Blackthorn and Piddington

Piddinton, Cherwell, Oxfordshire, Southeast, England, OX25 1QF, UK

Murphy, Network Rail, NLG ecology

BIG Biodiversity Challenge Award Category: Habitat Creation: (Medium-scale biodiversity enhancement from 0.5 to 5ha)

Project overview

The Blackthorn and Piddington project in Oxfordshire addressed railway embankment instability, requiring slope regrading, drainage improvements, 3.7km road installation, landscaping and ecological enhancement. Works completed November 2023.

What were the biodiversity conditions on site prior to the enhancement?

Baseline data revealed a diverse array of habitats at Blackthorn and Piddington, including heathland and shrubs, sparsely vegetated land, grassland and rivers. The project's complexity was heightened by its location within a flood zone and a local wildlife site, requiring careful watercourse and ecological management.

Drone image during construction, 2022 (Mulholland)

What were the reasons behind this project?

The work was driven by Network Rail's commitment to biodiversity gain, aligning with its 2020 Biodiversity Action Plan and mitigation hierarchy. This protocol mandates identifying and managing biodiversity risks through avoidance, minimisation, restoration, and offsetting, aiming for net gain. Adherence to the Murphy "Never Harm" rule prevented environmental damage. Additional motivations were to meet government targets, discharge planning conditions, and address ecological needs in a local nature reserve and flood zone. These efforts ensured thorough consideration of biodiversity values, fostering ecologically valuable habitats, and setting a replicable model for future initiatives.

What were the biodiversity measures taken?

Railway embankments underwent a transformative process to mitigate habitat loss, with approximately **3.2 hectares designated for diverse replacement scrub planting and species-rich neutral grassland**. Ground preparation and tailored seed mixtures were meticulously executed to support Lepidoptera populations, ensuring habitat continuity for **hairstreak butterflies**.

Access roads and temporary compounds were rehabilitated post-construction, with topsoil preservation and reseeding initiatives implemented to minimise disruption. Over **6,000 metres of native hedgerows** with standard trees were strategically planted to promote habitat connectivity, while a ditch and hedge bank were created to diversify plant species and foster biodiversity.

Installation of topsoil, prior to seeding works

Post seeding works (Railway embankment**)**

Five wildlife ponds were intricately established to enhance habitat diversity and serve as thriving ecosystems for various species. Collaboratively positioned on land owned by the Berkshire, Buckinghamshire, and Oxon Wildlife Trust (BBOWT), these ponds maximised ecological impact and were safeguarded through meticulous measures, including stock fencing and reinforcement of adjacent hedgerows.

Watercourses underwent comprehensive enhancements to align with the Water Framework Directive (WFD) and mitigate impacts from proposed works. Scrub removal along Piddington Brook and reseeding initiatives promoted biodiversity, while gravel laying enhanced water oxygenation and invertebrate habitats. Coir rolls and stock-proof fencing were installed along the railway embankment and river Ray, respectively, to stabilise banks and protect riparian vegetation. **Aquatic plants** were planted inside 3.7km compensation ditch.

Overall, the metrics show that the habitat unit pre-works baseline for the project was 20.87. Post-works, this will rise to **22.95 units** achieved both on and offsite, which will result in a total habitat net gain of **10%.**

Further information

The installation process at Blackthorn and Piddington involved meticulous planning and execution. Following Network Rail's mitigation hierarchy, steps were taken to avoid, minimise, restore, and offset biodiversity impacts. This included careful site preparation, habitat creation, and species protection measures. Throughout, adherence to the Murphy "Never Harm" rule ensured environmental integrity.

Baseline data collection formed the foundation for monitoring, with post-installation assessments tracking changes in biodiversity indicators. Regular surveys and data analysis gauged the project's ecological impact and effectiveness in meeting its objectives. Legacy-wise, the project leaves behind enhanced habitats and a replicable model for future initiatives, showcasing sustainable development practices.

2 wildlife ponds on Network Rail land

Permanent Drainage ditch, hedgerow and evidence of aquatic plants

Notable increases in biodiversity have been observed, demonstrating successful achievement of objectives. Lessons learned include the importance of early engagement with stakeholders, robust monitoring protocols, and flexibility in adapting to site-specific challenges. Tips for similar schemes include prioritising habitat restoration, engaging local communities, and integrating biodiversity considerations into all project phases.

Taking this Biodiversity Challenge benefited the project team by fostering innovation, collaboration, and environmental stewardship. It provided a framework for setting ambitious biodiversity goals, driving the implementation of best practices, and achieving tangible conservation outcomes. Additionally, participation in the challenge enhanced the project's visibility, reputation, and alignment with broader sustainability initiatives.

Project Team

- Murphy
- Network rail
- NLG Ecology

What was the motivation for carrying out the enhancement?

The enhancement project at Blackthorn and Piddington stemmed from a dual commitment: addressing the persistent instability of railway embankments and advancing biodiversity goals. Chronic issues with embankment stability necessitated frequent repairs and speed reductions, prompting a proactive approach to stabilization. Concurrently, aligning with Network Rail's Biodiversity Action Plan and the Murphy "Never Harm" principle underscored a dedication to ecological preservation. By creatively managing various species and habitats, including badgers, reptiles, GCNs, grasslands, wetlands, and rivers, the project sought to not only stabilise infrastructure but also enrich and safeguard local ecosystems. This holistic approach aimed for lasting habitat improvement and overall environmental sustainability.

Grassland meadow post-seeding works (railway embankment)

1 of 5 Wildlife ponds, 12 months post works