Reptile translocation and adder telemetry on the A417 Missing Link

Gloucestershire

Kier/National Highways

BIG Biodiversity Challenge Award Category: Innovation Award

Project overview (50 words max)

The A417 is a landscape-led highways scheme in the Cotswolds. Construction of the road occurred within suitable reptile habitat, so the existing reptile population was translocated to receptor sites. Fourteen adders were caught, tagged and radio-tracked in their new habitats to collect data on adder's behaviour post-translocation. Completed September 2023.

What were the biodiversity conditions on site prior to the enhancement? (100 words max)

The site was subject to habitat and population assessments, resulting in the confirmed presence of all four common species of reptiles (adders, grass snakes, slow worms and common lizards). There were many adders found within a relatively small area and several showed similar features, indicating inbreeding may have occurred. Consent was granted for the project in 2022 and legal compliance with respect to reptiles under UK legislation was mandated. Part of the requirement was a large-scale local translocation effort was to be completed to mitigate the risk to reptiles. The telemetry project was an additional undertaking to collect further information.

What were the reasons behind this project? (100 words max)

The driver behind the telemetry project was to collect valuable data on how adders respond to translocation and if it is a successful mitigation practice. Translocation is a common mitigation measure in the UK, however there is a general lack of post-translocation monitoring, so the impact to the species is largely unknown. The intention is to share our findings with many other organisations and use it to inform future mitigation regimes. Adders are currently facing large declines in the UK, so gathering robust data on how they respond to translocation will help to strengthen the resilience of this species.

Female adder fitted with a radio-tag

Close up of the radio-tag used to track the snakes

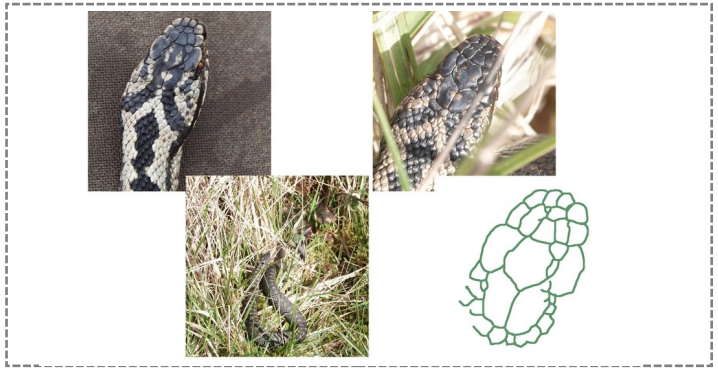
What were the biodiversity measures taken? (300 words max)

The telemetry project was designed to be easily repeatable, relatively low-cost and allows developments to monitor the success of translocation efforts. Simple techniques were employed, such as taking headshots of the individuals and mapping out the scale structure to identify the individuals in the future. The telemetry project was completed in September 2023 however, we aim to continue monitoring the receptor sites for 12 years, with the first year of monitoring commencing April this year. Tagging and radio-tracking adders is not commonly seen in the UK and completing this alongside a large-scale translocation effort is a novel endeavour. It allows the tracking of individuals that would ordinarily be hidden from view.

The receptor sites were all initially assessed for their suitability, based on current habitat, existing reptile populations and having carrying capacity for more individuals. Habitat enhancement and creation measures, such as the installation of hibernacula were completed prior to the translocation. The materials were sourced from felled trees and dry-stone wall that had been removed as part of the clearance works. The enhancements were implemented to provide additional hibernation, basking and breeding areas. In some of the receptor sites, grassland creation and woodland clearance has taken place to provide ecotones and mosaic habitats which help increase habitat connectivity for reptiles. The enhanced receptor areas within the scheme's footprint will contribute towards the overall biodiversity net gain score of the project.

Many of the receptor sites are managed by trusts or charity organisations and had existing reptile populations, so habitat enhancement and monitoring activities have been actively encouraged. On a volunteer day in October 2023, a team of 22 staff from Kier, National Highways and other contracting companies attended two of the receptor sites to help with habitat management tasks to increase the suitability of the site for the reptiles.

An example of the reptile hibernacula created in a receptor site



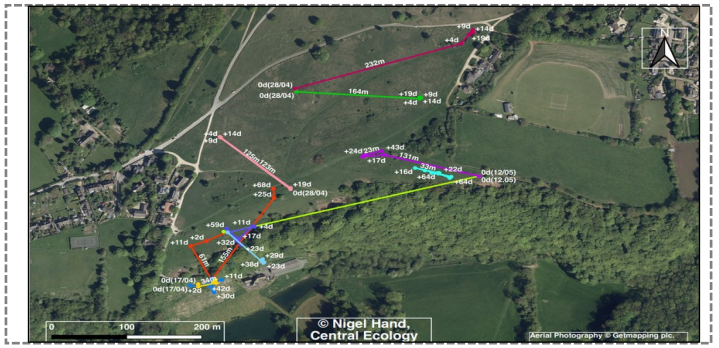
Headshots and scale patterns used to identify the individuals

Further information (250 words max)

At the start of the project, the adders were caught, photographed and data was collected on their condition. They were caught shortly after sloughing and a small radio-tag was attached using surgical glue. The adders were tracked for 45-60 days and data was collected on changes in location and condition. This project was completed alongside an expert herpetologist who has experience in telemetry.

Post-translocation, the snakes initially remained as a group within a similar area, particularly females, however, the males started to disperse further. In one site, comparisons were made between the movements of translocated and resident adders and both exhibited similar dispersal distances during the breeding season. Preferred habitats, such as ecotones were observed and those that acted as a barrier to movement, such as shorter grazed grassland. Overall, the findings were suggestive of normal behaviour and confirmed strong survivorship of the translocated individuals. Monitoring has started this year and several of the translocated adders have been recorded and evidence of breeding has been found. The aim is to collect further data to evaluate long-term trends.

In the wider landscape, dispersing reptiles across different receptor sites will diversify the gene pool and assist with adaptations to future environmental changes. Additionally, the aim is to share the findings with local organisations, other developers and records centre to ultimately benefit national reptile populations. As a result of the project, the team rapidly expanded their adder knowledge and handling skills and increased their understanding about how adders behave post-translocation to inform future strategies.



Map of movement of the tagged adders in one of the receptor sites

Slow worms and grass snake translocated to the receptor sites

Project Team

- Client(s)/funder(s) – National Highways/Kier
- Other design team members – Kier and Central Ecology
- Volunteer organisations

What was the motivation for carrying out the enhancement? (100 words max)

Reptiles in the UK, in particular adders, are facing large declines due to habitat loss and farming practices. We did not want to contribute to this pressure, therefore, to mitigate the impacts on reptiles, a large-scale translocation exercise was completed, alongside habitat enhancements. However, it was identified that there was a large knowledge gap on what happens to adder's post-translocation. With the use of telemetry, we could track the snakes to see how they responded to being moved to a new habitat and gain valuable information to help inform future mitigation regimes.