on site and is likely prevent or reduce access around and within the application site by increasing illumination above levels likely to cause disturbance to commuting Greater Horseshoe bats and their prey. <u>The populations of qualifying species</u> Given the high level of activity recorded on the application site it is likely that individuals associated with the SAC population of Greater Horseshoe bats would be affected by the proposed development. It is considered that the proposed development unlikely to affect more than 1% of the wintering Lesser Horseshoe bat populations of the SAC, although this cannot be certain. It is estimated that about 15% of Lesser Horseshoe bats in maternity colonies, all non-designated, in the area of the SAC (Sedgemoor, Mendip and North Somerset) use designated hibernation roost sites. The rest are found in non-designated hibernation roosts.

14. Information on general trends if available.

With regard the Greater Horseshoe bat population in the summer maternity period in May 1999 (Jones & Billington, 1999[20]) there were less than 100 individuals when the radio tracking was carried out. In June 2013 about 50 Greater Horseshoe bats were present. A further 19 were observed in August, including females with dependent young. (Rush & Billington, 2013[21])

There are no regular annual summer counts of bats at the Cheddar Complex maternity roost and therefore the trend in the Cheddar component maternity population is not known. It is assumed that the population is less than 100 individual Greater Horseshoe bats in the Cheddar Complex SSSI component.

There is a maternity roost at Little Ireland in Wedmore, numbers of individuals unknown, which is possibly subsidiary to the Cheddar maternity roost[22]. The trend in this roost is not known.

Table 2: Wintering Horseshoe Bat Numbers February 2013[23]

Cave		Greater Horseshoe Bats	Lesser Horseshoe Bats
Gough's Cave	Electricity cupboard	-	5
	Entrance to bottom of Heartbreak Hill	-	5
	Milk Cave to Oxbow	-	27
Gough's Old Cave		+650	17
Saye's Hole		-	7
Great Oone's Hole		?	?
Long Hole		?	?
TOTAL		**650+**	**61**

During the hibernation period in February 2009 there were 427 Greater Horseshoe bats present. (pers. comm. Bob Corns, Natural England)) The latest available figures for Horseshoe bats winter roosting in the Cheddar Complex component site are from 2013. It is considered by Natural England that numbers are stable (pers. comm. Bob Corns, Natural England, email 03/08/2015). The figures for 20 February 2013 are as above. No roost count figures have been obtained since 2013 and therefore the trend in the winter population is not known.

[20] Jones, Dr. G. & Billington, G. 1999. *Radio tracking study of Greater Horseshoe bats at Cheddar, North Somerset*. Taunton: English Nature.

[21] Rush, T. & Billington, G. 2013. *Cheddar Reservoir 2: Radio tracking studies of greater horseshoe and Lesser Horseshoe bats, June and August 2013*. Witham Friary: Greena Ecological Consultancy

[22] Somerset Environmental Records Centre data

[23] Unable to reach Long Hole and Great Oone's Hole to do February Bat Count because caving Instructor carrying an injury. Gough's Old Cave higher count of Greater Horseshoe bats in February since it was much colder than January, the bats were in torpor and easier to count. The Greater Horseshoe bats in Gough's Old Cave were quite active and Jon Hill wanted to keep disturbance to a minimum- hence possibly undercounting

	The SAC is also designated for its Lesser Horseshoe bat hibernation sites. These would be dependent on the maintenance of the summer population. There is a large Lesser Horseshoe bat maternity roost at Owley, 3.4km north of the application site outside the boundaries of the SAC. This supports approximately 300 individuals. In addition, based on the survey results it is considered that there is another Lesser Horseshoe bat roost in close proximity to the application site of unknown location, but possibly that at Theale and abundance that is also potentially forms part of the SAC population. Cheddar caves are not used in the summer period. However, the trend in their population, and what relationship these bats bear to the hibernation roosts in the Cheddar complex and the other hibernation sites within the North Somerset and Mendip Bats SAC generally is not known. It is estimated that about 15% of Lesser Horseshoe bats in maternity colonies, all non-designated, in the area of the SAC (Sedgemoor, Mendip and North Somerset) use designated hibernation roost sites. The rest are found in non-designated hibernation roosts.
15. Assessment on the integrity of the European site's conservation objectives	<u>The extent and distribution of qualifying natural habitats and habitats of qualifying species</u> There would be direct loss of habitat providing seasonal prey species and degradation of habitat, hedgerows, through urbanisation and indirectly through displacement of prey from introduced artificial lighting and potentially through unacceptable management by future residents. This is likely to affect at least one individual of either species of horseshoe bat using the field as part of an exclusive territory (except when with juveniles). Given that there is no data on population trend it must be assumed that there would be an effect, without mitigation, on the integrity of SAC's conservation objectives. <u>The structure and function of the habitats of qualifying species</u> The whole of the application site would be developed resulting in loss of grassland habitat and cessation of grazing. Cattle provide dung beetles which are hunted by Greater Horseshoe bats in late summer and autumn and juveniles in their early forays. This resource may be lost and or displaced by the development. Hedgerows would be compromised by back gardens and infrastructure rendering them unviable for foraging horseshoe bats. Given the trend in the horseshoe bat populations is not known it must be assumed without mitigation that there would be an effect on the integrity of the SAC's conservation objectives. <u>The populations of qualifying species</u> Given the distance from subsidiary roost sites it is likely that the fitness of individuals associated with the SAC populations of horseshoe bats would be affected by the proposed development. Given that there is no data on population

	trend it must be assumed that there would be an effect on the integrity of the population without mitigation.

16. Assessment of effects taking account of avoidance or reduction measures included in the proposal

Aspect of project which will be potentially damaging	**Avoidance and mitigation measures included in the proposal (and any additional measures required for inclusion in the proposal) At both Construction and Operational Phases**	**Secured by**	**Residual effects**
Loss of foraging habitat and severance of flightlines	It is proposed to mitigate the loss of habitat used by Greater Horseshoe bats an area at Rug Hill, Crickham will be enhanced to act as replacement habitat for that lost. The approximate centre of the reserve is at Ordnance Survey Grid Reference ST 43774 49908. The area of land proposed lies adjacent to Rug Hill Private Nature Reserve. The reserve is located approximately 2km south of the Site and is 4.7ha in size. The HEP calculations returned a figure of 0.26ha of required compensation habitat, comprising optimal, high quality and well-managed replacement habitat, for greater horseshoes. To meet this area, approximately 0.129ha of species-rich long sward neutral grassland and 0.620ha of broadleaved woodland are proposed within the field to the south of the existing fence line. This Bat Replacement Habitat will also include the creation of two new ponds to be created and planted with marginal vegetation species and the banks seeded with a species-rich damp grassland mix. The improved grassland field to the north of the existing fence line will be grazed every	S106	Potentially some localised effects to individuals at the locale of the application site due to territorial behaviour

	year during winter and managed as long grassland during summer. In total, an area of approximately 2.5ha of Bat Replacement Habitat will be provided. This habitat, in addition to newly created habitat on Site, is worth an equivalent of 1.49ha of greater horseshoe foraging habitat. This satisfies the level mitigation habitat required by the HEP calculations for greater horseshoes (+0.00 equivalent hectares). In order to ensure that the replacement habitat is managed for horseshoe bats for the duration of the development a Landscape and Ecological Management Plan will be required.	Condition	None predicted
Operational Light Disturbance	It is considered that external lighting and light spill can be controlled by a condition, so that horseshoe bats are not affected further than current constraints by the planned development in areas bordering the application site and in order to control any further installation of lighting post development.	Condition	None predicted
17. Does the proposal have potential for in-combination effects with other plans or projects individually or severally	The proposed developments are considered not to act in combination with other planning applications in the areas administered by Mendip and Sedgemoor District Councils. As horseshoe bats are individually territorial development in the area of the application site is unlikely to significantly affect bats using habitat around Cheddar and along the Mendip scarp.		
Part E: Conclusion			
18. Natural England			

consultation response	
19. List of mitigation measures and safeguards to be covered by planning obligations (conditions or S106)	• A minimum accessible habitat enhancement area for horseshoe bats of 2.5ha shall be provided at Rug Hill (OS Grid Refernce ST 43774 49908). The replacement habitat shall be of long sward meadow, scrub and woodland. The siting and extent shall be agreed as part of the layout Reserved Matters. The layout of and a planting schedule for the habitat creation / enhancement of this open space will be submitted to and agreed with the local planning authority prior to work commencing on site. This enhancement will be planted at the earliest feasible date following permission unless otherwise agreed with the local planning authority • A Landscape and Ecological Management Plan (LEMP) for Rug Hill shall be submitted to, and be approved in writing by, the local planning authority prior to construction above damp-proof course level. The content of the LEMP shall include the following. a) Description and evaluation of features to be managed. b) Ecological trends and constraints on site that might influence management. c) Aims and objectives of management. d) Appropriate management options for achieving aims and objectives. e) Prescriptions for management actions. f) Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period). g) Details of the body or organization responsible for implementation of the plan. h) On-going monitoring and remedial measures. The LEMP shall also include details of the legal and funding mechanism(s) by which the long-term implementation of the plan will be secured by the developer with the management body(ies) responsible for its delivery. The plan shall also set out (where the results from monitoring show that conservation aims and objectives of the LEMP are not being met) how contingencies and/or remedial action will be identified, agreed and implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme. The approved plan will be implemented in accordance with the approved details. • Prior to construction above damp-proof course level, a “lighting design for bats” shall be submitted to and approved in writing by the Local Planning Authority. The design shall show how and where external lighting will be installed (including through the provision of technical specifications) so that

	it can be clearly demonstrated that areas to be lit will not disturb or prevent bats using their territory. All external lighting shall be installed in accordance with the specifications and locations set out in the design, and these shall be maintained thereafter in accordance with the design. Under no circumstances should any other external lighting be installed without prior consent from the Local Planning Authority.
20. Will the proposed development have an adverse effect on integrity?	Somerset Council consider that the proposed development is unlikely to have an adverse effect on the integrity of the North Somerset and Mendip Bats SAC, provided the mitigation measures are conditioned or subject to a s106 agreement.
Author:	Larry Burrows MCIEEM, Senior Ecologist, Somerset County Council (11/09/2020) Updated by James Mansfield, ACIEEM, Interim Principal Ecologist, Somerset Ecology Services.
Date:	11th September 2020 **Updated:** 7th of June 2023

Appendix 1: Habitat Evaluation

To check the amount of habitat needed to replace the value of that loss to Greater Horseshoe bats due to the proposed development and that no likely significant effect to the integrity of the SAC would occur the metric within the Technical Guidance on the Mendip District Bat SACs is used.

The Integrated Habitat System coding is used as a base in applying scores to a species' Habitat Suitability Index (HSI). The Integrated Habitat System (IHS)[24] classification comprises over 400 coded habitat categories, the majority drawn from existing classifications.

The Habitat Evaluation Procedure is structured around the calculation of Habitat Units (HU), which are the product of a Habitat Suitability Index (quality) for a species and the total area of habitat (quantity) affected.

In constructing an HSI for a species the index scores are applied to each Habitat and Matrix, and Formation and Land Use / Management codes in the Integrated Habitat System (IHS) based on analysis of the ecological requirements, from existing literature and professional judgement, for each species assessed or mapped. A database of Habitat Suitability Indices is kept by Somerset County Council and those for bat species are being validated by the Bat Conservation Trust, who supports the method as a way of determining habitat replacement for bats.

Each IHS 'Habitat' code will be scored on a scale of 0 to 6 using a potential or precautionary approach as a starting point. The score will be the same across each of the hierarchical levels of the IHS Habitat coding (e.g. poor is scored as 1 whether this is at broadest habitat level or priority habitat level unless there are discernible differences in the type of habitat used, e.g. oak or beech woodland. This means that the full range of scoring is used before the modifiers (the IHS matrix, formation and management codes) are applied.

However, there are exceptions to this approach for certain broad habitat types which are avoided by a species. For example, where arable land is generally avoided but where arable margins provide habitat that is exploited by a species. In this case if arable habitat is scored at its highest level the resulting mapping would give a false impression of the value of habitats available to that species across a landscape when mapped. Therefore, the broad habitat is avoided it would be scored 0 at the broadest habitat level and a higher score, say 2 or 3, for the sub code. Where a habitat is considered to be avoided this is clearly noted in the HSI for the species scored.

[24] http://www.somerc.com/integrated+habitat+system/

Matrix Codes[25] are added to or subtracted from the Habitat Code to a maximum score of 6, e.g. grassland score 3 + scrub score 2 would equal 5.

All other Codes are scored as a decimal 0 to 1 according to the effect the formation and /or management of a habitat has on its suitability. These are multipliers. Where there is no effect from Formation or Management codes then a default score of 1 is used.

The HSI metric is Habitat Code (Range 0 to 6) + or – Matrix Code (Range 0 to 6, Default 0) x Formation Code (Range 0 to 1) x Management Code (Range 0 to 1)

The HSI score is multiplied by the location of the proposed site in relation to that of the species record. A Consideration Zone is determined by either the home range or dispersal distance of the species being assessed and divided into three Density Bands. The three Bands are, 'A' closest to the record, 'B' and 'C' furthest from the record valued at 3, 2 and 1 respectively.

Table 1: Density Banding

Band	Score
A	3
B	2
C	1

In this case the application site falls nearly all within Band C for Greater Horseshoe bats being located about 4km away as 'the crow flies' from the Cheddar Caves and any subsidiary roost.

'*There is wide acknowledgement that ratios should be generally well above 1:1. Thus, compensation ratios of 1:1 or below should only be considered when it is demonstrated that with such an extent, the measures will be 100% effective in reinstating structure and functionality within a short period of time (e.g. without compromising the preservation of the habitats or the populations of key species likely to be affected by the plan or project).*' (European Communities, 2007)

In considering replacement habitat Defra has set out three different multipliers in its biodiversity offset pilot to counter risk in three areas: delivery, spatial and temporal. These have been adopted for use with the HEP. As different habitats have different levels of difficulty in creation or restoration of there will be different risks associated with each. Defra (2012) consider that restoration is likely to be a lower risk than creation.

[25] IHS considers that patches of scrub and single trees are matrix habitat acting in combination with main habitats types rather than separate habitats in their own right.

Table 2: Multipliers for different categories of delivery risk (Defra, 2011)

Difficulty of recreation/restoration	Multiplier
Very High	0.1
High	0.33
Medium	0.67
Low	1

Spatially an offset located so that it is accessible to a species population affected has a multiplier of 1:1; this would be the case in this assessment.

In delivering offsets there may be a difference in timing between the implementation of the development and the functionality and maturity of the replacement habitat. Where a time lag occurs, a multiplier will be applied to take account, or the risk involved to the 'no net biodiversity loss' and a 'net gain where possible' objective. Defra (2012) have based the time period multiplier recommendation from their Environmental Liability Directive guidance and that used in the Treasury Green Book, which recommends a discount rate of 3.5%. These are set out in Table 3 below.

Table 3: Multipliers for different time periods using a 3.5% discount rate

Years to target condition	Multiplier
1	0.965
5	0.837
10	0.70
15	0.59
20	0.49

This calculation results (Table 4) in a minimum area of 0.21ha of replacement habitat that would be required to replace habitat losses to Greater Horseshoe bats as a result of the development. The amount of replacement habitat provided (Table 5) is 1.01ha less the existing value of the receptor site of 0.42ha which gives an enhancement of 0.39ha.

Table 4: Greater Horseshoe bat: HEP worksheet for value of replacement habitat required

Baseline Conditions

On Site (at least 0.26ha hectares required):

Field No	Habitat	Primary Habitat Code	Primary Habitat Score	Matrix Code	Matrix Score	Formation Code	Formation Score	Management / Land use Code	Management / Land use Score	HSI Score	Density Band Score	Hectares	Habitat Units	Spe
	Semi Improved grassland	GU0	4	N/A	0	N/A	1.00	GM11 - cattle grazed	1.00	4.00	1.0	1.122	4.49	
H1	Important Hedgerows	LF111	6	N/A	0	N/A	1.00	LT4 - Road side	0.50	3.00	1.0	0.01674	0.05	H1 to be partly new footway ac village centre, a
H6	Important Hedgerows	LF111	6	N/A	0	N/A	1.00	LT4 - Road side	0.50	3.00	1.0	0.03117	0.09	H6 to be partl developmen access). Appro be transplan high
			0		0		1.00		1.00	0.00			0.00	H2, H4 & H5 and included as reta This may need t lighting plan ha
			0		0		1.00		1.00	0.00			0.00	
												1.16991		
											Habitat Units		4.63	
											Hectares Required		0.26	
									Value from 'Replacement Habitat' worksheet		Equivalent Hectares Provided		1.49	
Note. Where there is significant residual replacement habitat that cannot be accommodated within the proposed development site off site enhancement will be needed. The amount required will be increased by the value of the existing habitat on the receptor site (see A5.54 in the Technical Guidance)											Equivalent Hectares of Existing Habitat on Receptor		1.24	
								If required, Value from Receptor Habitat Worksheet						
											Gain/ Deficit		0.00	
								If deficit then further input is required into either 'Replacement Habitat' and/or Off-site Replacement Habitat' worksheets until an equal or gain is provided. (Non-significant amounts of loss need to be agreed with planning authority ecologist)					

Off Site Receptor Habitat (Rug Hill):

Habitat	Primary Habitat IHS Code	Primary Habitat Score	Matrix Code	Matrix Score	Formation Code	Formation Score	Management / Land use Code	Management / Land use Score	HSI Score	Development site Density Band Score	Receptor Sit Density Band S
Improved grassland	GI0	3	N/A	0	N/A	1.00	GM11 - cattle grazed	1.00	3.00	1.00	1.00
Improved grassland	GI0	3	N/A	0	N/A	1.00	GM11 - cattle grazed	1.00	3.00	1.00	1.00
Dense scrub	GU0	4	SC1 Dense/continuous scrub	-3	N/A	1.00	N/A	1.00	1.00	1.00	1.00
Scattered oak tree in middle of field not included as retained with no change		0		0		1.00		1.00	0.00	1.00	1.00
											Equivalent Value of Habit

Table 5: Greater Horseshoe bat: HEP worksheet for value of mitigating habitat provided.

Replacement Habitat

Habitat	IHS Code	Score	Code	Score	Code	Score	Code	Score	HSI Score	Hectares	Delivery Risk	Temporal Risk	Development Site Band Score
Built Up Areas	URO	1	N/A	0	N/A	1.00	UA31 - Housing/domestic outbuildings	0.00	0.00	0.552	1.00	1.00	1.0
Gardens	URO	1	N/A	0	N/A	1.00	UA32 - Gardens	0.00	0.00	0.394	1.00	1.00	1.0
Semi Improved grassland (Meadow Species-rich Grassland)	GU0	4	N/A	0	N/A	1.00	GL2111 - Species-rich conservation grassland	1.00	4.00	0.019	0.67	0.83	1.0
Open space and LAP	GU0	4	N/A	0	N/A	1.00	GL1 - Amenity grassland	0.10	0.40	0.157	1.00	1.00	1.0
H1 (retained)	LF111	6	N/A	0	N/A	1.00	LT4 - Road side	0.50	3.00	0.016	1.00	1.00	1.0
H6 (retained)	LF111	6	N/A	0	N/A	1.00	LT4 - Road side	0.50	3.00	0.016	1.00	1.00	1.0
H6 to be translocated	LF111	6	N/A	0	N/A	1.00	LM12 Cut hedge without standards	0.20	1.20	0.015	1.00	1.00	1.0
Other boundaries and linear features (ornmental hedge)	LF2	3	N/A	0	N/A	1.00	LM12 Cut hedge without standards	0.20	0.60	0.146	1.00	0.83	1.0
Broadleaved Woodland (temporal risk reduced													