

# **The slow worm survey 2019**

## **1. Background**

### **1.1. Slow worm (*Anguis fragilis*)**

Slow worms are legless lizards native to Eurasia. They are widespread across the UK. They are semifossorial (burrowing), meaning they spend a lot of time underground and underneath objects. Thus, they are very secretive and hard to see.

Slow worms can grow up to 40-50 cm long. The skin of a slow worm is smooth and shiny. Males and females can be told apart by their colour. Males are generally uniform grey or brown in colour. Males have a larger and broader head than females. Females are usually golden brown on top and darker on sides and belly. Females often have a dark stripe running along back. Juveniles of both sexes are gold with dark brown bellies and sides. They have a distinct black vertebral line that starts as a black spot on their head and extends to their tail. Juvenile slow worms are very thin and initially 4cm long. Slow worms shed their skin. As lizards, they have the ability to lose their tail to escape from a predator. They can only do this once and a new tail will be significantly shorter than the original.

Slow worms are exceptionally long-lived. They can live up to 20 years in the wild. Males reach sexual maturity after second or third hibernation and females a bit later after third or fourth hibernation. Slow worms attain their adult coloration by their fourth hibernation (Gent & Gibson 1998).

Slow worms are ectotherms, so they don't generate their heat internally but source it from the external environment. Slow worms don't usually bask out in the open like other reptiles. Instead they hide under objects that will be warmed by the sun or will create their own warmth such as compost heaps or dead wood. Slow worms are commonly found in heathlands, grasslands, hedgerows and woodland edges, as well as gardens. Generally, the habitat needs to provide both dense vegetation for cover and sunny basking areas where slow worms can bask under rocks, debris or other objects.

Like other reptiles, slow worms hibernate, usually from October to March. Hibernation areas must be insulated enough to prevent freezing temperatures, and should afford some protection from predators. Favoured areas include well-drained overgrown banks, crevices in rocky areas, compost heaps, under log piles, and amongst tree roots.

Mating season is between April and May. Males are territorial during this period and will fight between each other. Females give birth to live young from late August through September. The litter size varies usually between 6 and 12. According to Beebee & Griffiths (2000) the majority of females do not produce young every year. A biennial breeding cycle is the norm in Britain. Though, it depends upon the size of the individual and environmental conditions.

Slow worms feed on a variety of invertebrates. They prefer slow-moving, soft-bodied species, such as slugs and worms. Slugs and worms can often be found in long grass and other damp environments. Thus, slow worms like humid conditions and emerge from their hiding places at dusk or after rain to hunt for food. Predators to slow worms include some birds of prey, hedgehogs, rats, domestic cats etc.

### **1.1. General guidelines for surveying slow worms**

There are two main methods used for surveying reptiles: direct observations and artificial refuges. Direct observation surveys aren't recommended for slow worms, since slow worms don't usually bask out in the open like other reptiles. Slow worms prefer to hide under objects that are warmed by the sun, thus the use of artificial refuges is recommended (Foster 2011).

The most common material used as refuges is corrugated iron (Froglife 1999). However, the (careless) use of iron sheets have caused some slow worm mortality during the previous surveys conducted on Alderney. Refuges made out of roofing felt were used in this survey. According to Foster (2011) roofing felt is likely to be of similar value to corrugated iron. The careful handling of refuges is still a priority, so that slow worms won't be harmed.

A recommended size for a refuge is 0.5m<sup>2</sup>. However, on sites where human disturbance is likely, small well-concealed or camouflaged refuges may be used (Froglife 1999). The recommended amount of refuges per hectare varies a lot between different guidelines. Froglife's (1999) reptile survey guidelines recommend placing 5 to 10 refuges per hectare. The reptile mitigation guidelines produced by Natural England (Foster 2011) recommend much higher densities. At least 100 refuges per hectare of potential habitat is suggested. The same guidelines recommend a minimum of 30 refuges, whatever the site size. Harrison (2018) found out in her survey that more slow worms were recorded using tins 0.25m<sup>2</sup> in size at a density of 40 per hectare compared to using tins 0.5m<sup>2</sup> in size at a density of 20 per hectare. All the guidelines recommend not to use refuges close to public paths, since this may put the animals at risk. This was the key factor limiting the amount of refuges used during this survey. The refuges should be placed 2 weeks before the survey starts to give animals time to find them (Foster 2011). The refuges should be taken away at the end of the survey (Froglife 1999).

Refuges should only be placed in areas likely to be used by slow worms (Foster 2011). Refuges should be placed in areas where they receive direct solar radiation, at least for part of the day, otherwise they are ineffective. The refuges should be placed near to cover (Froglife 1999). Longer vegetation around the refuge offers slow worms a safe retreat if disturbed. They should also be placed on top of short or flattened vegetation (instead of placing them on bare ground). This helps to trap humidity and gives slow worms a more diverse hiding place (Froglife 1999). If the vegetation dies off underneath, the refuge should be moved to a new location nearby (Foster 2011).

Slow worms are generally active from March to October. The best months for surveying are April, May and September (Froglife 1999). During June, July and August slow worms are active, but since the air temperature tends to be higher they do not need to spend as much time basking under warm objects but move about freely, often deep in the vegetation. That makes them more difficult to find. The best times to search are generally between 8.30am and 11am, and between 4pm and 6.30pm (Froglife 1999). During the midday ambient temperatures tend to be so high that slow worms have lesser requirement to bask.

The slow worm activity is highly affected by weather conditions. Surveys should be targeted to the days when there is no rain, none to moderate wind, and when the air temperature is between 10-20°C

(Foster 2011). The weather sequence plays a role as well. Where possible surveys should be conducted in warm, dry, sunny periods following cold, wet, overcast days (Foster 2011).

Froglife (1999) recommends at least 20 visits per season, in suitable weather for detailed surveys. According to Foster (2011) the period between the first and last survey visit must be at least 30 days and there must be at least 2 days between each survey visit.

Both Joint Nature Conservation Committee (JNCC 2004) and Natural England (Foster 2011) recommend in their guidelines that reptile surveys should include habitat assessment. The refuges used in this survey were placed on habitats that fulfill the following key components listed in the reptile monitoring guidelines produced by Joint Nature Conservation Committee (JNCC 2004).

1. The habitat needs to have open areas (allowing for partial or full insolation) for basking in close proximity to sheltered, vegetated areas for daytime refuge. This combination leads to a need for structural heterogeneity (patchiness) of habitat at and just above ground level.
2. There needs to be night-time refuges.
3. There needs to be enough vertebrate and invertebrate prey items present.
4. The habitat needs to provide enough ground vegetation cover to allow feeding, refuge and dispersal. Reptiles avoid large areas of very short sward or open ground.
5. The habitat needs to have suitable hibernation sites nearby. Hibernation sites must provide protection against frost, flooding and predators.

## **2. The slow worm survey 2019**

### **2.1. Aim**

The aim of the survey was to determine the distribution of slow worms along the south coast of Alderney. The study focused on the Vau du Saou area, which is known to have a small slow worm population. Few refuges were also placed at Trois Vaux and Essex Castle/IMPOT to get an idea of how far the slow worm population spreads.

### **2.2. Methods**

Artificial refuges made out of roofing felt were used. 24 refuges were placed around Vau du Saou. Picture 1 shows the locations of the refuges. The refuges were placed on 29th April. They were surveyed 10 times between 11th May-16th June, and again 10 times between 4th September-6th October. It should be noted that the picture (and the corresponding ArcMap file) only shows the approximate locations of the refuges, since no GPS coordinates were taken for the refuges.



Picture 1. The locations of the refuges around Vau du Saou.

In the spring 6 refuges were placed at the Trois Vaux area and another 6 refuges at the Essex Castle/IMPOT area. The refuges were placed on 16th May. Local volunteers checked the refuges at least one a week until the end of June. The locations of the refuges were changed on 16th August. They were then surveyed 10 times together with the refuges at Vau du Saou between 4th September-6th October. Picture 2 shows the locations of the refuges at Trois Vaux and Essex Castle/IMPOT in the autumn. Again, the map only shows the approximate locations of the refuges, since no GPS coordinates were taken for the refuges.

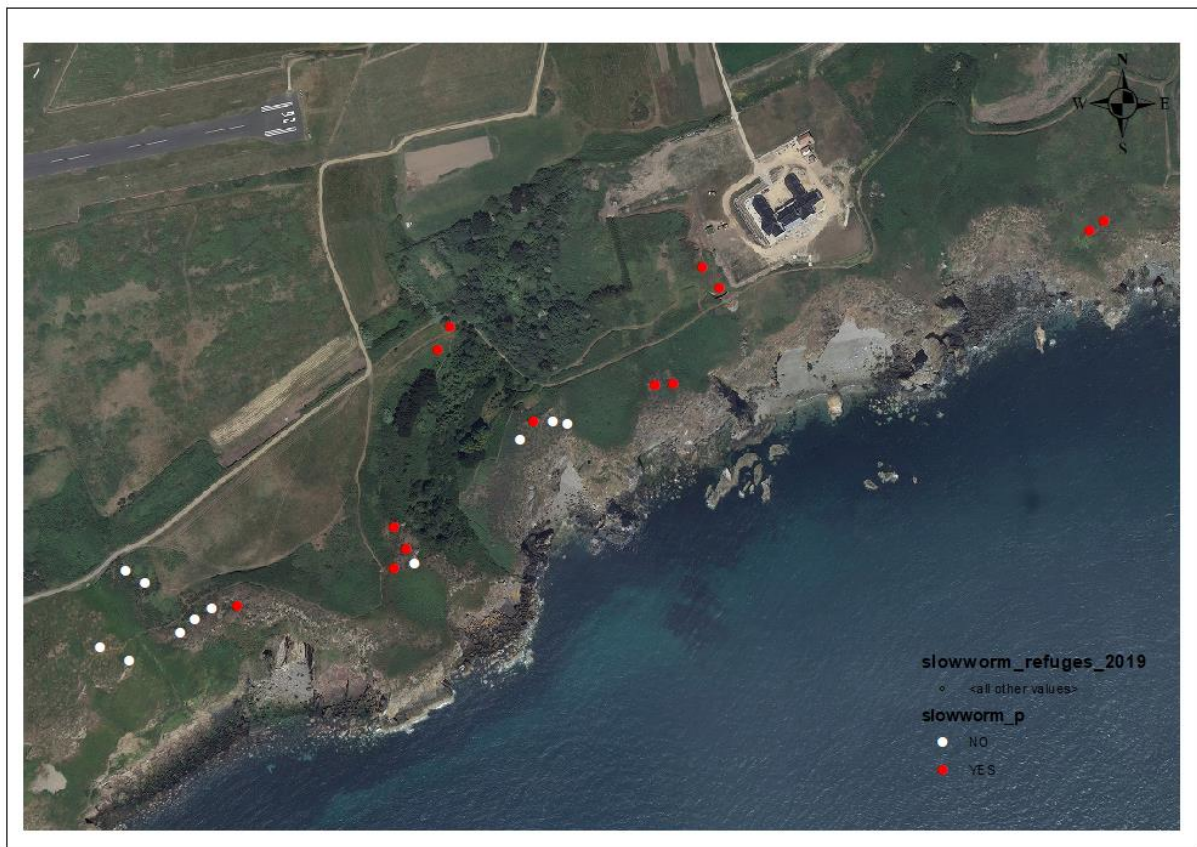


Picture 2. The locations of the refuges at Trois Vaux and Essex Castle/IMPOT in the autumn.

### 2.3. Results

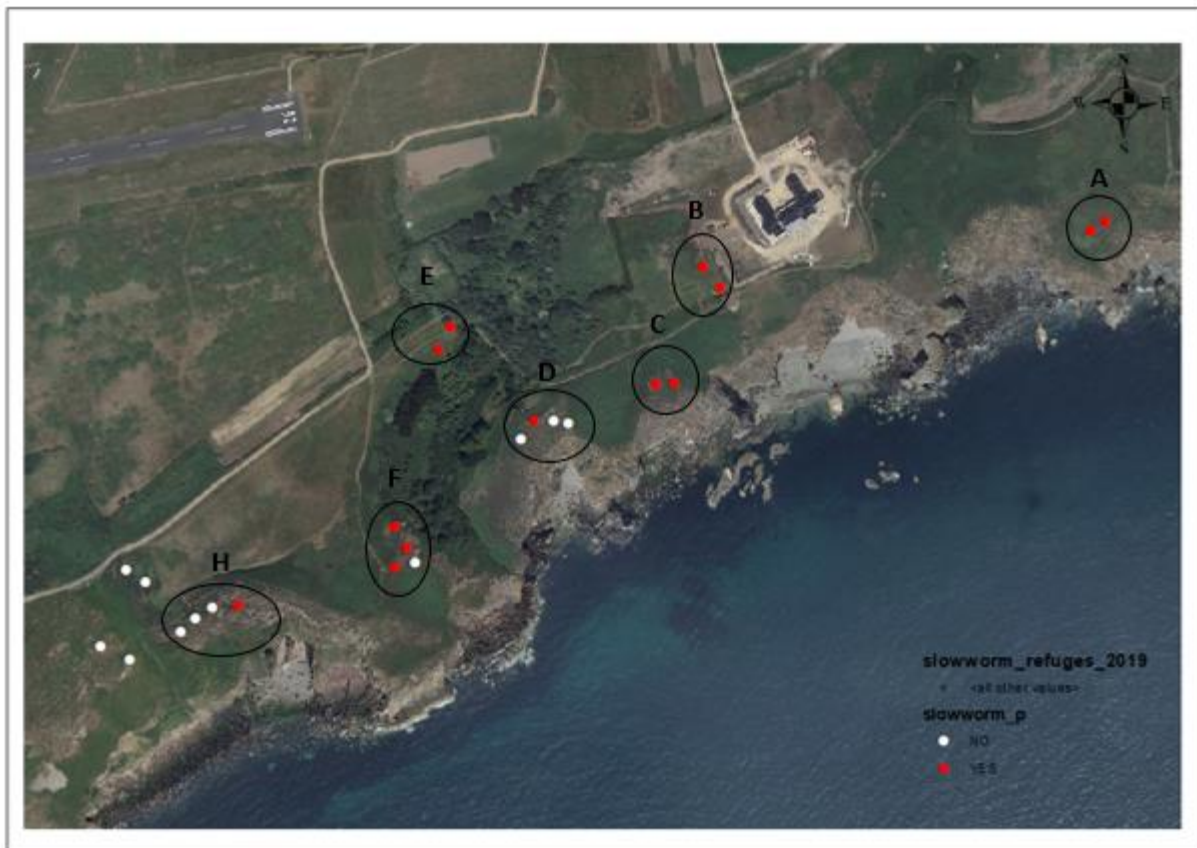
Total of 24 refuges were placed around Vau du Saou. During the survey period (both spring and autumn) slow worms were detected under 13 refuges. Thus, 54% of the surveyed refuges were observed to be occupied by slow worms at some point during the survey. Picture 3 shows the locations where slow worms were seen. Red circle means that slow worms were seen under that refuge at least once during the survey. White circle means that no slow worms were seen under that refuge during the survey.





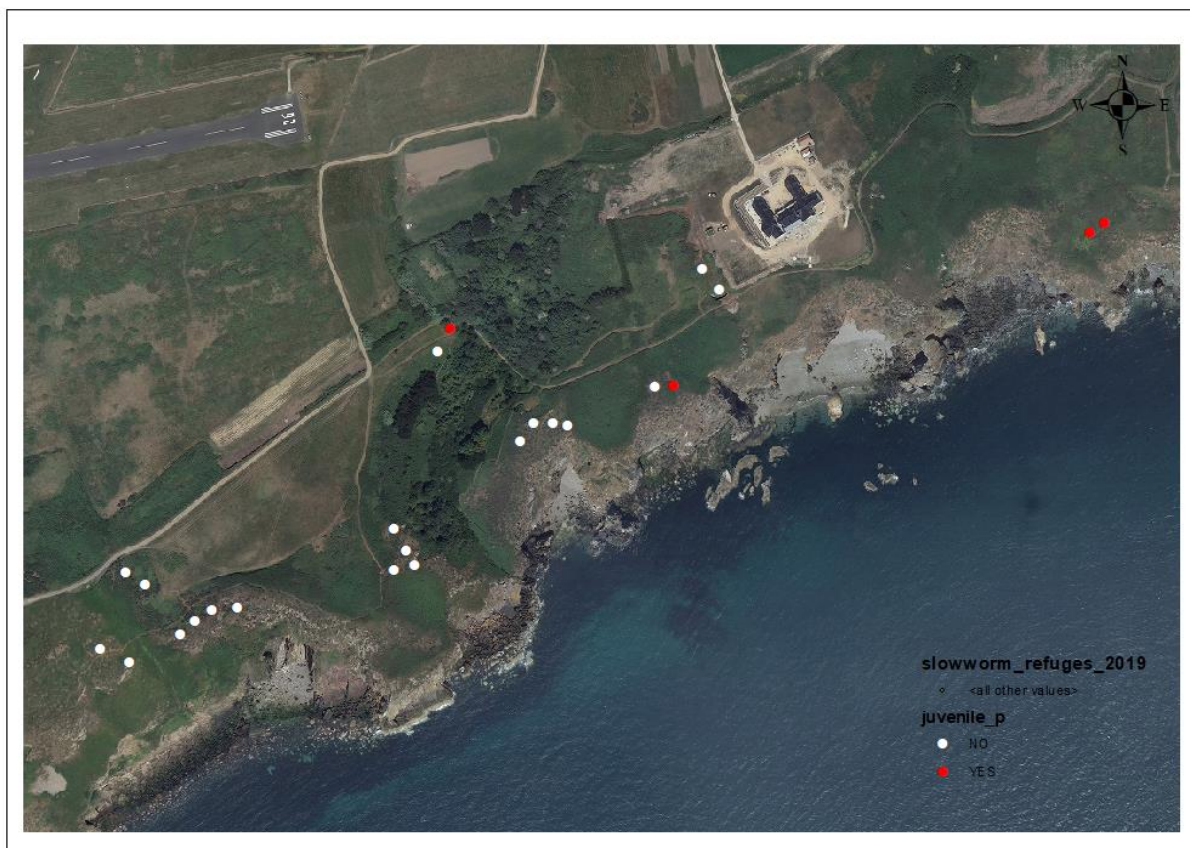
Picture 3. The locations of the refuges under which slow worms were seen.  
(Red circle means that slow worms were seen under that refuge at least once during the survey. White circle means that no slow worms were seen under that refuge during the survey.)

The slow worm abundance seemed to vary within the Vau du Saou area. The areas referred to in the text below can be seen in the picture 4. In area A maximum of 7 slow worms were seen at once. Out of these 4 were adults and 3 babies. Slow worms were seen under 2 out of 2 refuges in this area during the survey. In areas E and F maximum of 3 slow worms were seen at once. In area E slow worms were seen under both of the refuges and in area F they were seen under 3 out of 4 refuges. In area B maximum of 2 slow worms were seen at once. Both refuges in this area were occupied by slow worms. In areas C, D and H only one slow worm was seen at once. In areas D and H only 1 out of 4 refuges was occupied by slow worms. In area C both refuges were occupied by slow worms, and both adults and a baby were seen, but never at the same time.



Picture 4. The refuges divided into areas A to H.

In the autumn pregnant females and later this year's babies were seen under the refuges. Picture 5 shows the locations of the refuges under which babies were seen. Again, red circle means that slow worm babies were seen under that refuge at least once in the autumn. White circle means that no babies were seen under that refuge in the autumn. Breeding females and babies were seen in areas A, C and E. In area A there were at least two breeding females, possibly three. Besides the sightings of pregnant females and juveniles, the presence of different size classes was a positive finding. During the survey, varying sized slow worms were observed: relatively short slow worms with some juvenile colouring, middle size adults and few long, large adults. This would suggest that different age groups are represented in the population.



Picture 5. The locations of the refuges under which slow worm babies were seen.  
(Red circle means that slow worm babies were seen under that refuge at least once in the autumn. White circle means that no slow worm babies were seen under that refuge in the autumn.)

In addition to the survey, there were four recorded casual sightings of slow worms during summer 2019. Two sightings were at Trois Vaux and two at Vau du Saou (Picture 6). The sightings at Trois Vaux show that the slow worm population of Alderney is not restricted to Vau du Saou. One of the slow worm sightings at Vau du Saou was near the stream down at the valley.





Picture 6. Casual sightings of slow worms in 2019.

Besides Vau du Saou, 6 refuges were placed at Trois Vaux and another 6 refuges at the Essex Castle/IMPOT. No slow worms were observed under these refuges during the survey. In the spring, the refuges were placed on 16th May and then checked by local volunteers once a week until the end of June. The timing was too late. The spring part should have been carried out in April and May. Late timing might explain why no slow worms were observed during the spring part.

While placing refuges to Trois Vaux, a slow worm was seen about 5 meters away from a spot where a refuge had just been placed. The refuge was left to that spot during the entire survey. However, no slow worms were observed under that refuge during the survey. This shows how easily slow worm surveys might result in false absences.

## 2.4. Discussion

Joseph Denny (2015) surveyed the slow worm population on Alderney as a part of his dissertation in 2015. 77 refuges were placed in three areas: Longis Common, Essex Castle (Essex Castle and IMPOT), and Vau du Saou (the south coast cliffs from Cachaliere Pier to Trois Vaux). The survey found the presence of a small slow worm population, with 10.4% (8 out of 77) of the surveyed refuges observed to be occupied by slow worms. Slow worms were found occupying 6 out of 29 refuges

(20.7%) at Vau du Saou, 1 out of 29 refuges (3.4%) at Longis Common and 1 out of 19 refuges (5.3%) at Essex Castle.

Based on the results of both this survey and Joseph Denny's survey in 2015, the slow worm population on Alderney seems to be distributed along the south coast from Trois Vaux to Longis Common. Locals have seen slow worms also around the Kiln Farm. The relative abundance seems to be highest in the Vau du Saou area.

### **Reference:**

Beebee, Trevor. & Griffiths, Richard. (2000). Amphibians and reptiles: A natural history of the British herpetofauna. London: HarperCollinsPublishers.

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Gent, A.H. & Gibson, S.D. (1998). Herpetofauna workers' manual. Joint Nature Conservation Committee.

Harrison, V. (2018). Evaluating survey design and long-term population trends in slow worms (*Anguis fragilis*). Master of Science by Research (MScRes) thesis, University of Kent.

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