22 Frome Road, Beckington

Reptile Survey Report

Prepared for: Mr Damian Kelly

Date: November 2022

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Limitations

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The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate.

The methodology adopted and the sources of information used by Nash Ecology Ltd in providing its services are outlined in this Report. The work described in this Report was undertaken between June and September 2022 and is based on the conditions encountered and the information available during the said period of time.

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This report is considered 'valid' for up to two years from the date the walkover survey was conducted. If an application is made after this, then it is advisable to undertake an updated survey. In addition, any significant change to the project should result in consultation with an ecologist as reassessment of the ecological constraints may be required.

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1 INTRODUCTION

1.1 Background and Scope

Nash Ecology Ltd was instructed to carry out a reptile survey of a small (0.283 ha) parcel of land located at '22 Frome Road Beckington Frome BA11 6TD' (see Figure 1). The survey was commissioned to inform proposals to erect three new residential dwellings (Figure 2). An earlier Preliminary Ecological Appraisal (PEA: Nash Ecology, 2022) identified the potential for reptiles to occur within the Site. The current survey was commissioned to ascertain whether reptiles were present.

The remainder of this report provides methods, results and a discussion of potential impacts including, where necessary, a suitable mitigation strategy.

Figure 1: Site Location

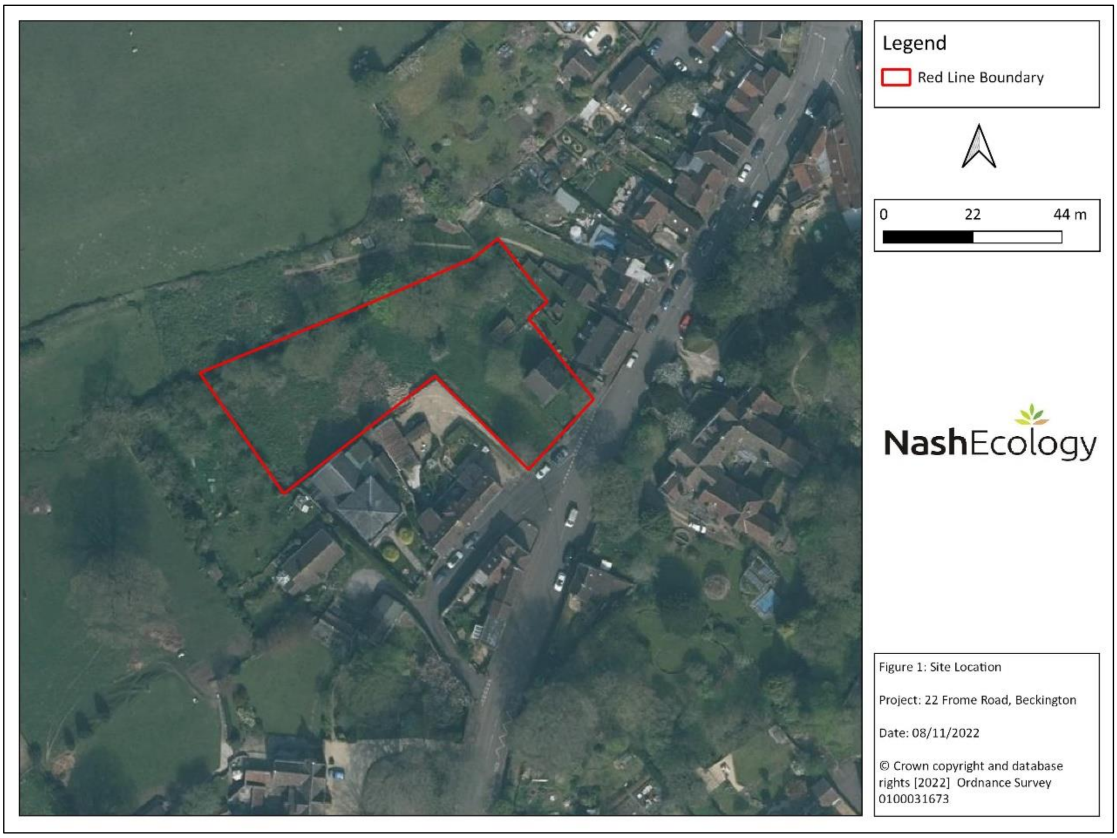
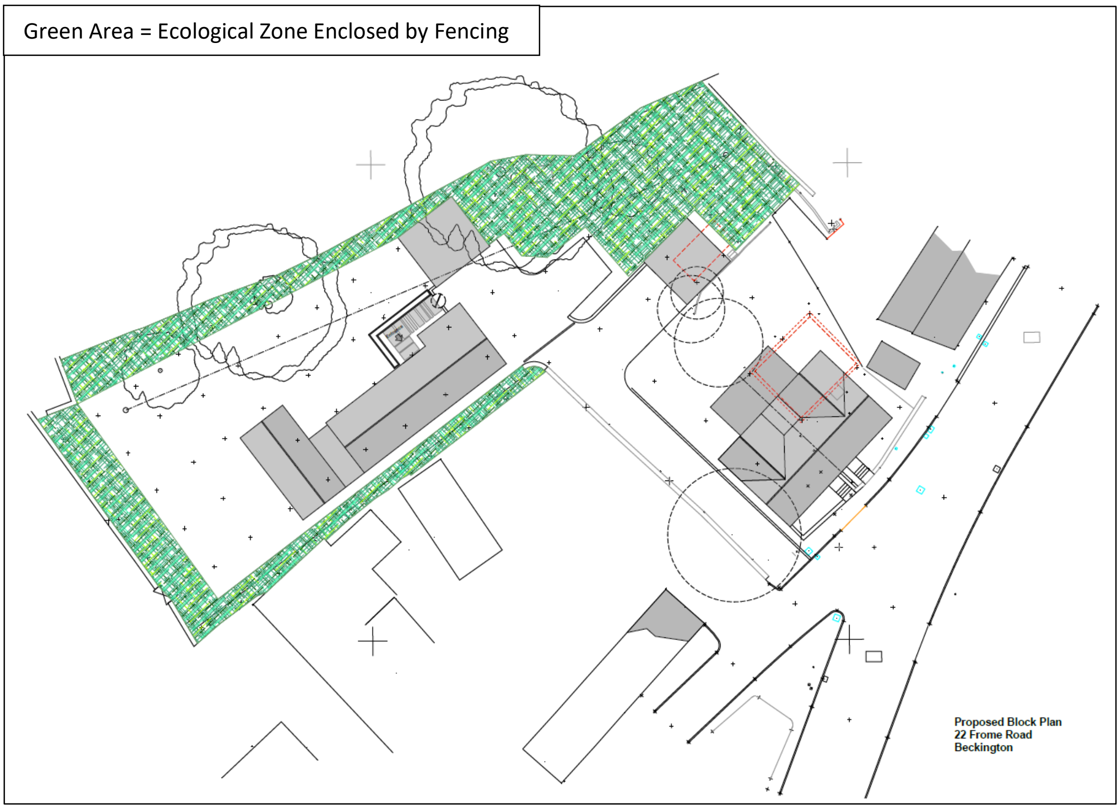


Figure 2: Proposed Development



1.2 Legislation and Planning Policy Summary

1.2.1 Summary of Legislation

There are four widespread species of reptiles in England, namely:

- Adder (*Vipera berus*);
- Grass snake (*Natrix helvetica*);
- Common lizard (*Zootoca vivipara*); and
- Slow-worm (*Anguis fragilis*).

All widespread species receive legal protection through their inclusion on Schedule 5 (Sections 9(1) and 9(5)) of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly kill or injure a reptile; however, unlike European Protected Species, their habitat does not receive legal protection.

All reptiles are listed as 'Species of Principal Importance for Conservation in England' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the same Act requires that local and regional authorities have regard to the conservation of biodiversity in England, when carrying out their normal functions.

1.2.2 Planning Policy Summary

The National Planning Policy Framework (NPPF) 2021 was considered in the preparation of this report. The NPPF specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this is to be delivered in the planning system. Protected or notable habitats and species should be considered as a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development. If the development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

1.2.3 Good Practice

Current guidance stresses the need for developers to maintain protected species within their current range at a favourable status. To achieve this, developers are often required to include mitigation strategies with their applications that describe how the project will identify and remediate potential adverse effects. The hierarchy of mitigation in descending order of preference is to avoid, mitigate and compensate (CIEEM, 2016). Relating this directly to reptiles, this should be interpreted as avoid (adjust spatial/temporal plans to avoid impacts, thereby maintaining reptiles within their current distribution), mitigate (provision to be deployed to ensure no adverse effects such as habitat loss) and compensate (recreate habitat either on or offsite and translocate the reptiles). Translocation is listed as the least preferred option in current guidelines (Gent & Gibson, 1998; English Nature, 2004) and there is an increasing body of evidence to indicate that as a mitigation tool, it is less effective at conserving populations (Platenberg & Griffiths, 1999; Germano *et al*., 2015; Nash, 2018; Nash *et al*., 2020) than other methods.

Prior to undertaking the assessment, the following documents were consulted:

- Evaluating local mitigation / translocation programmes: maintaining best practice and lawful standards (Herpetofauna Groups of Britain and Ireland, 1998): This document presents the minimum standards for required for appropriate mitigation;
- Froglife Advice Sheet 10: reptile survey – an introduction to planning, conducting and interpreting surveys for snakes and lizard conservation (Froglife, 1999): Although tailored largely for conservation work, this document describes the minimum standards required for undertaking survey and assessment.
- Herpetofauna Workers' Manual (Gent & Gibson, 1998): Aimed principally at voluntary surveyors, the Herpetofauna Workers' Manual provides information on survey techniques, habitat management and mitigation (specifically, translocation);
- Reptiles: guidelines for developers (English Nature, 2004): This document provides guidance on survey planning impact assessment and mitigation; and
- Design manual for roads and bridges (DMRB) nature conservation advice in relation to reptiles and roads (Highways Agency, 2005): Although written with road projects in mind, this section of the DMRB provides comprehensive advice in relation to surveying, impact assessment and mitigation applicable to most projects.

2 METHODS

2.1 Desk-based Study

A desk-based study was carried out as part of the earlier PEA (Nash Ecology, 2022). For ease, records relating to reptiles have been replicated within this report.

2.2 Field Survey

2.2.1 Habitat Assessment

The Site was assessed for its suitability to support reptiles; the assessment included the following elements:

- Vegetation structure;
- Sun exposure;
- Aspect;
- Topography;
- Surface geology;
- Habitat connectivity;
- Prey availability;
- Hibernation opportunities;
- Egg-laying habitat; and
- Disturbance.

Based on this assessment, the Site was ascribed a value of either 'Poor', 'Moderate' and 'Exceptional' following published guidance (Natural England, 2011).

2.2.2 Field Survey

Reptile species are considered difficult to detect due to their secretive lifestyle, often cryptic coloration and wary behaviour (McDiarmid *et al*., 2012). To maximise the likelihood of detecting reptiles, the survey incorporated to two distinct techniques during each visit; namely Direct Observation Survey and Artificial Refuges Survey. Both techniques have advantages and disadvantages; however, when used concurrently the combination of these two techniques greatly increases the detectability of native British reptiles (Sewell *et al*., 2013).

Direct Observation Survey

Reptiles are ectothermic, which means that they must derive much of their body heat from their surroundings. Basking is an essential component of reptilian biology and one that can be exploited by a reptile surveyor. During cooler spells (typically in the morning and evening) reptiles will seek out sunny, undisturbed patches of habitat in which to bask; favoured features include south-facing slopes, open rides and piles of brash or rubble.

The surveyor slowly walked predetermined transects, typically following the line of artificial refuges but deviating to incorporate natural features such as log piles. The surveyor would scan three or four meters ahead for basking or fleeing reptiles. Although the routes were kept consistent, the direction that it was followed was varied. Where reptiles were observed, their location was recorded as the nearest artificial refuge.

Direct observation is effective at detecting viviparous lizard, grass snake and adder (DMRB, 2005); however, slow worm, are reluctant to bask in the open (i.e. cryptoheliotherms). This species actively seeks out warmer mediums from which to absorb heat by conduction. For such species, direct observation is unlikely to be successful.

Appropriate climatic conditions are critical for direct observation to be effective; surveys were undertaken under a range of climatic conditions.

Artificial Refuges Survey

This survey technique exploits the propensity for reptiles routinely to seek out features that both act as places of shelter from predation or disturbance and as aids in absorbing heat (DMRB, 2005). Reptiles tend to use features within their environment that heat up quickly and/or retain heat throughout the day. The placement and subsequent checking of artificial refuges has been shown to be an effective method of detecting otherwise cryptic species of reptile including the slow worm (Reading, 1997).

Thirty artificial refuges (0.5 m^2 sections of roofing felt) were deployed at the Site (Figure 2). The artificial refuges were selectively placed within suitable habitat and, where possible, adjacent to features of interest (Natural England (2011) reports that those placed in large open areas are less effective than those adjacent to patches of cover). Refuges were also placed within scrubbed areas, where accessible and dabbled sunlight reached ground level. Once placed (i.e. 4th May 2022), the artificial refuges were left to settle in for around two weeks before the first check (i.e. 17th May 2022) in accordance with published recommendations for effective survey (Edgar *et al*., 2010). Thirty refuges within a 0.28 ha Site equates to a density of c. 108 ha^{-1}, far exceeding the minimum of 10 per hectare of suitable habitat as recommended by published guidance (Froglife, 1999).

Each artificial refuge was checked seven times between May and September 2022; all reptiles encountered were recorded. As the survey only sought to count individual reptiles and due to the propensity of lizards to lose their tails (autonomy), no reptiles were handled throughout the study.

The locations of reptile encounters were mapped to identify areas and/or habitats of particular importance for reptiles.

The success of surveys in detecting reptiles is highly dependent upon the prevailing climatic conditions. Froglife (1999) describes the following environmental parameters that should be complied with:

- Air temperature between 9°C and 18°C;
- Sunny or hazy days;
- No rain;
- Little to no wind; and
- Avoid prolonged periods of dry or exceptional hot weather.

All visits were in suitable conditions for reptile detection but were deliberately selected to span a range of times of day and weather conditions to maximise detection of reptiles.

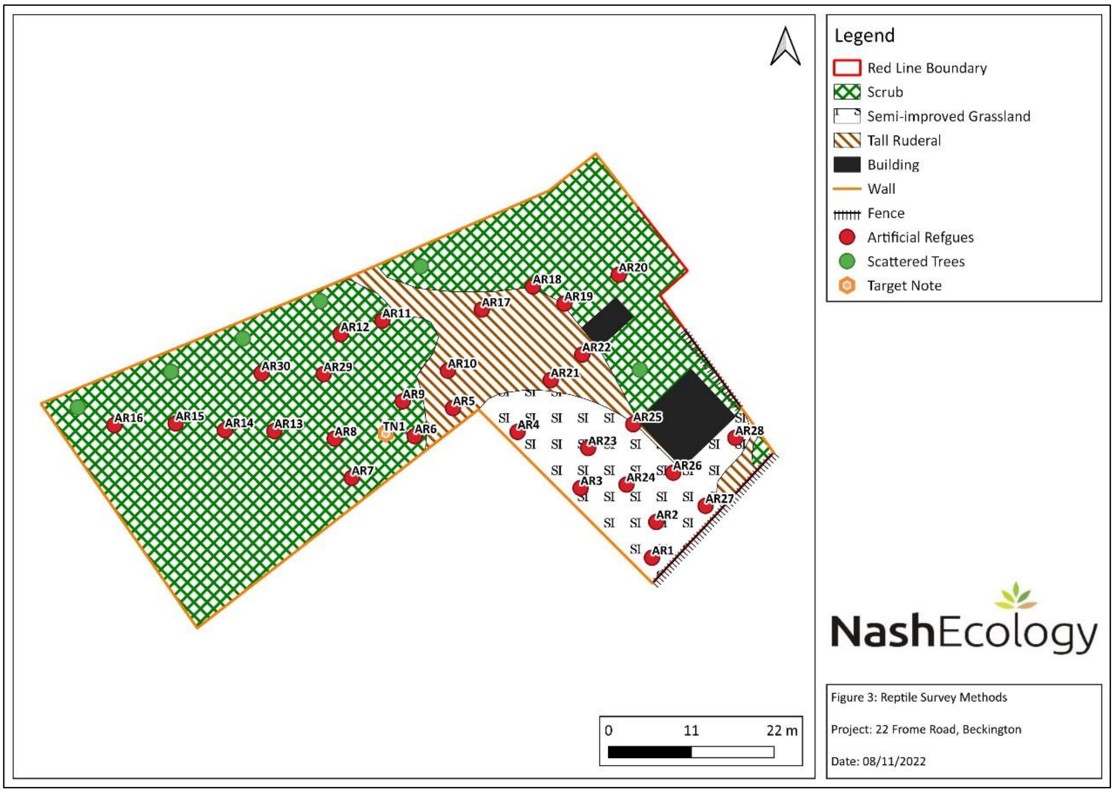
The following Population Size Classes are based on Natural England (2011). Although this document was subsequently withdrawn (for issues arising from mitigation not survey), the methods used to categorise population sizes remain the most contemporary (i.e. it is based on current estimates of population densities) and incorporate habitat suitability and size (important factors omitted by earlier guidance documents). Both approaches to determining Population Size Class were used and the method that returned the most conservative estimate was adopted.

Table 1: Population Size Classes (Natural England, 2011)

Species	Population Size Class		
	Small	Medium	Large
Slow-worm	<10 or presence + poor HSA	10 – 40 or presence + good HSA	>40 or presence + exceptional HSA
Viviparous lizard	<5 or presence + poor HSA	5 – 20 or presence + good HSA	>20 or presence + exceptional HSA
Grass snake	<5 or presence + poor HSA	5 – 10 or presence + good HSA	>10 or presence + exceptional HSA
Adder	<5 or presence + poor HSA	5 – 10 or presence + good HSA	>10 or presence + exceptional HSA

HSA – Habitat Suitability Assessment

Figure 3: Survey Methods Map



2.3 Survey Limitations

No constraints were noted.

3 RESULTS

3.1 Desk-based Study

Historical records of slow-worm and grass snake were received from SERC.

A survey of the Site in 2019 (First Ecology, 2019) identified a population of slow-worms. A peak count of 13 adults was achieved.

3.2 Field Survey

3.2.1 Habitat Suitability Assessment

Table 2: Habitat Suitability Assessment

Factor	Description
Vegetation Structure	The Site comprised a residential garden in which most (if not all) habitat management had ceased. Stone walls demarked the northern and western boundaries and part of the eastern and southern boundaries. Currently, the Site was dominated by dense, continuous bramble scrub. Tall ruderal had developed but was slowly being encroached upon and replaced by scrub. Two areas of lawn had developed a tall sward with a litter layer at its base.
Sun Exposure	The Site received reasonably high levels of insolation. Shade was cast by adjacent houses and walls (which were at a higher elevation), trees and the dense scrub.
Aspect	The Site was orientated east-west.
Topography	The ground sloped gently to the north.
Surface Geology	Much of the Site comprised free-draining earth.
Habitat Connectivity	Large extents of suitable habitat can be found locally; however, the stone walls are likely to buffer movement by reptiles. There are gaps in the east in which reptiles could migrate without hindrance.
Prey Availability	A range of ants, beetles and snails / slugs were observed beneath the refuges.
Hibernation Opportunities	A large pile of stone (TN1, Figure 3; Plate 2) was present on Site.
Disturbance	Since the cessation of management, the Site was not subject to disturbance. A family of pheasants were present on Site and the species is known to predate on lizards.
Egg-laying Habitat	The boundary vegetation would provide suitable egg-laying strata.

The Site did include suitable habitat for both widespread lizard species. The small size and surrounding walls were likely to limit its suitability for snakes. The Site was reasonably well connected to suitable habitat in the wider landscape. Overall, the Site was assessed as 'Good' for reptiles.

Plate 1: Grassland / Tall Ruderal Vegetation

Plate 2: Stone Pile Within the Tall Ruderal

3.2.2 Field Survey

The environmental conditions recorded during the survey are presented in Table 3. The results of the survey are provided in Table 4. A summary of the reptile encounters is provided as Figure 4.

Table 3: Survey Dates and Environmental Conditions

Visit	Date	Times	Air Temp. (°C)*	Wind Speed **	Cloud Cover (%)	Ground Conditions***
1	17/05/2022	08:40 – 09:30	13	2	40	Damp
2	19/05/2022	09:00 – 09:50	13	1	75	Damp
3	23/05/2022	09:40 – 10:05	12	2	90	Damp
4	02/06/2022	09:30 – 10:05	15	1	90	Damp
5	16/06/2022	07:30 – 08:30	14	1	0	Damp
6	06/09/2022	10:15 – 10:35	14	2	30	Damp
7	08/09/2022	12:30 – 13:00	13	2	10	Damp

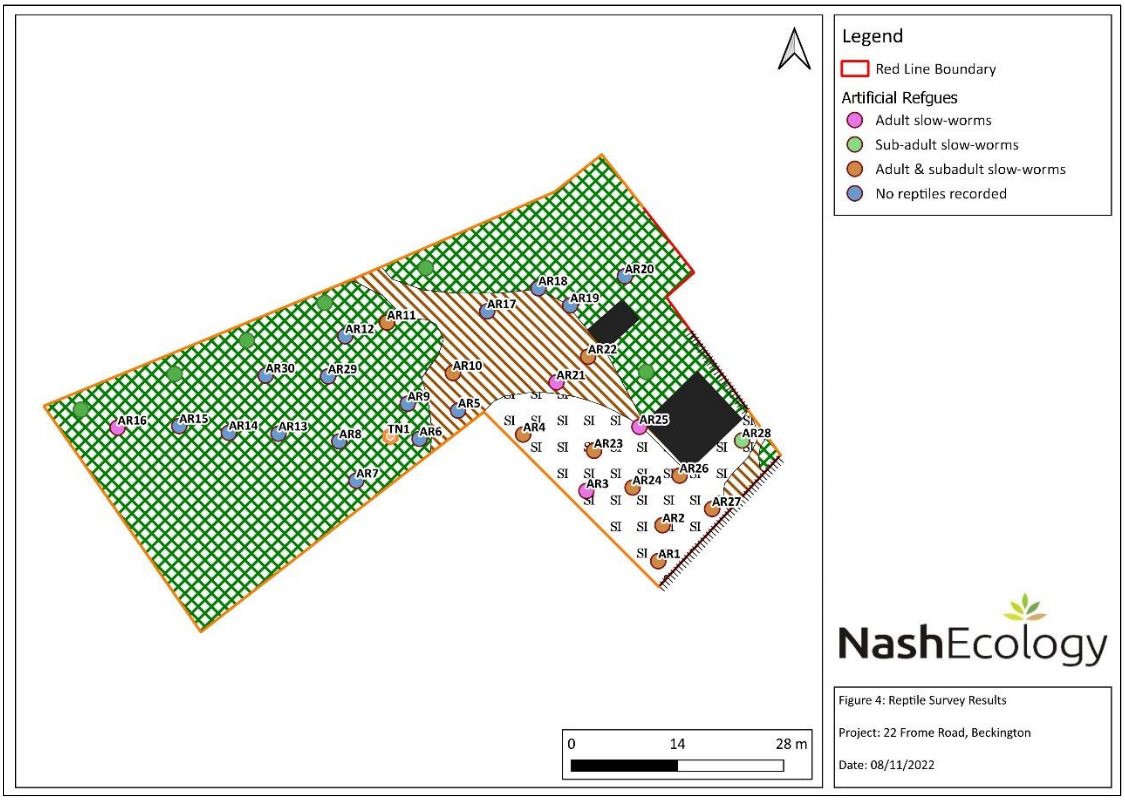
* taken at the start of the survey; ** Beaufort Scale; *** wet (standing water on or around refuge), damp (wet ground but no puddles) or dry

Table 4: Survey Results

Visit	Species	Number	Age Class	Sex (adults only)	Location
1	Slow-worm	1	Sub-adult	-	AR1
		1	Adult	Female	AR3
		4	Adult (3), Sub-adult (1)	Female (2), Male (1)	AR4
		1	Adult	Female	AR10
		2	Adult (1), Sub-adult (1)	Female (2)	AR11
		1	Adult	Male	AR16
		1	Sub-adult	-	AR24
		1	Sub-adult	-	AR26

Visit	Species	Number	Age Class	Sex (adults only)	Location
		2	Adult (1), Sub-adult (1)	Male	AR27
		1	Sub-adult	-	AR28
2	Slow-worm	1	Adult	Male	AR21
		2	Adult (1), Sub-adult (1)	Male	AR22
		1	Adult	Male	AR23
		1	Sub-adult	-	AR11
		3	Adult (2), Sub-adult (1)	Male	AR4
		1	Adult	Male	AR3
		1	Sub-adult	-	AR24
		1	Sub-adult	-	AR2
		1	Adult	Female	AR1
3	Slow-worm	1	Adult	Female	AR2
		1	Adult	Female	AR24
		1	Adult	Male	AR1
		1	Sub-adult	-	AR23
		2	Adult	Female	AR3
		1	Adult	Female	AR4
		1	Sub-adult	-	AR11
		1	Adult	Female	AR22
		1	Adult	Male	AR25
		2	Adult (1), Sub-adult (1)	Male	AR26
		4	Adult (2), Sub-adult (2)	Male	AR27
4	Slow-worm	1	Adult	Male	AR2
		1	Sub-adult	-	AR1
		3	Adult	Male (2), Female (1)	AR3
		2	Adult (1), Sub-adult (1)	Female	AR10
		1	Sub-adult	-	AR11
		1	Adult	Female	AR22
		1	Adult	Female	AR24
		1	Adult	Female	AR25
		4	Adult (3), Sub-adult (1)	Male (1), Female (2)	AR27
5	Slow-worm	1	Adult	Male	AR1
6	Slow-worm	1	Adult	Female	AR25
7	Slow-worm	1	Adult	Female	AR25

Figure 4: Survey Results Map



A peak count of 11 slow-worms was detected. The population was distirubuted primarily within the grassland.

4 DISCUSSION

4.1 General

A population of slow-worms was detected at the Site with a peak count of 11 adults. Irrespective of which method is used, a medium-sized population was recorded (‘11 - 100’ or ‘presence + Good habitat’). This result accords with the earlier survey (First Ecology, 2019), which also reported a medium-sized population (peak count 13). As the species is highly detectable (detection probability of ≥ 0.82 assuming appropriate survey), the consistently low numbers recorded are more indicative of a medium population at the lower interval of the size bracket. A range of ages and sexes were recorded, which is indicative of a breeding population. Accordingly, the size of the population is likely to vary throughout the year - increasing post-parturition and decreasing after winter as a result of increased mortality. Ultimately, the small extent of the site is likely to cap the number of slow-worms it can support.

Slow-worms are largely sub-fossorial and spend much of their time deep within vegetation, leaf litter or loose soil. This is in part an adaptation to reducing predation but they are also adapted to hunting in such conditions. As a species, slow-worms are reluctant to cross open habitats that would result in them being exposed to predators. The population appeared to be centred on the grassland and tall ruderal vegetation. This is likely due to shading beneath the dense scrub, which would limit the effectiveness of survey with artificial refuges. Indeed, the unchecked expansion of the scrub is likely to be problematic for the species as it will reduce basking opportunities. Although suitable habitat was located to the west and south of the Site, the boundary (stone) walls are likely to represent a significant barrier to the movement of slow-worms.

4.2 Impact Assessment

The erection of four dwellings will reduce the availability of suitable habitat. In the absence of mitigation, slow-worms are likely to be killed or harmed during construction activities, an offence under the Wildlife and Countryside Act 1981 (as amended). Appropriate mitigation will be required to ensure that no slow-worms are harmed by the development.

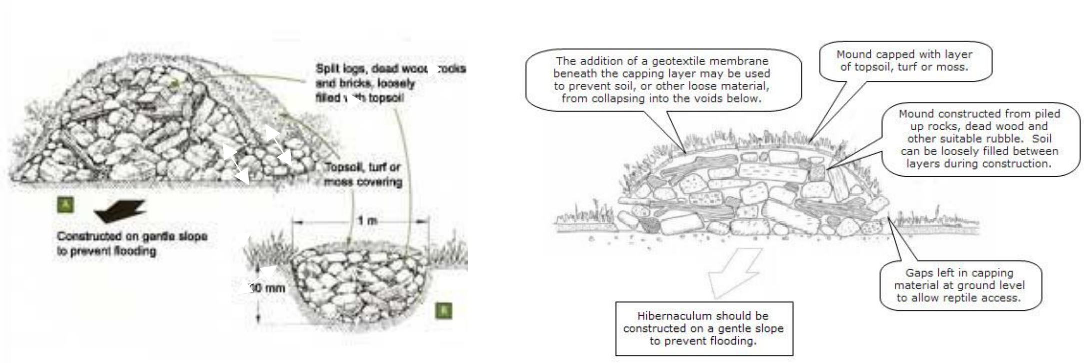
4.3 Proposed Mitigation

Sufficient suitable habitat will be retained to enable the small population of slow-worms to be kept on Site; specifically, an area of habitat will be set aside and managed for wildlife (see Figure 2). This ‘buffer zone’ (green hatched area) will comprise an area in the east measuring c. 20 m x 35 m coupled with 5 m wide vegetated strips along the eastern and western boundaries. No access to the buffer zone will be permitted to the contractors or occupants of the new houses. A large (2 m) wooden fence would be erected along the inside of the buffer zone. Locked gates to the buffer zone would be fitted at the Frome Road to enable habitat management works. Inside the buffer zone, the habitat would be managed in perpetuity as a rank grassland / scrub mosaic; scrub will not be permitted to exceed 30% ground cover. Grassland cutting would only be undertaken once a year (September – October) and to a height of no lower than 15 cm. Grass clippings will be left on Site in piles. Scrub clearance would be undertaken as and when needed using hand tools only.

To increase permeability of the buffer zone, and therefore the movement of slow-worms, large holes would be created in the bases of the western and northern boundary walls. These holes would be fitted with clay pipes augmented with a layer of leaf litter to ensure that they stay open and are usable by slow-worms.

A hibernation feature would be created within the receptor site (Figure 5). Piles of stone and brash (available on site) would be placed in a pile within the receptor area. The hibernaculum should be sited in a sunny spell that does not flood.

Figure 5: Hibernaculum Design



To move the slow-worms to the receptor site, a translocation will be undertaken. Once the receptor site is in a suitable condition, Herpetosure fencing (or equivalent) will be erected around the boundary. Artificial refuges will be deployed in the construction footprint (i.e. the area to be cleared) at a high density (c. ≥ 100 ha^{-1}). After an appropriate 'settling in' period, the refuges would be checked on a daily basis during suitable climatic conditions. Any encountered slow-worms would be carefully collected by hand and placed in the buffer zone.

The most current guidelines (HBGI, 1998) specify a minimum translocation period of 60 days. Given the small number of individuals involved coupled with the species' relatively high detection rate, this is disproportionate to the scale of impact. As such, an alternative approach to calculating translocation effort is recommended. The Reptile Mitigation Guidelines (Natural England, 2011 – currently withdrawn) provide a calculation for determining the length of translocation required. The equation incorporates detection probabilities by species and habitat quality (Table 5).

Table 5: Translocation Effort

Species	Score	Site Size	Population Size Class
Slow-worm	15	0.3 (0.1 – 0.5 ha)	0.5 (medium)

To determine the length of the translocation, the above figures are entered in equation 1 below:

Equation 1: Translocation Effort

Species Score x (Site size + Population Size)

$$15 \times (0.3 + 0.5)$$

$$12$$

A minimum translocation of 12 suitable days would be required. Suitable in this case is defined as dry, sunny (10 – 18 °C), little wind and no rain. Sunny spells between rain showers are acceptable and may prove to be particularly profitable. Five consecutive encounter-free days (i.e. days when no slow-worms are seen or captured) are required to complete the translocation. The translocation should only be carried out between March and October (when reptiles are active).

On completion of the translocation, a destructive search of the remaining habitat would be undertaken.

5 REFERENCES

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