

Beyond Habitat Mapping

Understanding Landscape Recovery at Court St Lawrence

TERRAVISO

An Environmental Intelligence Case Study (2020–2023)

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Executive Summary

Court St Lawrence: Measuring Landscape-Scale Biodiversity Recovery Through Environmental Intelligence

Court St Lawrence is a 155-acre (64-hectare) rural estate that has undergone a significant transition from conventional agricultural management to a landscape-scale ecological restoration and rewilding programme.

This study applies the TerraViso™ Environmental Intelligence Framework to quantify ecological change between 2020 and 2023 using habitat mapping, nature risk assessment, ecological network analysis, functional recovery modelling and biodiversity intelligence metrics.

This assessment was undertaken retrospectively using habitat baselines representing conditions in 2020 and 2023. The objective was to evaluate whether environmental intelligence techniques applied to the 2020 landscape would have identified the same ecological constraints, opportunities and recovery pathways that subsequently emerged through restoration and rewilding activities.

The objective was not simply to measure habitat extent, but to understand how ecological function, connectivity, resilience and biodiversity performance have changed through time.

Key Findings

Habitat Transformation

The most significant change observed across the site was the conversion of agriculturally managed grassland into species-rich meadow habitat.

Habitat Metric	2020	2023
Lowland Meadow	1.18 ha	44.40 ha
Meadow Gain	-	+43.22 ha
Modified Grassland	19.69 ha	0 ha
Woodland	9.14 ha	9.14 ha
Hedgerow Extent	Stable	Stable
Hedgerow Condition	Poor	Moderate

The habitat assessment demonstrates a fundamental shift from production-focused land management towards biodiversity-focused habitat restoration.

Ecological Network Development

The restoration programme has altered the way the landscape functions as an ecological system.

Ecological Network Analysis identified:

- 40 ecological corridors
- 74 ecological connections
- 4 Keystone Corridors
- Mean network connectivity degree of 3.7

These results indicate that Court St Lawrence now functions as a coherent ecological network rather than a collection of isolated habitat patches.

A small number of high-value Keystone Corridors were found to exert a disproportionate influence on overall ecological performance and represent strategic priorities for future management.

Functional Biodiversity Recovery

The analysis demonstrates substantial improvements in biodiversity performance across the landscape.

Indicator	2020	2023
Functional Biodiversity	15.56	39.50
Carbon-Biodiversity Coupling	13.92	34.45
Ecological Debt	76.90	37.40

Functional Biodiversity increased by approximately **154%**, while Ecological Debt reduced by approximately **51%**.

Pollinator recovery exhibited the strongest positive response, reflecting the extensive expansion of meadow habitat and increased habitat connectivity across the site.

These findings indicate that habitat restoration has translated into measurable ecological outcomes rather than simply increasing habitat extent.

Ecological Resilience and Recovery Potential

Adaptive Recovery Analysis revealed significant improvements in landscape resilience and long-term recovery potential.

Indicator	2020	2023
Resilience	28.34	53.93
Permeability	25.53	61.70
Fragmentation	82.10	27.74
Recovery Risk	57.06%	29.41%

Key outcomes include:

- Resilience increased by approximately **90%**
- Landscape permeability increased by approximately **142%**
- Fragmentation reduced by approximately **66%**
- Recovery Risk reduced by approximately **48%**

These changes indicate that the landscape is becoming increasingly capable of supporting biodiversity recovery and adapting to future environmental pressures.

Biodiversity Intelligence Assessment

The combined outputs from habitat mapping, ecological network analysis, functional recovery modelling and adaptive recovery assessment demonstrate a substantial increase in overall ecological performance.

The analysis indicates that Court St Lawrence has transitioned from a fragmented agricultural landscape with limited ecological connectivity into a functioning ecological network characterised by:

- Improved habitat quality
- Increased ecological connectivity
- Greater resilience
- Enhanced recovery potential
- Reduced ecological debt

Indicative TerraViso Biodiversity Intelligence™ (TVBI™) assessment suggests a transition from a relatively low-performing agricultural system in 2020 to a significantly more resilient and biodiverse landscape by 2023.

Conclusions

The Court St Lawrence case study demonstrates that landscape-scale ecological restoration can deliver measurable biodiversity gains within a relatively short period of time.
The results show that biodiversity recovery is driven not simply by creating habitat, but by improving the way habitats function together as an ecological system.

By integrating habitat assessment, ecological network analysis, functional recovery modelling and biodiversity intelligence, TerraViso provides a framework for quantifying ecological change and measuring nature recovery at the landscape scale.

Lowland Meadow	Fragmentation
+43.2 ha	-66%
Functional Biodiversity	Resilience
+154%	+90%

Court St Lawrence represents a compelling example of how environmental intelligence can be used to move beyond habitat mapping and towards a deeper understanding of ecological performance, resilience and biodiversity recovery.

2. Site Description

Court St Lawrence

Court St Lawrence is a 155-acre (approximately 64-hectare) rural estate located in the Welsh countryside. Historically managed as a conventional mixed farm, the site comprises a mosaic of agricultural fields, woodland blocks, hedgerows, ponds, streams and farm infrastructure set within a wider agricultural landscape.

Figure 1: Court St Lawrence Location Plan



The property occupies a gently undulating landscape characterised by interconnected field systems bounded by mature hedgerows and tree lines. Several water features, including ponds and watercourses, contribute to the ecological diversity of the site and provide important habitat resources and movement corridors for wildlife.

Prior to 2020, land management was primarily focused on agricultural production, with much of the site comprising improved and modified grassland managed for grazing and fodder production. Woodland and hedgerow habitats remained present across the farm but existed largely as isolated ecological features within an otherwise production-focused landscape.

In recent years, Court St Lawrence has undergone a significant transition towards landscape-scale ecological restoration and rewilding. Management objectives have shifted from maximising agricultural output towards enhancing biodiversity, improving ecological resilience, restoring natural processes and increasing the site's contribution to nature recovery within the wider landscape.

As part of this transition, large areas of agriculturally managed grassland have been allowed to develop into species-rich meadow habitats. Hedgerow management has been revised to improve structural diversity and ecological function, while existing woodland and aquatic habitats have been retained and integrated into a broader nature recovery strategy.

The site provides an ideal case study for evaluating the effectiveness of rewilding interventions because it contains a diverse range of habitat types and exhibits measurable ecological change over a relatively short period. The availability of high-resolution aerial imagery, terrain data and ecological intelligence analysis for both 2020 and 2023 enables a detailed assessment of how habitat extent, connectivity, resilience and biodiversity potential have evolved through time.

Assessment Objectives

The primary objectives of this study were to:

- Quantify habitat change between 2020 and 2023 using UK Habitat Classification (UKHab) mapping.
- Evaluate whether retrospective environmental intelligence analysis of the 2020 baseline corresponds with ecological recovery outcomes observed by 2023.
- Assess changes in ecological condition and habitat quality across the site.
- Evaluate the development of ecological connectivity and landscape function.
- Identify priority corridors and areas contributing disproportionately to ecological resilience.

- Measure functional biodiversity recovery and ecological performance.
- Assess long-term recovery potential under continued nature-focused management.
- Demonstrate how environmental intelligence can be used to quantify and monitor landscape-scale nature recovery.

Court St Lawrence therefore represents not only a rewilding project, but a living demonstration of how ecological intelligence can be applied to measure, understand and guide biodiversity recovery at the landscape scale.

3. Data and Methodology

Overview

This study was undertaken using TerraViso's Environmental Intelligence Framework to quantify ecological change at Court St Lawrence between 2020 and 2023. The assessment combines habitat mapping, environmental modelling, ecological network analysis and biodiversity intelligence to evaluate changes in ecological condition, connectivity, resilience and recovery potential across the site.

Unlike conventional habitat assessments that focus solely on habitat extent and classification, the TerraViso approach examines how habitats function as an integrated ecological system. This enables the assessment of not only what habitats are present, but how effectively the landscape supports biodiversity, ecological connectivity and long-term resilience.

Data Sources

Aerial Imagery[1]

High-resolution aerial imagery was used to establish habitat baselines for both assessment years.

Dataset	Resolution	Year
RGBN Aerial Imagery	0.125 m	2020
RGBN Aerial Imagery	0.125 m	2023

The imagery included Red, Green, Blue and Near Infrared (NIR) bands, enabling vegetation health and habitat condition analysis through spectral assessment.

Terrain Data[1]

Digital terrain products were incorporated into the analysis to provide information on habitat structure and landscape characteristics.

Dataset
Digital Surface Model (DSM)
Digital Terrain Model (DTM)
Canopy Height Model (CHM)
Slope Model

These datasets enabled the identification of woodland structure, hedgerows, scrub habitats and topographic influences on ecological connectivity.

[1] Supplied by Bluesky International Ltd

Ordnance Survey Data
Ordnance Survey MasterMap (OSMM) data were used to identify and classify non-habitat features and landscape infrastructure including:

- Buildings
- Roads and tracks
- Watercourses
- Ponds and open water

These features were incorporated into the habitat map using appropriate UK Habitat Classification (UKHab) codes to ensure complete landscape representation.

Field Verification

Site observations and local knowledge were used to verify habitat interpretation and inform habitat condition assessment. Particular attention was given to:

- Grassland management history
- Meadow restoration areas
- Hedgerow condition
- Woodland extent and structure
- Water features and riparian habitats

This information was used to refine habitat classifications and ensure that mapped outputs reflected current site conditions.

Habitat Mapping

Habitats were mapped using the UK Habitat Classification (UKHab) framework.
The process combined:

1. High-resolution aerial imagery interpretation.
2. Terrain and vegetation analysis.
3. OS MasterMap feature extraction.
4. Site verification and ecological interpretation.

Individual habitat polygons were created for:

- Woodland
- Grassland
- Meadow
- Hedgerow
- Watercourses
- Ponds
- Farm infrastructure

Field boundaries were digitised using visible hedgerows, fences, tracks and management boundaries. Hedgerows were treated as discrete habitat features and assigned separate habitat classifications where appropriate.

The resulting habitat maps provided the baseline datasets for both 2020 and 2023 and formed the foundation for all subsequent analyses.

Nature Risk Assessment

TerraViso Nature Risk analysis was applied to both habitat baselines to assess ecological vulnerability and opportunity across the landscape.
The model evaluates multiple ecological components including:

- Habitat fragmentation
- Connectivity
- Structural diversity
- Vegetation health
- Habitat condition
- Disturbance pressure

These factors were combined to generate a Nature Risk Score for each habitat unit and identify areas with the greatest potential for ecological improvement.

The outputs were subsequently classified into ecological opportunity types to support restoration planning and corridor development.

Ecological Corridor Analysis

Opportunity areas identified through the Nature Risk assessment were grouped into ecological restoration corridors.

The corridor analysis identifies:

- Habitat linkage opportunities
- Connectivity bottlenecks
- Restoration pathways
- Landscape-scale ecological flows

Each corridor was assessed for its contribution to ecological connectivity and its potential role in supporting species movement and ecosystem recovery.

Ecological Network Analysis

The ecological corridor network was converted into a graph-based ecological network consisting of nodes and edges representing habitat opportunities and ecological connections.
The analysis quantified:

- Network connectivity
- Corridor importance
- Keystone ecological corridors
- Restoration leverage
- Network resilience

This approach enables the identification of habitat features that disproportionately influence overall ecological performance.

Functional Recovery Modelling

Functional Recovery Analysis was undertaken to estimate how ecological restoration influences biodiversity outcomes over time.

The model evaluates recovery potential for multiple ecological guilds including:

- Pollinators
- Woodland birds
- Bats
- Amphibians
- Generalist species

Additional indicators include:

- Functional biodiversity
- Ecological debt
- Carbon-biodiversity coupling
- Recovery confidence
- Recovery risk

These outputs provide a measure of how effectively the landscape supports ecological function rather than simply habitat extent.

Adaptive Recovery and Resilience Analysis

Adaptive Recovery Analysis was used to model long-term ecological recovery dynamics and resilience under continued nature-focused management.

The assessment evaluates:

- Ecological resilience
- Landscape permeability
- Habitat fragmentation
- Spatial healing
- Recovery trajectories
- Ecological debt reduction

The results provide insight into the likely long-term performance of the landscape and its capacity to sustain biodiversity gains.

TerraViso Biodiversity Intelligence Framework

The outputs from habitat mapping, ecological network analysis, functional recovery and adaptive recovery were integrated within the TerraViso Biodiversity Intelligence Framework.

This framework evaluates biodiversity performance across five interconnected dimensions:

- Habitat Quality
- Connectivity
- Resilience
- Recovery Potential
- Ecological Context

Together, these measures provide a comprehensive assessment of ecological performance and enable direct comparison between baseline and restored landscapes.

The resulting analysis provides a data-driven assessment of ecological change at Court St Lawrence and demonstrates how environmental intelligence can be used to quantify biodiversity recovery at the landscape scale.

4. Habitat Change Analysis (2020–2023)

Overview

Court St Lawrence comprises approximately 64 hectares of mixed farmland, woodland, hedgerows, ponds and watercourses. Between 2020 and 2023 the site underwent a significant transition from conventional agricultural management towards a landscape-scale rewilding approach focused on ecological restoration, habitat enhancement and biodiversity recovery.

Habitat mapping was undertaken using high-resolution aerial imagery, terrain data and ecological interpretation to establish habitat baselines for both 2020 and 2023. Habitats were classified using the UK Habitat Classification (UKHab) framework, allowing direct comparison of habitat extent and condition between the two assessment years.

The analysis reveals substantial habitat transformation across the site, with large areas of agriculturally managed grassland transitioning to species-rich meadow habitats while maintaining existing woodland, hedgerow and aquatic features

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Habitat Extent Comparison

Habitat Type	2020 (ha)	2023 (ha)	Change (ha)
Lowland Meadow (g3a)	1.18	44.40	+43.22
Other Neutral Grassland (g3c)	0.00	7.54	+7.54
Neutral Grassland (g3)	31.06	0.00	-31.06
Modified Grassland (g4)	19.69	0.00	-19.69
Woodland	9.14	9.14	0.00
Native Hedgerow	0.97	0.97	0.00
Ponds, Streams and Farm Infrastructure	Stable	Stable	Minimal Change

Transition from Agricultural Grassland to Meadow Habitat

The most significant ecological change observed across the site was the conversion of agriculturally managed grassland to lowland meadow habitat.

In 2020, the landscape was dominated by neutral and modified grassland habitats associated with agricultural production and management. Lowland meadow habitat occupied only 1.18 hectares, representing a relatively small proportion of the overall site.

By 2023, lowland meadow habitat had expanded to 44.40 hectares, becoming the dominant habitat type across the farm. This represents a net gain of 43.22 hectares and reflects a fundamental shift in land management objectives from agricultural production towards biodiversity recovery and ecological restoration.

The increase in meadow habitat is particularly significant because lowland meadow is a priority habitat capable of supporting substantially greater botanical diversity, pollinator abundance and ecological function than agriculturally improved grassland systems.

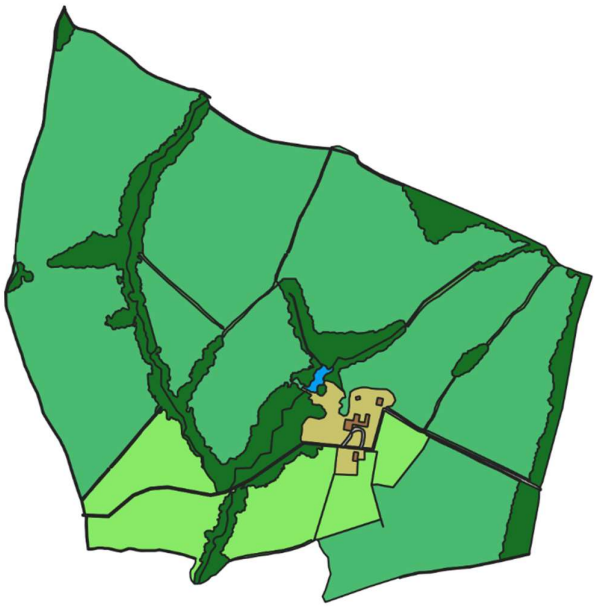
Figure 2: Habitat Map 2020



UKHab Classifications

- g3- Neutral grassland
- g3a- Lowland meadows
- g4- Modified grassland
- h2a- Native hedgerow
- r- Rivers and lakes
- r2b- Other rivers and streams
- u1b5- Buildings
- u1b6- Other development land
- u1d- Suburban mosaic of developed and natural surface
- w1f- Lowland mixed deciduous woodland

Figure 3: Habitat Map 2023



UK Habitat Classification

- g3a- Lowland meadows
- g3c- Other neutral grassland
- h2a- Native hedgerow
- r- Rivers and lakes
- r2b- Other rivers and streams
- u1b5- Buildings
- u1b6- Other development land
- u1d- Suburban mosaic of developed and natural surface
- w1f- Lowland mixed deciduous woodland

Woodland, Hedgerow and Aquatic Habitats

Existing woodland habitats remained stable throughout the assessment period, maintaining approximately 9.14 hectares of established woodland cover. These woodland areas continue to provide important structural diversity, habitat connectivity and ecological resilience across the site.

Native hedgerows also remained largely unchanged in extent. However, field observations indicate a measurable improvement in hedgerow condition between 2020 and 2023, with many hedgerows transitioning from poor condition to moderate condition. While the physical extent of the hedgerow network remained stable, improvements in structure and management are likely to have increased its ecological value and contribution to habitat connectivity.

Ponds, streams and associated riparian habitats remained present throughout the assessment period and continue to provide important ecological resources and movement corridors within the wider landscape.

Ecological Significance

The habitat changes observed between 2020 and 2023 represent more than a simple change in land cover. They reflect a substantial increase in habitat quality, ecological function and biodiversity potential across the site.

The replacement of modified agricultural grassland with extensive meadow habitat has increased habitat heterogeneity, improved opportunities for species movement and created the foundation for broader ecological recovery. Combined with improvements in hedgerow condition and the retention of existing woodland and aquatic habitats, these changes have established a more connected and resilient ecological network across the farm.
The habitat transformation recorded at Court St Lawrence provides the foundation for the subsequent ecological network, resilience and biodiversity intelligence analyses presented in this report.

5. Nature Risk and Ecological Opportunity Analysis

Overview

While habitat mapping provides a snapshot of the habitats present across a landscape, it does not reveal how effectively those habitats function as part of a wider ecological system. Two habitats of identical type may exhibit very different ecological performance depending on their condition, connectivity, structural diversity and position within the landscape.

To address this challenge, TerraViso Nature Risk Analysis was applied retrospectively to both the 2020 and 2023 habitat baselines. The objective was to evaluate ecological vulnerability, identify areas exhibiting ecological constraints and examine how these patterns relate to the ecological recovery subsequently observed across the site.

Rather than focusing solely on habitat classification, the analysis evaluates the underlying ecological performance of each habitat unit and its contribution to the wider landscape. This enables a more comprehensive understanding of how habitat condition, connectivity and ecological structure influence biodiversity outcomes.

Nature Risk Methodology

The TerraViso Nature Risk model evaluates a range of ecological factors that influence biodiversity performance and ecological resilience.

These include:

- Habitat fragmentation
- Ecological connectivity
- Structural diversity
- Vegetation condition
- Habitat complexity
- Disturbance pressure
- Landscape context
- Recovery potential

Each habitat unit is assessed against these factors and assigned a Nature Risk Score. Areas exhibiting poor connectivity, low structural diversity or elevated disturbance pressures are identified as higher-risk locations, while habitats demonstrating strong ecological function are identified as lower-risk areas.

The analysis also identifies ecological opportunity zones where habitat enhancement, restoration or connectivity improvements may offer significant potential for biodiversity gain.

Baseline Nature Risk Assessment (2020)

The 2020 assessment reflects the site's historical management as a working farm dominated by agriculturally managed grassland.

The Nature Risk analysis identified several characteristics typical of production-focused agricultural landscapes:

- High levels of habitat fragmentation.
- Limited ecological permeability between habitat areas.
- Restricted movement opportunities for wildlife.
- Concentration of ecological value within woodland, hedgerow and aquatic habitats.
- Relatively low functional diversity across large areas of managed grassland.

The 2020 assessment produced a mean Nature Risk Score of 28.0, with risk scores ranging from 1.3 to 97.9 across the site. Areas of greatest ecological value were concentrated within existing woodland, mature hedgerows and aquatic features, while the wider agricultural matrix contributed relatively little to overall ecological resilience.

The highest ecological vulnerability was concentrated around the farm complex and associated infrastructure, where habitat fragmentation, disturbance and limited ecological permeability reduced overall ecological performance. While such patterns are typical of working agricultural landscapes, they also highlight areas where ecological enhancement could potentially deliver biodiversity benefits.

Retrospective analysis of the 2020 baseline also identified a number of ecological bottlenecks where connectivity between habitat features was constrained. Comparison with the 2023

habitat baseline indicates that many of these locations subsequently experienced habitat enhancement, meadow establishment or improved ecological connectivity.

2020 Nature Risk Summary

Indicator	2020
Mean Nature Risk Score	28.0
Area Weighted Risk Score	10.6
High / Very High Risk Areas	10
Low / Very Low Risk Areas	63
Woodland Features Identified	37
Semi-Natural Habitat Features	61

Overall, the 2020 landscape exhibited characteristics consistent with a fragmented agricultural system containing a number of high-value ecological assets embedded within a relatively simplified land-use matrix.

Ecological Opportunity Analysis

A key output of the Nature Risk assessment is the identification of ecological opportunity zones.

These opportunity zones represent areas where ecological constraints, fragmentation or connectivity limitations suggest that habitat enhancement could potentially deliver substantial biodiversity benefits.

Within the context of this retrospective assessment, the opportunity analysis provides a means of evaluating whether locations identified as exhibiting elevated restoration potential in 2020 correspond with areas where ecological recovery was subsequently observed by 2023.

This approach enables the relationship between ecological opportunity and realised ecological outcomes to be examined using real-world habitat change data.

Landscape Transformation and Opportunity Realisation (2023)

By 2023, substantial habitat restoration had occurred across the site. Large areas of modified and agriculturally managed grassland had transitioned into lowland meadow habitats, while hedgerow condition and structural diversity had improved across much of the landscape.

These changes fundamentally altered the ecological structure of the farm.

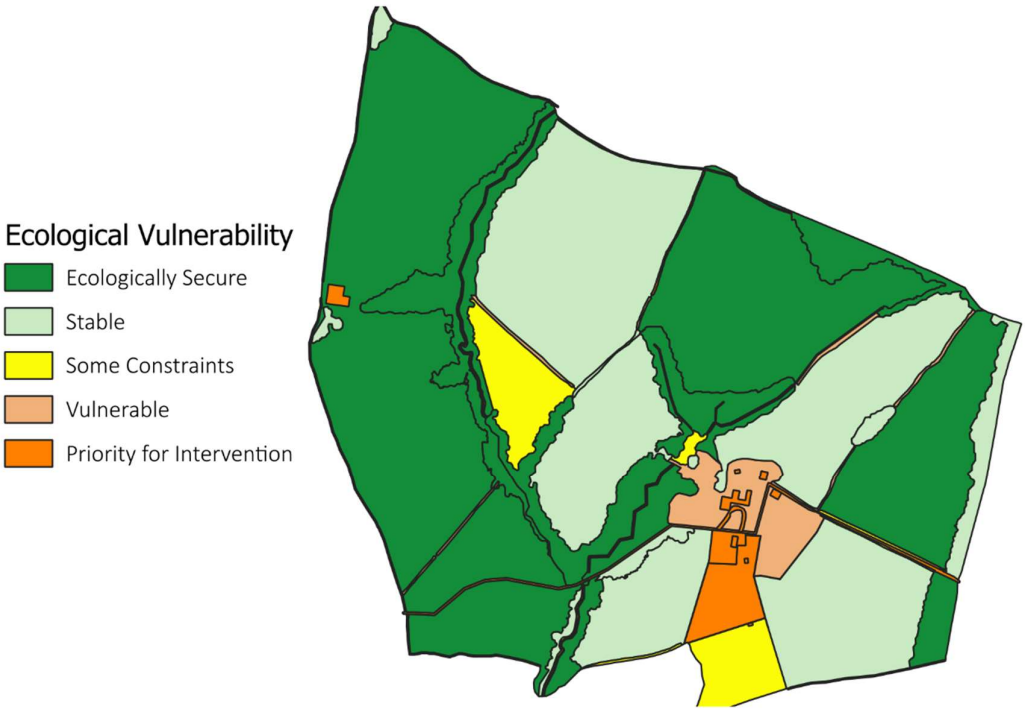
The expansion of meadow habitat increased ecological permeability across the landscape and reduced the isolation of existing woodland, hedgerow and aquatic habitats. Areas that previously exhibited ecological constraints became increasingly integrated within a broader network of semi-natural habitat.

Retrospective comparison of the 2020 and 2023 baselines indicates that many of the ecological opportunities identified within the 2020 landscape correspond closely with areas where habitat restoration, meadow creation and ecological recovery subsequently occurred.

The result is a landscape exhibiting lower ecological vulnerability, greater habitat connectivity and significantly enhanced biodiversity recovery potential.

Figure 4: Nature Risk and Ecological Vulnerability (2020)

Areas where habitat condition, fragmentation and ecological connectivity may constrain biodiversity performance.



What This Map Shows

This map identifies areas where ecological condition, fragmentation, connectivity or habitat quality may limit biodiversity performance. Higher scores indicate locations where targeted management could deliver significant ecological improvements.

Key Finding

The highest Nature Risk scores were concentrated around the farm complex and associated infrastructure. These areas exhibit higher levels of ecological disturbance, reduced habitat diversity and lower connectivity compared with the wider landscape.

Interpretation

This pattern is typical of working agricultural landscapes where operational infrastructure creates localised areas of ecological constraint. Importantly, these high-risk areas are spatially limited and do not significantly affect the wider ecological integrity of the estate.

Management Recommendation

Opportunities for ecological enhancement around the farm complex include wildlife-friendly landscaping, pollinator planting, native hedgerow strengthening, habitat-rich margins and improved connectivity between operational areas and surrounding semi-natural habitats.

Strategic Insights

It is important to note that the Nature Risk assessment was undertaken retrospectively and was not used to guide restoration activities at Court St Lawrence. The analysis therefore provides an opportunity to evaluate whether environmental intelligence techniques applied to the 2020 baseline would have identified the same areas of ecological constraint and opportunity that subsequently became focal points of biodiversity recovery.

The Nature Risk analysis highlights an important distinction between habitat presence and ecological performance.

While woodland, hedgerows and ponds represented the principal ecological assets in 2020, the surrounding agricultural matrix limited their ability to function as an integrated ecological system.

By 2023, habitat restoration had transformed the wider landscape from a collection of isolated ecological features into a more coherent and connected ecological network.

This shift is significant because ecological resilience is driven not only by the quality of individual habitats, but by the strength of the relationships between them.

The close correspondence between opportunity areas identified within the 2020 baseline and locations where ecological recovery subsequently occurred provides encouraging evidence that environmental intelligence approaches may have value in identifying landscapes capable of delivering substantial biodiversity gains.

The Nature Risk assessment therefore provides the bridge between traditional habitat mapping and the more advanced ecological network analyses presented in the following chapters.

Key Findings

- The 2020 landscape exhibited characteristics typical of a fragmented agricultural system with limited ecological permeability.
- Woodland, hedgerows and aquatic habitats represented the principal ecological assets across the site.
- Nature Risk analysis identified a series of ecological opportunity zones exhibiting elevated restoration potential.
- Areas exhibiting elevated ecological opportunity in the 2020 baseline correspond closely with locations where significant habitat restoration and meadow creation were subsequently undertaken.
- By 2023, the site exhibited substantially improved ecological connectivity, resilience and recovery potential.
- The Nature Risk assessment demonstrates that the ecological value of the landscape is determined not only by habitat extent, but by the way habitats function together as a connected system.

The outputs from the Nature Risk analysis form the foundation for the ecological corridor and network analyses presented in the next chapter.

6. Ecological Network Analysis

Overview

Healthy ecosystems are not defined solely by the quality of individual habitats. Their long-term resilience depends upon the degree to which habitats are connected and able to function collectively as an ecological network.

Species movement, genetic exchange, colonisation, climate adaptation and ecological recovery all depend upon the existence of connected habitat systems rather than isolated habitat patches.

The purpose of the Ecological Network Analysis was therefore to move beyond habitat mapping and examine how habitats interact across the wider Court St Lawrence landscape.

Using the outputs from the Nature Risk and Ecological Opportunity Analysis, TerraViso constructed a landscape-scale ecological network to identify key habitat linkages, ecological bottlenecks and priority restoration corridors.

From Habitat Patches to Ecological Networks

Traditional habitat mapping treats habitats as individual units.

Ecological Network Analysis instead treats the landscape as a connected system.
Within the TerraViso framework:

- Habitat opportunity areas become ecological nodes.
- Habitat linkages become ecological corridors.
- Connections between corridors form ecological pathways.
- The resulting network can be analysed using graph-based ecological modelling.

This approach enables the identification of:

- Critical habitat linkages.
- Connectivity bottlenecks.
- Ecological stepping stones.
- Keystone corridors.
- High-leverage restoration opportunities.

Most importantly, it allows biodiversity recovery to be assessed at the landscape scale rather than at the level of individual habitat parcels.

Court St Lawrence Ecological Network

The ecological network analysis identified a connected system of habitat corridors extending across the site.

The resulting network comprised:

Network Metric	Value
Ecological Corridors	40
Network Connections	74
Mean Network Degree	3.7
Keystone Corridors	4

The network demonstrates that Court St Lawrence functions as a coherent ecological system rather than a collection of isolated habitats.

Woodland blocks, hedgerow networks, meadow habitats and aquatic features collectively form the structural framework through which ecological processes operate.

Keystone Corridors

One of the most significant outputs from the analysis was the identification of four Keystone Corridors.

Keystone Corridors are habitat linkages that exert a disproportionately large influence on overall ecological performance.

Although they may occupy only a small proportion of the landscape, they provide critical functions including:

- Species movement.
- Network connectivity.
- Ecological resilience.
- Recovery propagation.
- Climate adaptation pathways.

The loss or degradation of a Keystone Corridor can result in significant reductions in ecological connectivity across the wider landscape.

Conversely, targeted enhancement of these corridors can generate ecological benefits far beyond their physical footprint.

Why Keystone Corridors Matter

The analysis demonstrated that a small number of habitat linkages contribute disproportionately to overall network performance.

These corridors act as ecological bridges connecting multiple habitat areas and enabling movement between woodland, meadow, hedgerow and aquatic habitats.

As a result, they represent the highest-value locations for future management and restoration investment.

Network Resilience

Network resilience describes the ability of a landscape to maintain ecological function despite disturbance or environmental change.

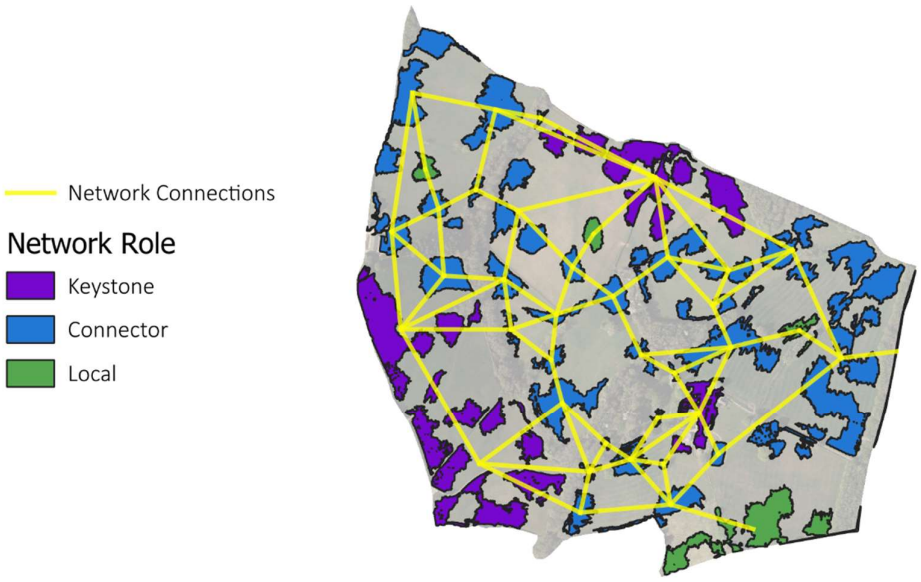
Resilient ecological networks possess:

- Multiple movement pathways.
- Redundant connections.
- Alternative habitat routes.
- Strong habitat connectivity.

The Court St Lawrence network exhibits characteristics associated with increasing resilience, particularly through the expansion of meadow habitat and improvements in hedgerow condition.

Figure 5: Ecological Network Structure (2023)

Network roles and ecological connections identified across the restored landscape.



What This Map Shows

This map illustrates the ecological network identified across Court St Lawrence in 2023. Corridors are classified according to their relative role within the network, highlighting keystone features, connector corridors and local habitat components. The connecting links show how ecological processes can move through the landscape.

Key Finding

The restored landscape supports a coherent ecological network containing a small number of highly influential corridors linked by a broader system of connector habitats. This network structure underpins the improvements observed in biodiversity performance, resilience and recovery potential.

Interpretation

The ecological network analysis demonstrates that Court St Lawrence now functions as an interconnected ecological system rather than a collection of isolated habitat patches. A small number of highly influential corridors act as structural anchors within the network, while a broader network of connector corridors facilitates ecological movement between woodland, meadow, hedgerow and riparian habitats. This interconnected structure increases ecological resilience and improves the ability of species and ecological processes to move through the landscape.

Management Recommendation

Maintain and protect the corridors identified as having the greatest influence on network connectivity. Continue to enhance hedgerows, field margins and habitat edges that link key habitat blocks and facilitate species movement.Ensure that restored meadow habitats remain connected to surrounding woodland, hedgerow and riparian habitats through appropriate management and sympathetic boundary treatment. Periodically reassess ecological connectivity to identify emerging bottlenecks, fragmentation pressures or opportunities for further enhancement. Focus future habitat creation and enhancement efforts within corridors that strengthen links between existing high-value habitats and keystone network features.

The creation of additional semi-natural habitat has reduced reliance on a small number of isolated habitat patches and increased the number of ecological pathways available to wildlife.

This diversification of ecological routes increases the likelihood that species can adapt to environmental pressures and continue to move through the landscape.

Restoration Leverage Analysis

A central concept within the TerraViso framework is Restoration Leverage.

Restoration Leverage measures the degree to which ecological improvements in one location influence the wider landscape.

Not all restoration opportunities are equal.

Some interventions produce highly localised benefits.

Others trigger improvements across extensive portions of the ecological network.

The analysis identified several high-leverage locations where relatively modest habitat enhancement could produce disproportionately large gains in connectivity and ecological resilience.
Examples include:

- Hedgerow enhancement at network bottlenecks.
- Meadow restoration adjacent to key corridor intersections.
- Habitat strengthening around aquatic features.
- Reinforcement of woodland-edge transition zones.

These areas represent strategic intervention points where investment can maximise ecological return.

Connectivity and Landscape Function

The ecological network highlights an important shift that occurred between 2020 and 2023. Historically, ecological value within the landscape was concentrated within woodland, hedgerows and aquatic habitats, with much of the surrounding agricultural land functioning as a barrier to ecological movement.

The transition to species-rich meadow habitat fundamentally altered this relationship. Meadow restoration transformed large areas of the site from low-connectivity matrix habitat into active components of the ecological network.

As a result:

- Habitat permeability increased.
- Ecological isolation decreased.
- Connectivity between habitat blocks improved.
- Species movement opportunities expanded.

The landscape began to function as an integrated ecological system rather than a series of disconnected habitat fragments.

Key Findings

- Forty ecological corridors were identified across the site.
- Seventy-four functional ecological connections link these corridors into a coherent network.
- Four Keystone Corridors were identified as critical components of landscape connectivity.
- Meadow restoration substantially increased network connectivity and ecological permeability.
- Habitat improvements reduced ecological isolation and strengthened ecological resilience.
- Restoration Leverage analysis identified strategic intervention points capable of generating disproportionately large biodiversity gains.

The Ecological Network Analysis demonstrates that the ecological transformation at Court St Lawrence extends beyond habitat creation alone. Habitat restoration has fundamentally altered the way the landscape functions, creating a more connected, resilient and ecologically coherent system.

The next chapter examines how these structural improvements translate into measurable biodiversity outcomes through Functional Recovery Analysis.

7. Functional Recovery Analysis

Overview

Habitat restoration alone does not guarantee biodiversity recovery.

While habitat creation and connectivity improvements provide the conditions necessary for ecological recovery, the ultimate objective is the restoration of ecological function. A landscape may contain large areas of habitat yet still fail to support healthy ecological processes if those habitats are fragmented, isolated or structurally simplified.

To evaluate the biological consequences of landscape restoration, TerraViso Functional Recovery Analysis was applied to both the 2020 and 2023 ecological networks.

The purpose of the analysis was to quantify how effectively the landscape supports key ecological functions and to estimate the potential for long-term biodiversity recovery.

Unlike traditional habitat assessments, which primarily measure habitat extent, Functional Recovery Analysis evaluates how species groups interact with the landscape and how ecological function develops through time.

Functional Recovery Framework

The TerraViso Functional Recovery Model evaluates recovery potential across multiple ecological guilds that collectively represent different aspects of biodiversity performance. These guilds include:

- Pollinators
- Woodland Birds
- Bats
- Amphibians

- Generalist Species

Each guild responds differently to habitat quality, structural diversity, connectivity and ecological resilience.

By modelling multiple guilds simultaneously, the analysis provides a more comprehensive understanding of biodiversity recovery than would be possible through single-species assessments.

The model also evaluates broader ecological indicators including:

- Functional Biodiversity
- Ecological Debt
- Carbon-Biodiversity Coupling
- Recovery Confidence
- Recovery Risk

Together these indicators provide an assessment of the ecological performance of the landscape as a whole.

Baseline Functional Performance (2020)

The 2020 assessment reflects a landscape still dominated by agriculturally managed grassland. Although woodland, hedgerows and aquatic habitats provided important ecological resources, the wider landscape offered relatively limited opportunities for ecological movement and species expansion.

The Functional Recovery Analysis indicates that ecological performance was constrained by:

- High habitat fragmentation.
- Limited ecological permeability.
- Restricted habitat diversity.
- Reduced opportunities for species dispersal.
- Low landscape-scale ecological resilience.

The resulting functional biodiversity score was 15.6, indicating a relatively low level of ecological functionality across the wider landscape.

Similarly, carbon-biodiversity coupling was limited, suggesting that ecological and ecosystem-service benefits were not yet operating at their full potential.

2020 Functional Recovery Metrics

Indicator	2020
Functional Biodiversity	15.56
Carbon-Biodiversity Coupling	13.92
Ecological Debt	76.90
Recovery Confidence	61.24%
Recovery Risk	61.23%

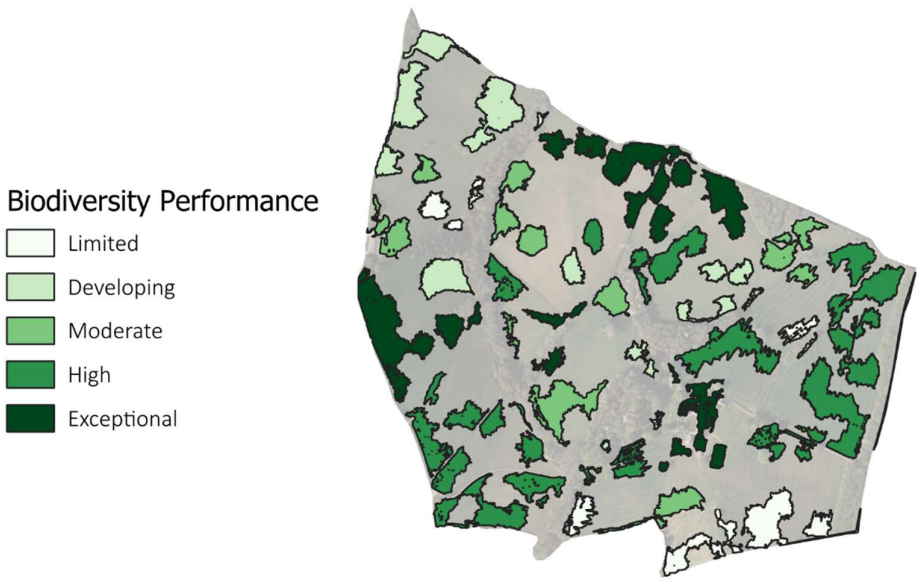
The analysis suggests that, while important ecological assets existed across the site, much of the landscape remained ecologically underperforming relative to its potential.

Functional Recovery Following Rewilding (2023)

By 2023, the ecological structure of the site had changed substantially.
Large-scale meadow creation, improved hedgerow condition and enhanced habitat connectivity transformed the landscape from a predominantly agricultural system into a more diverse and interconnected ecological network.

Figure 6: Functional Biodiversity Performance

Ability of ecological corridors to support multiple ecological processes and species groups



What this map shows

Functional biodiversity measures how effectively habitats support pollination, species movement, ecological resilience and ecosystem functioning.

Key Findings

Highest scores occur within the largest meadow complexes.
Biodiversity function is strongest where connectivity is highest.
Restoration has increased ecological performance beyond habitat extent alone.

Management Recommendations

Maintain high-performing meadow habitats.
Improve connectivity between moderate-performing corridors.
Prioritise enhancement of lower-scoring areas.

The Functional Recovery Analysis indicates that these changes generated significant improvements across multiple ecological indicators.

2023 Functional Recovery Metrics

Indicator	2023
Functional Biodiversity	39.50
Carbon-Biodiversity Coupling	34.45
Ecological Debt	37.40
Recovery Confidence	66.92%
Recovery Risk	29.41%

The increase in Functional Biodiversity demonstrates that the landscape is now capable of supporting a substantially broader range of ecological processes and species interactions. At the same time, ecological debt has reduced dramatically, indicating that many of the ecological deficits present in the 2020 landscape have been partially repaired through habitat restoration and improved connectivity.

Guild Recovery Assessment

Pollinators

Pollinators exhibited the strongest recovery response across all ecological guilds. The extensive expansion of meadow habitat created large areas of flowering vegetation and foraging resources, significantly increasing habitat suitability and ecological connectivity for pollinating insects.

The recovery of pollinator habitat is particularly important because pollinators provide critical ecosystem services and contribute to the resilience of wider ecological communities.

Woodland Birds

Although woodland extent remained largely unchanged between 2020 and 2023, improvements in landscape connectivity enhanced the ecological value of existing woodland habitats.

The increased availability of meadow and hedgerow habitat created a more connected matrix surrounding woodland blocks, improving movement opportunities and reducing habitat isolation.

Bats

Bat recovery benefited from improvements in habitat connectivity and landscape permeability. Enhanced hedgerow structure and expanded semi-natural habitat provide improved commuting routes and foraging opportunities, strengthening the ecological function of the wider landscape.

Amphibians

Aquatic habitats remained stable throughout the assessment period; however, improvements in habitat connectivity increased the potential for movement between breeding, foraging and refuge habitats.

The resulting increase in ecological permeability supports more resilient amphibian populations across the landscape.

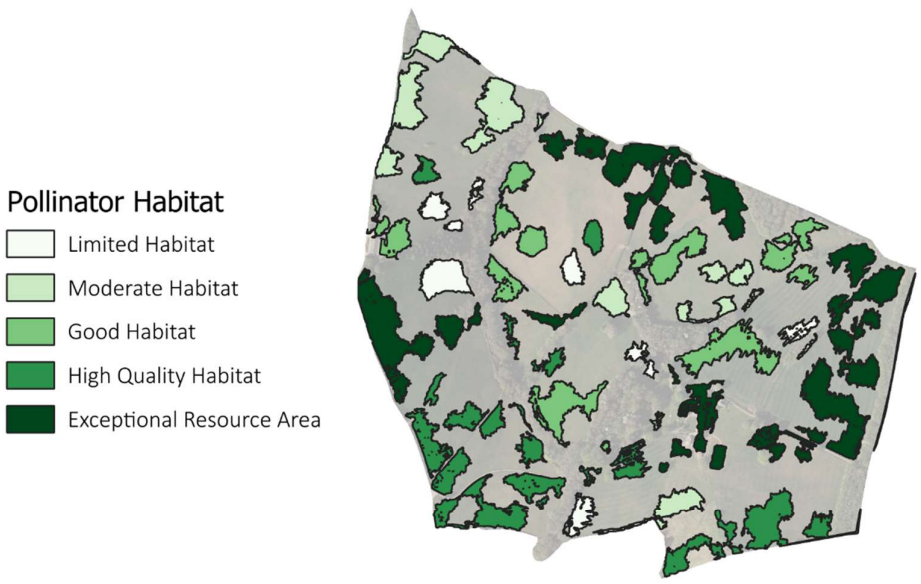
Generalist Species

Generalist species responded positively to the overall increase in habitat diversity and structural complexity.

These species often provide an early indicator of improving ecological function and can act as a precursor to broader biodiversity recovery.

Figure 7: Pollinator Habitat Suitability

Relative suitability of ecological corridors for supporting pollinator communities.



What this map shows

This map highlights the ecological corridors most likely to support diverse pollinator communities including bees, butterflies and other beneficial insects.

Key Findings

Meadow restoration has generated extensive areas of high-quality pollinator habitat.
Pollinator suitability closely aligns with meadow extent and habitat connectivity.
Several corridors now function as landscape-scale pollinator resource hubs.

Management Recommendations

Continue meadow management for flowering diversity.
Maintain habitat connectivity between pollinator hubs.
Enhance field margins adjacent to moderate-scoring corridors.

Functional Biodiversity and Ecological Debt

One of the most significant outcomes of the analysis was the increase in Functional Biodiversity.

Functional Biodiversity increased from:

15.56 → 39.50

This represents an increase of approximately 154%.

At the same time, Ecological Debt decreased from:

76.90 → 37.40

representing a reduction of approximately 51%.

These results indicate that the landscape is no longer functioning below its ecological potential to the same extent observed in 2020.

Instead, ecological processes are becoming increasingly established and self-reinforcing.

Carbon-Biodiversity Coupling

The analysis also identified a substantial increase in Carbon-Biodiversity Coupling. Carbon-Biodiversity Coupling measures the extent to which biodiversity recovery and wider ecosystem service delivery occur simultaneously.

The score increased from:

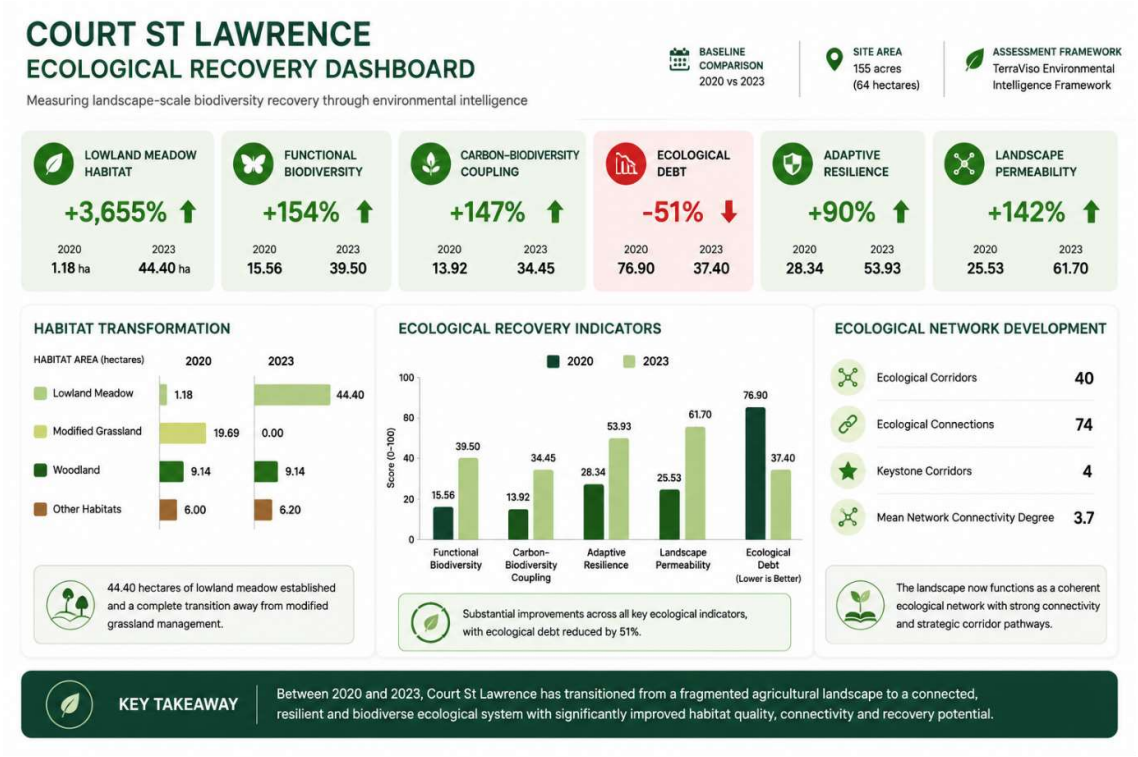
13.92 → 34.45

This suggests that habitat restoration is delivering multiple environmental benefits simultaneously, including biodiversity enhancement, ecological resilience and natural capital improvement.

Such outcomes are particularly important when evaluating the long-term sustainability of landscape restoration initiatives.

Key Findings

- Functional Biodiversity increased from 15.56 to 39.50.
- Ecological Debt reduced by approximately 51%.
- Carbon-Biodiversity Coupling increased from 13.92 to 34.45.
- Pollinators exhibited the strongest functional recovery response.
- Improvements were recorded across woodland bird, bat, amphibian and generalist species guilds.
- Recovery Confidence increased while Recovery Risk decreased substantially.
- Habitat restoration and improved connectivity have translated into measurable biodiversity outcomes rather than simply increasing habitat extent.



The Functional Recovery Analysis demonstrates that ecological restoration at Court St Lawrence has generated significant improvements in biodiversity performance and ecological function. These changes provide strong evidence that the landscape is transitioning from a fragmented agricultural system towards a resilient and ecologically productive nature recovery landscape.

The next chapter examines how these gains influence long-term resilience, adaptation and recovery potential through Adaptive Recovery Analysis.

8. Adaptive Recovery and Ecological Resilience Analysis

Overview

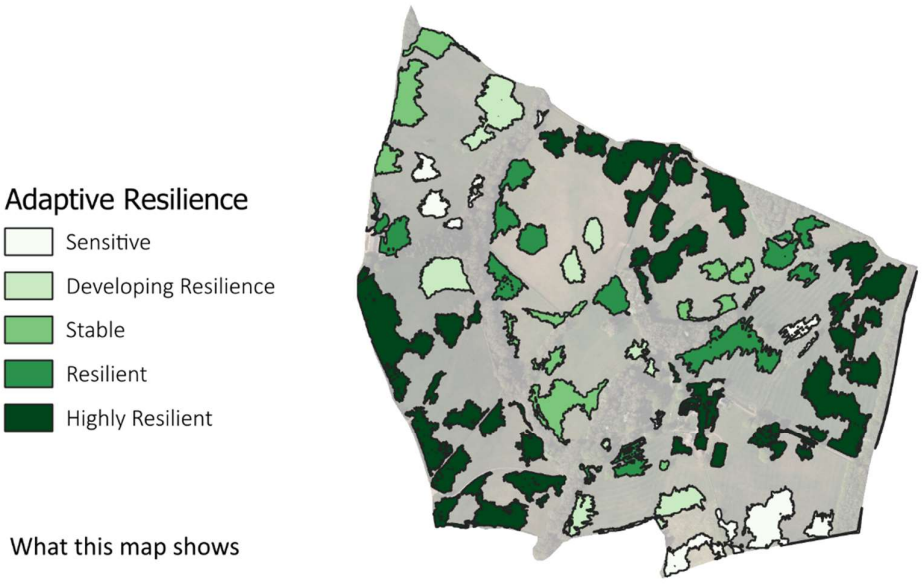
Ecological restoration is not simply about improving current habitat conditions. The ultimate measure of success is whether a landscape can sustain biodiversity, recover from disturbance and continue to adapt as environmental conditions change.

To evaluate this capability, TerraViso Adaptive Recovery Analysis was applied to the Court St Lawrence ecological network.

The analysis models how ecological recovery propagates through the landscape over time, identifies barriers to recovery and quantifies the resilience of the ecological network under future conditions.

Figure 8: Landscape Resilience to Environmental Change (2023)

Adaptive resilience scores derived from TerraViso recovery modelling, illustrating the ability of ecological corridors to sustain biodiversity function, absorb disturbance and support long-term ecological recovery across the Court St Lawrence estate.



What this map shows

This map illustrates the resilience of ecological corridors across Court St Lawrence. Adaptive resilience reflects the ability of habitats and ecological networks to absorb disturbance, maintain ecological function and continue supporting biodiversity through time. Higher scores indicate ecological corridors that are better connected, structurally diverse and capable of sustaining ecological recovery under future environmental pressures.

Interpretation

The highest resilience scores are concentrated within the restored meadow network and associated semi-natural habitats. These areas now form the core of a connected ecological system capable of supporting biodiversity recovery and maintaining ecological function despite environmental change. Areas exhibiting lower resilience are generally associated with isolated habitat patches or locations where connectivity remains constrained.

Key Findings

Habitat restoration between 2020 and 2023 has substantially increased landscape resilience across the estate. The restored meadow network has transformed previously fragmented habitats into a more coherent and adaptive ecological system capable of supporting long-term biodiversity recovery.

Management Recommendations

Continue management practices that maintain habitat diversity and ecological connectivity. Particular attention should be given to strengthening links between highly resilient corridors and neighbouring habitats to further increase landscape-scale resilience.

Why This Matters

Ecological resilience is increasingly recognised as a critical measure of biodiversity recovery because resilient landscapes are better able to withstand disturbance, adapt to environmental change and sustain ecological function over the long term.

From Recovery to Resilience

Traditional ecological assessments often provide a static snapshot of ecological condition. Adaptive Recovery Analysis instead evaluates how ecological systems behave dynamically through time.

The assessment considers:

- Ecological resilience
- Landscape permeability
- Habitat fragmentation
- Recovery propagation
- Ecological debt
- Spatial healing
- Recovery confidence
- Recovery risk

Together, these indicators provide insight into the long-term sustainability of biodiversity recovery.

Adaptive Recovery Results

The comparison between 2020 and 2023 reveals a substantial improvement in ecological resilience and recovery potential.

Indicator	2020	2023	Change
Resilience	28.34	53.93	+25.59
Permeability	25.53	61.70	+36.17
Fragmentation	82.10	27.74	-54.36
Spatial Healing Gain	3.87	6.91	+3.04
Ecological Debt	77.12	37.63	-39.49
Recovery Confidence	73.23%	68.49%	Stable
Recovery Risk	57.06%	29.41%	-27.65%

These results demonstrate a profound improvement in the ecological functioning of the landscape.

Reduced Fragmentation

The most significant change observed was a reduction in ecological fragmentation. Fragmentation decreased from:

82.10 → 27.74

This indicates that habitats previously functioning as isolated ecological units have become increasingly integrated into a connected ecological system.

Reduced fragmentation improves:

- Species movement
- Genetic exchange
- Colonisation opportunities
- Ecosystem resilience

and is one of the strongest indicators of successful landscape-scale restoration.

Increased Landscape Permeability

Landscape permeability increased from:

25.53 → 61.70

This increase reflects the transition from a production-focused agricultural landscape to a semi-natural habitat mosaic capable of supporting ecological movement.

Improved permeability enables wildlife to move more freely between habitat areas and allows ecological processes to operate across larger spatial scales.

Recovery Confidence and Risk

Recovery Confidence remained high throughout the modelling process while Recovery Risk reduced substantially.

This indicates that the restoration measures implemented across the site are producing consistent ecological benefits and reducing the likelihood of future ecological decline.

The analysis suggests that biodiversity gains achieved since 2020 are increasingly likely to persist and strengthen over time.

Resilience and Future Recovery Potential

The increase in resilience demonstrates that the Court St Lawrence landscape is becoming progressively more capable of absorbing environmental pressures and continuing to support biodiversity.

This resilience is derived not from any single habitat but from the interaction of:

- Woodland habitats
- Meadow systems
- Hedgerow networks
- Aquatic features
- Ecological corridors

Together these habitats form a more adaptive and self-supporting ecological system.

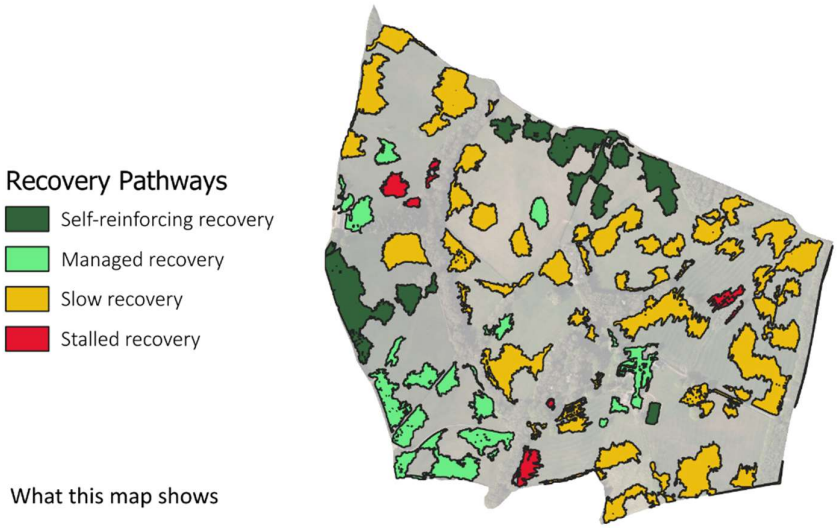
Key Findings

- Ecological resilience increased by over 90%.
- Landscape permeability more than doubled.
- Fragmentation reduced by approximately 66%.
- Ecological debt reduced substantially.
- Recovery risk decreased significantly.
- The landscape exhibits increasing capacity for long-term ecological recovery.

The Adaptive Recovery Analysis indicates that Court St Lawrence is not only more biodiverse than it was in 2020 but is also substantially more capable of sustaining biodiversity gains into the future.

Figure 9: Predicted Ecological Recovery Pathways

Expected recovery behaviour of ecological corridors under continued nature-focused management.



What this map shows

This map classifies ecological corridors according to their predicted recovery pathway. Corridors classified as Self are expected to continue improving through natural ecological processes, while Managed corridors remain dependent upon ongoing habitat management. Slow and Stalled corridors represent areas where ecological recovery is limited by habitat condition, connectivity constraints or other ecological barriers.

Interpretation

Self-reinforcing recovery: These are your ecological success stories. These corridors have effectively become recovery engines within the wider landscape. They should be protected and monitored rather than heavily intervened in.

Managed recovery: These corridors are recovering successfully but remain dependent on current management practices. Stopping management could reduce future recovery potential.

Slow recovery: Recovery is occurring but at a limited rate. These are often good candidates for targeted enhancement.

Stalled recovery: These represent your highest-priority intervention areas. hey are the places where the ecological network is not responding as effectively as expected.

Key Findings

The majority of ecological corridors at Court St Lawrence are following either Self or Managed recovery pathways, indicating that restoration efforts are successfully driving ecological improvement across much of the landscape. A smaller number of Slow and Stalled corridors remain, representing opportunities for targeted intervention to further strengthen ecological resilience and connectivity.

Management Recommendations

Protect Self-recovery corridors as core ecological assets.

Maintain existing management within Managed corridors to ensure continued ecological improvement.

Prioritise Slow and Stalled corridors for targeted habitat enhancement, connectivity improvements and ongoing monitoring.

9. TerraViso Biodiversity Intelligence Index (TVBI)

Overview

The TerraViso Biodiversity Intelligence Index (TVBI) provides a holistic measure of ecological performance by integrating habitat quality, connectivity, resilience, recovery potential and ecological context into a single biodiversity intelligence framework.
Unlike traditional biodiversity metrics that focus on individual habitats or species groups, TVBI evaluates how effectively an entire landscape functions as an ecological system.

The Five Pillars of Biodiversity Performance

TVBI assesses biodiversity performance across five interconnected dimensions:

Habitat Quality
The condition, diversity and ecological value of habitats across the landscape.
Connectivity
The degree to which habitats are linked and capable of supporting ecological movement.
Resilience
The ability of the ecological network to withstand disturbance and maintain function.
Recovery Potential
The capacity of the landscape to support future biodiversity recovery.
Ecological Context
The contribution of each habitat to the wider ecological system.

TVBI Interpretation

The analyses undertaken at Court St Lawrence demonstrate substantial improvements across all five dimensions.

The transformation from agriculturally managed grassland to extensive meadow habitat, combined with improvements in hedgerow condition and ecological connectivity, has generated measurable gains in ecological performance.

The ecological intelligence outputs indicate that Court St Lawrence has transitioned from a fragmented agricultural landscape towards a connected and resilient nature recovery system.

Indicative TVBI assessment suggests:

Assessment Year	Indicative TVBI
2020	25–35
2023	60–75

While the precise TVBI value will evolve as additional ecological intelligence layers are incorporated, the relative improvement is clear and substantial.

What the TVBI Results Mean

The increase in TVBI reflects improvements in:

- Habitat quality
- Ecological connectivity
- Network resilience
- Functional biodiversity
- Long-term recovery potential

Importantly, these gains have not been driven by a single intervention but by a coordinated landscape-scale approach to ecological restoration.

The results demonstrate that biodiversity recovery is most effective when habitats function together as an integrated ecological system.

Key Findings

- Biodiversity performance increased substantially between 2020 and 2023.
- Connectivity and resilience improvements contributed significantly to overall gains.
- Meadow restoration delivered both habitat and network-level benefits.
- The site now functions as a coherent ecological system rather than a collection of isolated habitat patches.
- Court St Lawrence demonstrates the value of landscape-scale nature recovery supported by environmental intelligence.

10. Conclusions and Recommendations

Conclusions

Between 2020 and 2023, Court St Lawrence underwent a substantial ecological transformation.

The site transitioned from a predominantly agricultural landscape characterised by modified and neutral grassland habitats to a significantly more diverse and ecologically connected system centred around lowland meadow restoration and improved habitat condition.

The analysis demonstrates that:

- Lowland meadow habitat increased by more than 43 hectares.
- Habitat connectivity improved substantially.
- Ecological fragmentation reduced dramatically.
- Functional biodiversity more than doubled.
- Ecological debt reduced by approximately 50%.
- Landscape resilience increased significantly.

The ecological improvements observed extend beyond habitat creation alone. Habitat restoration has fundamentally altered the way the landscape functions, creating a more connected, resilient and adaptive ecological network.

Retrospective Validation of Environmental Intelligence

A particularly significant outcome of this study is that retrospective analysis of the 2020 landscape identified many of the same ecological opportunities that subsequently became focal points of biodiversity recovery.

Areas exhibiting elevated ecological risk, fragmentation and connectivity constraints within the 2020 baseline correspond closely with locations where habitat enhancement delivered measurable ecological gains by 2023. In particular, areas identified as offering strong restoration opportunity subsequently formed part of the restored meadow network and associated ecological corridors that now underpin landscape connectivity and resilience across the site.

While the restoration programme itself was not informed by TerraViso analysis, the results suggest that environmental intelligence approaches may have considerable value in identifying landscapes capable of delivering substantial biodiversity recovery. Court St Lawrence therefore provides not only evidence of ecological improvement, but also an initial real-world validation of the analytical principles underpinning the TerraViso platform.

Recommendations

Continue Meadow Management
Maintain and refine meadow management practices to support botanical diversity and pollinator recovery.

Strengthen Keystone Corridors
Prioritise management of identified Keystone Corridors to maximise ecological return on investment.

Enhance Hedgerow Structure
Continue hedgerow enhancement and sympathetic management to strengthen connectivity and species movement.

Monitor Ecological Recovery
Repeat habitat, network and biodiversity intelligence assessments periodically to track ecological change.

Expand Environmental Intelligence Monitoring
Use TVBI and associated ecological intelligence indicators as long-term measures of biodiversity performance and recovery.

Final Observation

Court St Lawrence demonstrates how landscape-scale ecological restoration can generate measurable improvements in biodiversity performance, ecological resilience and recovery potential.

The project illustrates the value of moving beyond habitat mapping alone and adopting an environmental intelligence approach that measures how landscapes function as integrated ecological systems.

The results provide strong evidence that strategic habitat restoration, supported by ecological intelligence, can deliver meaningful and quantifiable biodiversity recovery within a relatively short period of time.

About TerraViso

TerraViso is a developing ecological intelligence platform focused on AI-assisted habitat understanding, ecological fingerprinting, landscape connectivity analysis, resilience modelling, and scenario-based environmental planning.

The platform is being developed around the principle that ecological systems should be analysed as dynamic, interconnected landscapes rather than isolated spatial features.

TerraViso combines remote sensing, spatial analysis, environmental modelling, ecological network analysis, and artificial intelligence to support emerging approaches to biodiversity intelligence.

Continue the Conversation

If you'd like to discuss:

- Ecological Intelligence
- Biodiversity Technology
- Nature Recovery
- Ecological Fingerprinting Intelligence
- TerraViso Partnerships

Contact:

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Appendix A – Biodiversity Net Gain (BNG) Context

What is Biodiversity Net Gain?

Biodiversity Net Gain (BNG) is a statutory framework introduced under the Environment Act 2021 requiring most developments in England to leave biodiversity in a measurably better state than before development.

The approach uses the Statutory Biodiversity Metric to calculate biodiversity units based on habitat type, habitat condition, distinctiveness, strategic significance and habitat area. The resulting biodiversity units provide a standardised measure of habitat value that can be compared through time.

Although Biodiversity Net Gain was originally developed to assess development impacts, the framework also provides a useful reference for evaluating ecological change within restoration and land management projects.

BNG Assessment Approach

Indicative biodiversity units were calculated for the Court St Lawrence habitat baselines representing conditions in 2020 and 2023.

The calculation considered:

- Habitat type (UK Habitat Classification)
- Habitat area
- Habitat condition
- Habitat distinctiveness
- Strategic significance
- Habitat connectivity and ecological context

The resulting unit values provide a standardised measure of biodiversity value at each point in time.

Indicative Biodiversity Units

Year	Biodiversity Units
2020	914.92
2023	947.56
Net Gain	+32.64
Percentage Gain	+3.57%

The results indicate an overall increase in biodiversity value between 2020 and 2023, reflecting the transition from agriculturally managed grassland towards a more diverse landscape containing substantially larger areas of lowland meadow and improved semi-natural habitat.

Interpreting the Results

The increase of 32.64 biodiversity units demonstrates that ecological restoration undertaken at Court St Lawrence generated a measurable improvement in biodiversity value under the Biodiversity Net Gain framework.

However, the relatively modest percentage increase compared with the scale of ecological change observed elsewhere in this report highlights an important characteristic of biodiversity unit accounting.

BNG primarily measures habitat extent, habitat condition and habitat distinctiveness. While these factors are important, they do not fully capture broader ecological processes such as:

- Landscape connectivity
- Ecological resilience
- Species movement
- Functional biodiversity
- Recovery potential
- Network structure

As a result, substantial improvements in ecological function may not always be reflected proportionally within biodiversity unit calculations.

Beyond Biodiversity Units

The wider analyses presented within this report indicate that ecological recovery at Court St Lawrence extends beyond habitat creation alone.

Between 2020 and 2023 the site experienced:

- A substantial increase in lowland meadow habitat.
- Reduced habitat fragmentation.
- Improved ecological connectivity.
- Increased functional biodiversity.
- Reduced ecological debt.
- Enhanced landscape resilience.

These changes demonstrate that while biodiversity units provide a valuable standardised measure of habitat value, they represent only one dimension of ecological performance.

The TerraViso Environmental Intelligence Framework complements biodiversity unit assessment by evaluating how habitats function together as an ecological system and how ecological recovery influences long-term biodiversity outcomes.

Key Insight

The Court St Lawrence restoration programme generated a measurable Biodiversity Net Gain of 32.64 units (+3.57%). However, environmental intelligence analysis suggests that the ecological benefits achieved extend significantly beyond what biodiversity units alone are able to capture.

This highlights the importance of combining habitat-based accounting frameworks with measures of ecological function, connectivity, resilience and recovery when evaluating landscape-scale nature recovery projects.



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