PROJECT REPORT and Non Technical Summary

Mawley Hall LLP

Report

Baseline: year to 31st December 2025

Beyond Zero
hello@beyondzero.ag

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Project Aims, Description, and Scope

Mawley Hall LLP is the legal entity that owns this project. The land spans several original estates that have been merged into two main management units, which for the sake of this report shall be referred to as Wiltshire and Shropshire.

Beyond Zero have been appointed to conduct a full project process, creating baselines, placing all data onto a single dashboard and putting the project through UK Carbon Code of Conduct (UKCCC) approval.

The estate's Principle is motivated to change the way the land is managed to ensure its future is not only as a beautiful place but also a nature abundant and climate positive place.

Project Aims

The Mawley Hall LLP project has several key aims:

- To understand its baseline scenario
- To deliver a Net Zero and beyond pathway
- To restore habitats, restore original estate features and to create new woodland, hedgerows and remove carbon
- To optimise carbon credit issuance for external sale.

Project Description

Wiltshire Estate

Doug Wanstall and Ian Gould from Beyond Zero visited the entire estate on the 22nd and 23rd April 2026 and were accompanied by Oliver Scott the Farms Director. The land in Wiltshire has been created by the amalgamation of two smaller estates and various blocks of land. The estate Principle has a significant interest in restoring nature and making the estate a place of beauty and biodiversity abundance and it is clear across the estate and its activities that this is the remit and goal of the management team.

Arable land is managed under a contract farming agreement (CFA) with a traditional operator. There are a significant number of wild bird seed, pollen and nectar plots. Some Wild Farmed crops are grown where inputs are reduced, field margins put in place and companion crops grown alongside the cash crop. Soils were dry and hard at the time of the visit with stone fractions present in places.

Cover crops are grown across the estate with stubble turnips making up a significant proportion. There is extensive use of AHL2 and NUM3 SFI options on arable land reversion.

Soil organic carbon levels are relatively low something common amongst previously intensively farmed arable lands. The change in management represents an opportunity to increase carbon stocks through a range of options.

The Wiltshire estate has an aged but fit for purpose set of grain and general storage buildings and a large concrete pad.



Example of Wild Farmed wheat grown with companion crops

The estate has a large area of woodland with mixed species, predominantly traditional deciduous types but with some conifer species. There is extensive Ash dieback which is prevalent in the area. The estate runs one biomass boiler with woodchip from the woodland, this is used to heat a small hamlet within the estate boundary.

The estate has created some interesting plantations, specifically for the cultivation of truffles. Recently planted with a great deal of effort and thought, these should see yields of truffles after 3-4 years.



Woodchip from the estate's woodland used in biomass heating



SFI bird seed mixes

Several lengths of new hedgerow have been planted since the baseline habitat survey was completed, this will add significantly to carbon removal, soil stability, food sources, habitat creation and nature connectivity over the coming years.



Some of many new hedgerows planted



New trees planed adjacent to exisiting woodland and a typical woodland glade

The sheep enterprise is a typical lowland commercial flock lambing predominantly Suffolk Mule Crosses with a lambing percentage in the region of 165%. This spring the Wiltshire estate had experienced issues with abortion which they were investigating at the time of the visit. The sheep enterprise is managed by a contact shepherd on a per head basis.



Last few sheep to lamb



One of circa 30 tree coups planted

The estate has planted a large number of tree coups across the land in Wiltshire over the last 12 months. These will create livestock shade and shelter, habitat for a range of species and will remove atmospheric carbon over time. These were not captured in the original baseline

On one part of the estate there is an established shoot that is operated by the previous owner. Associated with that are several game cover plots that were yet to be planted on the day of the visit.



Pristine chalk stream

The shoot manages a pond where ducks are placed for sport in the traditional season. Where the pond meets a chalk stream, there is sediment ingress into the stream.

This project is about far more than carbon removal, it will lead to habitat creation, connectivity and food provision that will help an enormous number of species. Human food production is important for Mawley Hall LLP and as such, an efficient, regenerative and profitable farming system is key to the success of the estate and its operations.

Shropshire Estate

Cattle and sheep production are the focus here with some arable land managed under a contract farming arrangement with a more regeneratively leaning operator than Wiltshire.

The sheep flock here are managed in hand and consist of a commercial flock and a flock of Shropshire sheep that graze in new orchard plantations due to their propensity to avoid damaging young trees.

Ravens have been a problem in Shropshire, at times killing young lambs, the estate take a range of measures to reduce this issue.



Winter wheat under stress

As with Wiltshire this estate is being restored to a high standard with a lot of newly planted trees, hedgerows and parkland restoration.

There is approximately 400ha of arable crops grown on medium to shallow soils, some light land has limited arable potential. On the day of the visit there were some crops under stress with a couple of wheat fields in particular showing signs of nutrient deficiency.

The soil organic carbon stocks are relatively low and represent an opportunity to increase under the resident management team.

The cattle consist of pedigree herds of Highland and Hereford cattle along with (at the time) housed Angus cross animals that were being fattened. There is an extensive and well-designed system of livestock housing and welfare facilities albeit access for large vehicles is challenging.

On the same site a new meat cutting facility has been built which incorporates very modern systems for handling a range of carcasses, including estate reared venison.

There is a formal deer park on the Mawley Estate and there are significant wild populations.



The river Rea runs through the farm and appears to be in good condition.





There is a quarry on site that is used to provide some stone used on the estate for track maintenance.

Mawley Hall Estate borders a block of woodland that remains under Forestry Commission management. The estate has an extensive woodland portfolio including broadleaved and conifer woodland with some chestnut coppicing opportunities. Woodchip and timber are sold from the estate.

Scope

The project covers some 3,689ha across the two locations. The activities include arable production, a combination of Sustainable Farming Incentive (SFI) and Higher Tier schemes, a significant commercial sheep enterprise, a relatively new suckler herd of Belted Galloway and more established Hereford and Highland Cattle herds. This project also includes a Golf course and club in Shropshire, a meat cutting plant, forestry operations and a range of currently small but growing enterprises such as honey, truffle and eggs.

The project team have conducted a UKCCC soil carbon baseline (albeit at the time of writing this report there are still a few fields to baseline) full habitat, tree and hedge survey and a

full emissions audit. The Mawley Hall LLP team have been helpful and able to provide all emissions data in detail and in good time.

The estate's main houses have been excluded from this project as they are not financed by Mawley Hall LLP.

Background

According to the Fourth Assessment Report from the Intergovernmental Panel on Climate Change (IPCC), agriculture, forestry and other land uses (AFOLU) account for approximately 30% of the total anthropogenic GHG emissions (IPCC: Agriculture in Climate change 2007). GHG emissions in the AFOLU sector are represented by the difference between carbon sequestered through photosynthetic (forests and grasslands) and non-photosynthetic processes (soils and water) (sinks), and carbon released into the atmosphere as a result of agricultural practices, deforestation, fires and forest degradation (sources).

The AFOLU sector in England is a key socio-economic contributor and critical for ensuring local food security, employment, vibrant rural communities. It accounts for roughly 10% of national emissions mostly driven by livestock (75%), with fertiliser use (18%) and fuel combustion (7%) making up the numbers. This makes innovations as practised on Mawley Hall LLP critically important. The lessons learned here should be scaled up and adopted more broadly and carbon finance is a key piece of the puzzle needed to fund the transition.

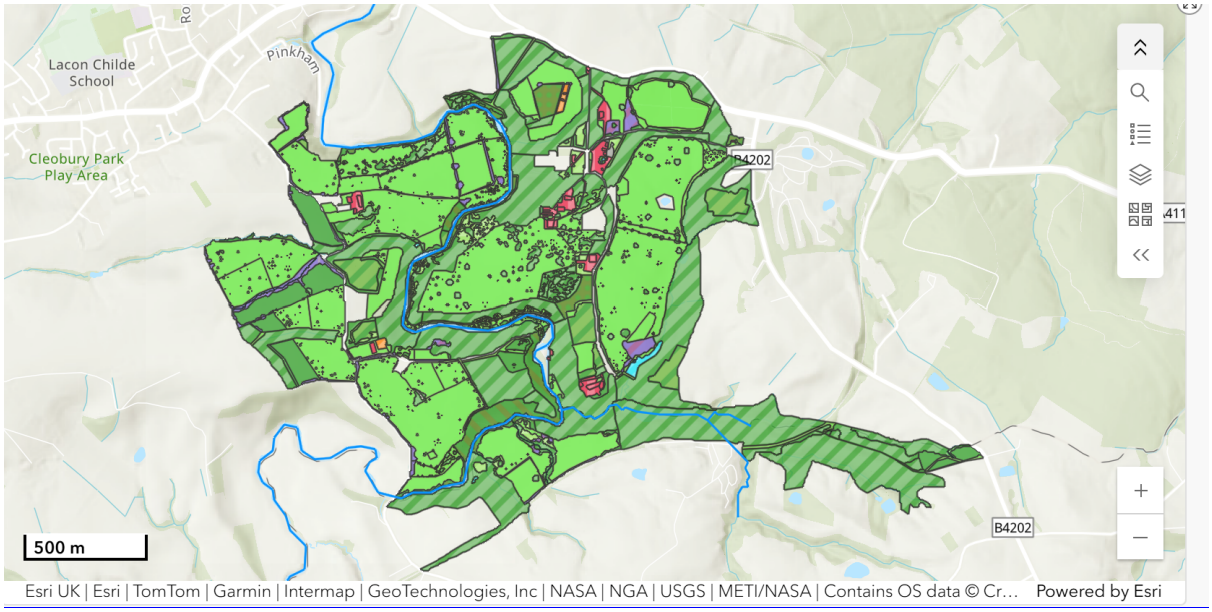
Project Boundary

Spatial boundaries

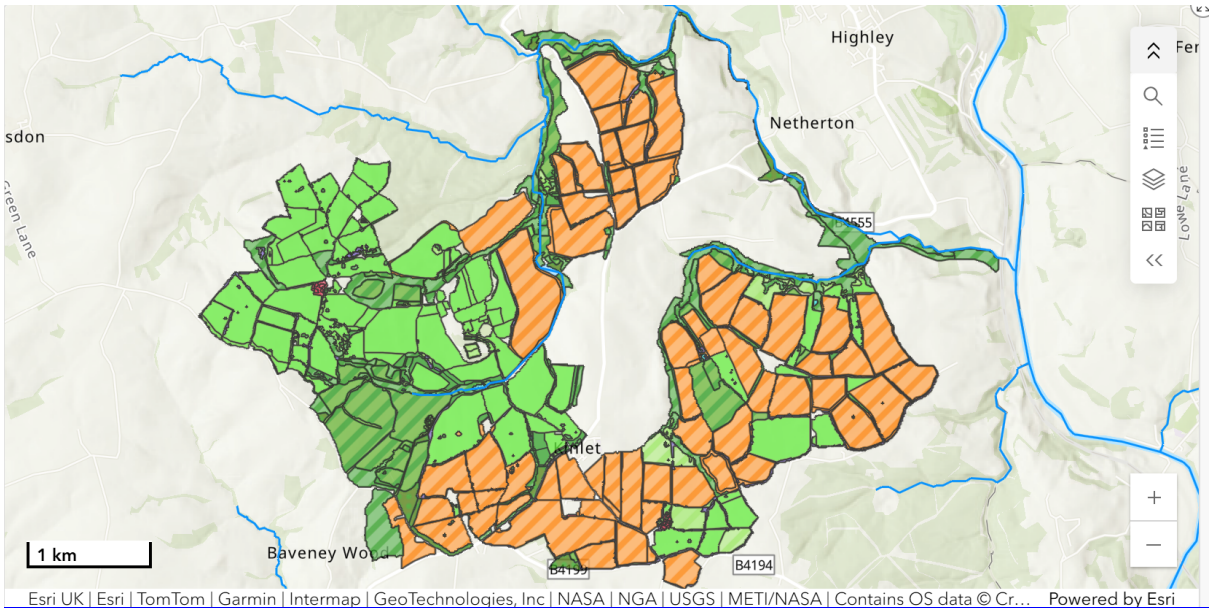
The whole project area of 3,689ha has been visited by the project developer.

A full habitat classification has been undertaken with the various land parcels mapped and available to view on the project dashboard. [Project Map | Mawley Hall]

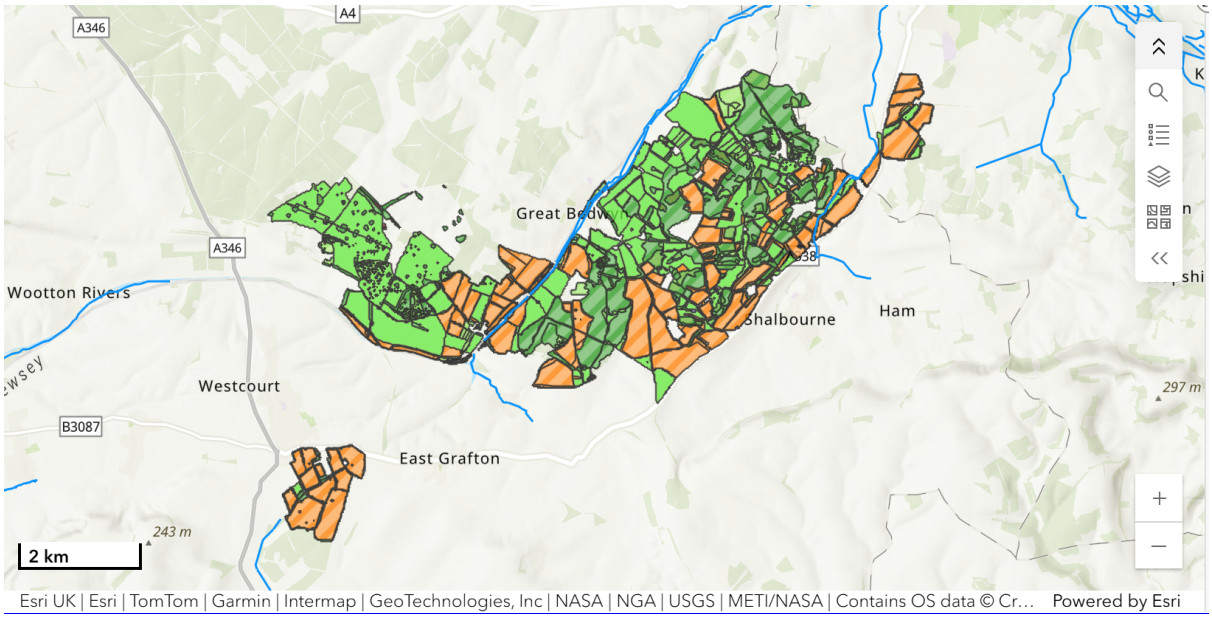
Figure 1: Mawley Hall LLP Project outlines



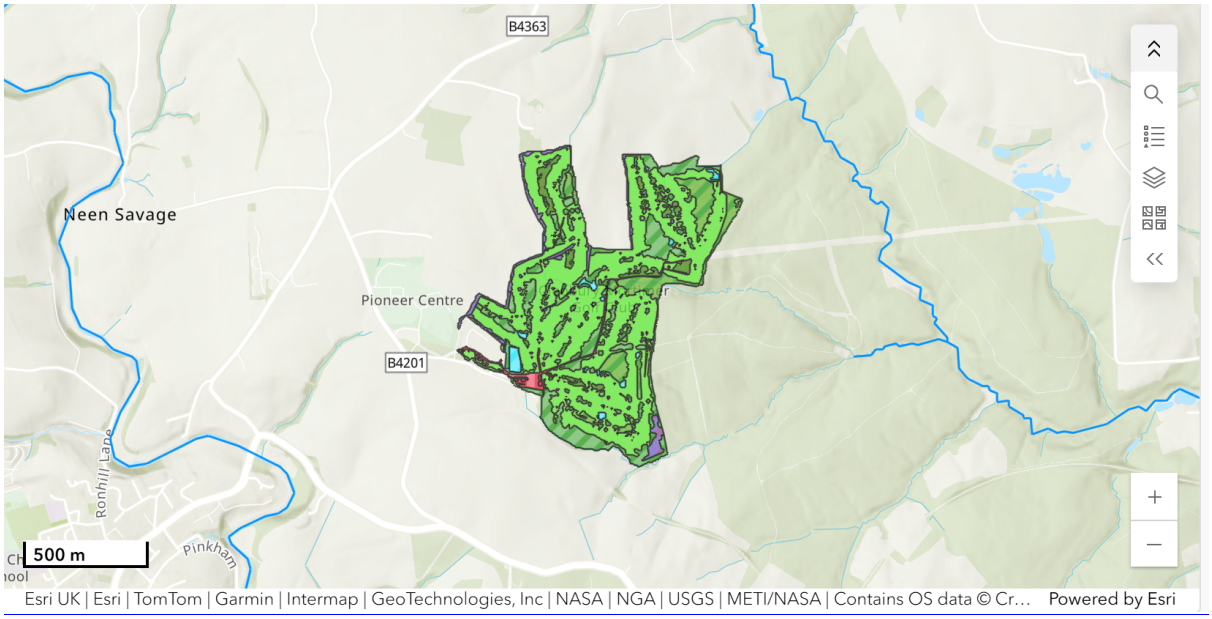
Mawley Hall Estate



Kinlet Estate



Tottenham and Stype Estates



Cloebury Mortimer Golf Club

This project report documents the project activities in 2025 and supersedes any documentation created before that time.

The next full audit will be carried out in mid-2030 and so the approval document covers the 5 years period between 2026 and 2032 with interim annual reports to be completed in the first half of each year.

Methodologies

The Mawley Hall LLP Project has undergone the UK Carbon Code of Conduct (UKCCC) project development and approval process to make its claims of emissions reductions and carbon dioxide removal and the ensuing net zero position. The process aligns with global carbon accounting standards.

The UKCCC Standard V4.0

The various innovations introduced and to follow at Mawley Hall LLP will lead to significant increases in soil carbon and carbon removal into new tree plantations and habitat creation. The farm aims to continue to reduce absolute emissions, the project therefore complies with the scope of the UKCCC V4.0 Standard and whole farm methodology.

The farm specific emissions calculation and removal data ensure that this project aligns with IPCC Tier 3 carbon accounting standards.

Internal Carbon Accounting

Internal carbon accounting refers to the practice of measuring and managing the carbon emissions of an organisation's operations and activities. It involves quantifying the amount of greenhouse gases, specifically carbon dioxide (CO2) and other carbon equivalents reported as CO2e emissions, that are produced because of the organisation's energy consumption, transportation, waste management, and other business processes.

Internal carbon accounting provides organisations with a comprehensive understanding of their carbon footprint and allows them to track and monitor their emissions over time. By collecting and analysing data on emissions, organizations can identify areas of high emissions and implement strategies to reduce their carbon footprint and develop a pathway to and beyond Net Zero.

The process of internal carbon accounting typically involves data collection, measurement, and calculation of emissions. This includes calculating energy consumption, fuel usage, greenhouse gas emissions from transportation, and other relevant factors. The data is converted into CO2 equivalent emissions, which allows for easier comparison and aggregation of different greenhouse gases.

Internal carbon accounting not only helps organisations meet their environmental sustainability goals but also enables them to identify cost-saving opportunities. By understanding their emissions profile, organizations can implement energy efficiency measures and adopt renewable energy sources, reducing their energy consumption and associated costs.

The UKCCC recommend that corporations use an internal CO2e value of £50 per tonne, although not yet a cash cost, this should help companies to formulate investment policies, always ensuring that the carbon cost of any decision is considered alongside any financial decision.

When analysing asset purchases, it will be the case that some assets will have a high carbon Return on Investment but low financial return and others the reverse. In line with the GHG Protocol Scope 3 Standard, companies should account for the entire emissions of a new asset within the year it is purchased.

Moreover, internal carbon accounting can support organisations in complying with regulatory requirements related to emissions reporting. It also contributes to building a positive brand image by demonstrating a commitment to sustainability and environmental responsibility.

A UKCCC certified Net Zero journey must be based on emissions reductions and internal carbon removals (insetting). The aim of this project is to achieve Net Zero status through internal management and process change.

The Net Zero pathway created aligns with international standards, in particular the SBTi and the GHG Protocol Land Sector and Removals Standard (LSRS) where farm level data has been gathered and assessed. There is a contradiction between the SBTi that does allow the use of removals from proximate land under the control of the project host and the GHG Protocol LSRS which does not. The UKCCC fully expect the GHG Protocol to align in the second iteration of the LSRS to allow the use of proximate land removals towards a Net Zero Pathway. This aligns with Paris Article 6, under the Nationally determined Contributions.

Under the GHG Protocol Net Zero standard all inventory emissions must be accounted for in the year of purchase. The project team have given two scenarios, one to align with the standard and another writing off inventory carbon over 10 years in alignment with financial accounting processes. It must be emphasized that Mawley Hall LLP can chose which method to report their emissions but must be clear on which option has been chosen.

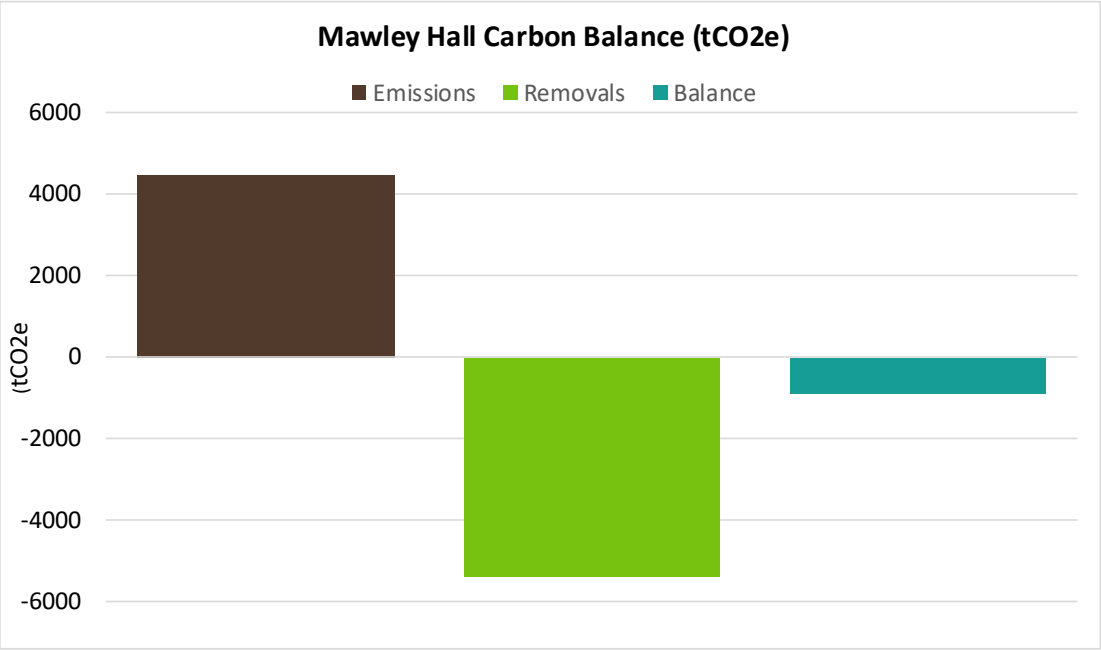
Once a project has achieved Net Zero on an ongoing basis, it can report zero Scope 3 emissions throughout its supply chains.

Carbon balance – Mawley Hall

This report uses 'depreciated over 10 years' methodology for the 'inventory' emissions.

In the year to 31 December 2025 Mawley Hall emitted 4,454.76 tCO2e and removed -5,371.62 tCO2e. This gave a net carbon balance of -916.86 tCO2e which equates to -0.29 tCO2e per hectare. See Figure 2.

Figure 2: Overall carbon balance



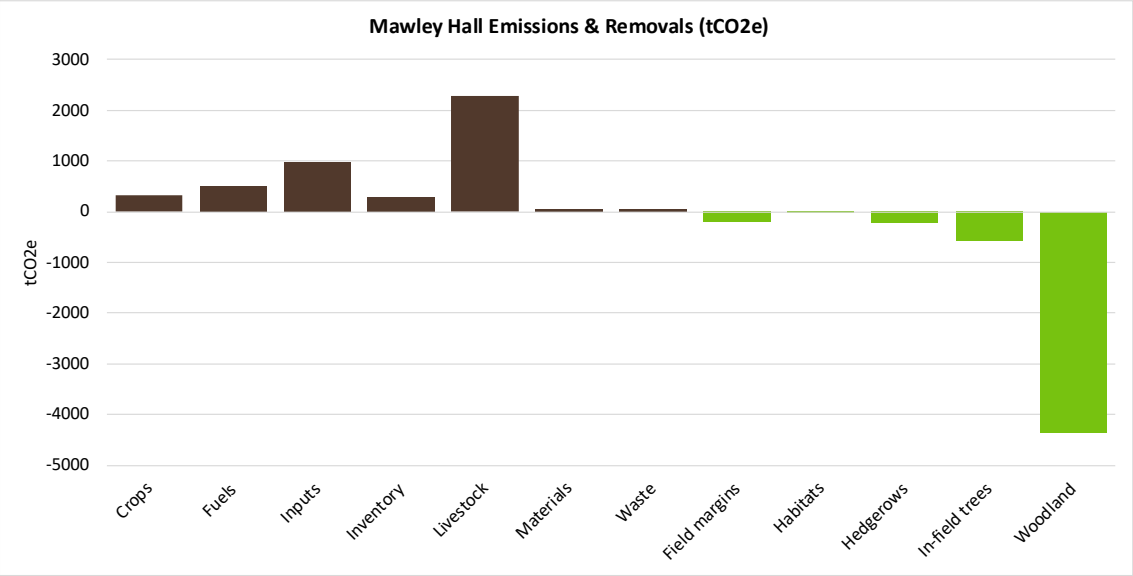
Emissions and removals by section

Figure 3 shows Mawley Hall's 2025 emissions and removals by section. See more detail in the key sections below.

The key emitters (totalling 85% of total emissions) are the livestock enterprises (52%), crop inputs (22%) and fuels which represented 11% of total emissions.

Figure 3 also shows current removals of the above ground habitats and biomass. It is worth noting that -4354.63 tCO2e was removed by the farm and estate's woodlands -566.55 tCO2e by the in-field trees. These two areas represent 92% of total removals.

Figure 3: Emissions and removals by section



Emissions – 2025 baseline (year to 31 December 2025)

Headline emissions by scope and greenhouse gas

Scope 3 emissions represent 31% of all emissions and methane contributes 37% by Greenhouse Gas (GHG) – see Figure 4.

Figure 4: Emissions by scope and greenhouse gas

Emissions (tCO2e)	Emissions by Scope				Emissions by GHGs				Total
	Scope 1	Scope 2	Scope 3	Outside of Scope	CO2	CH4	N2O	Only CO2e Available	
Crops	325.20	0.00	8.13	0.00	0.00	0.00	308.94	24.39	333.33
Fuels	298.34	35.65	86.63	88.06	329.80	0.46	3.30	175.11	508.67
Inputs	428.76	0.00	538.22	0.00	0.00	0.00	321.02	645.96	966.98
Inventory	0.00	0.00	272.40	0.00	18.19	0.00	0.00	254.21	272.40
Livestock	1902.40	0.00	374.98	0.00	0.00	1650.61	251.79	374.98	2277.38
Materials	0.00	0.00	40.22	0.00	0.00	0.00	0.00	40.22	40.22
Waste	0.00	0.00	55.78	0.00	0.00	0.00	0.00	55.78	55.78
Total	**2954.70**	**35.65**	**1376.36**	**88.06**	**347.99**	**1651.07**	**885.05**	**1570.65**	**4454.76**

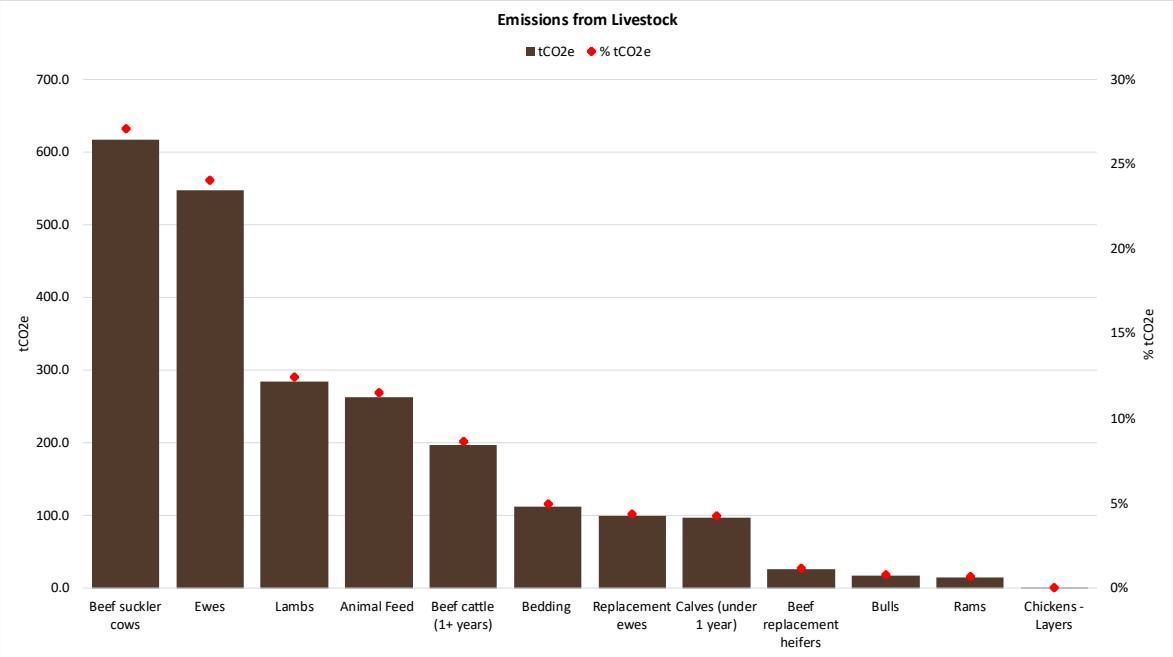
Emissions by section

As shown in Figures 5 and 6 the areas with most opportunity for potential emission reductions is crop inputs and fuel. In many ways these go hand in hand.

Livestock

Figure 5 shows that circa 84% of emissions were from the livestock. The sheep flock and cattle herd had very similar emissions, 946.77 tCO2e and 955.49 tCO2e respectively.

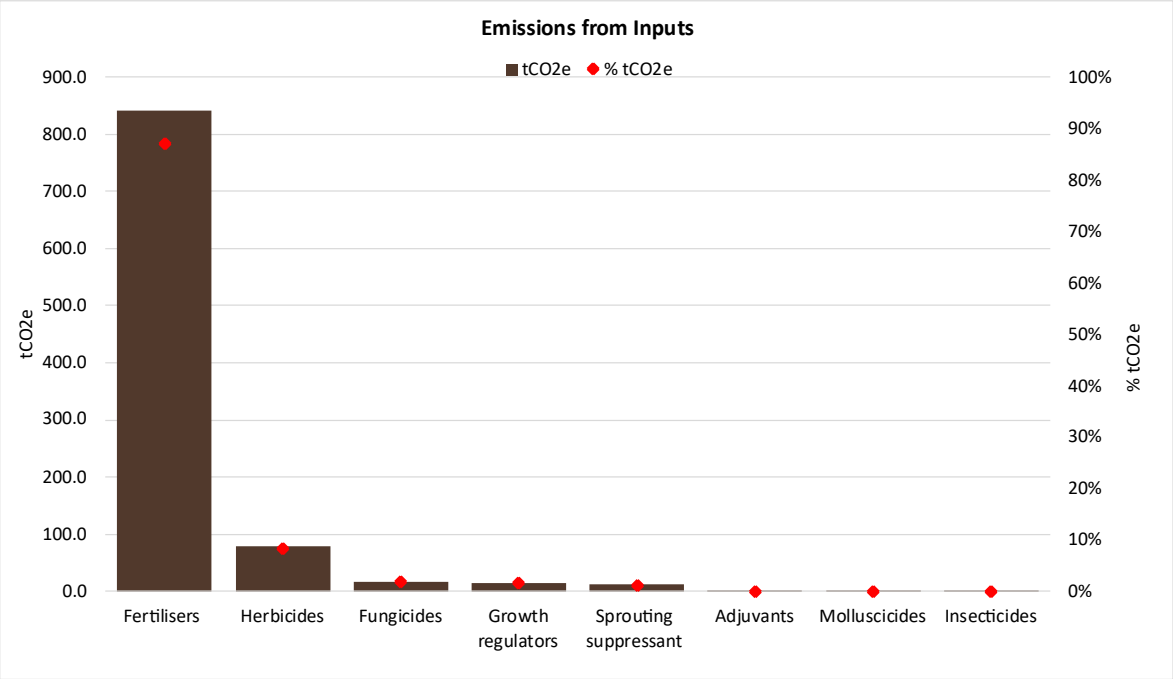
Figure 5: Emissions from livestock



Crop Inputs

Figure 6 shows that circa 87% of the crop input emissions are from fertiliser (841.44 tCO2e) with the remaining 13% from sprays. 8.2% (79.38 tCO2e) of all crop input emissions are from the herbicides.

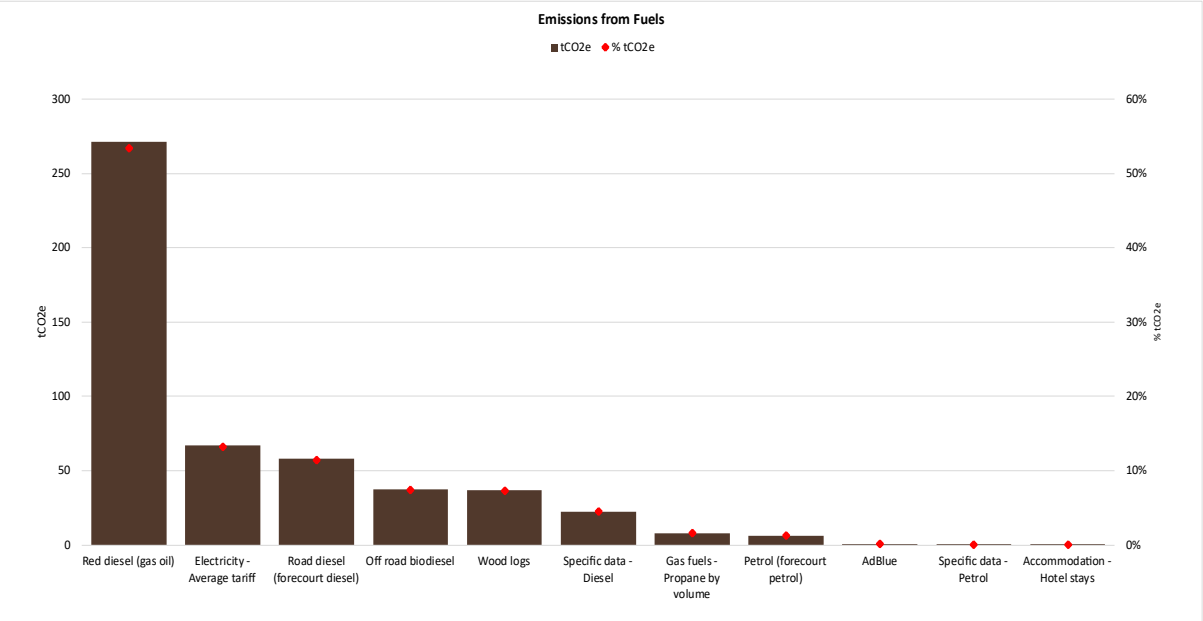
Figure 6: Emissions from inputs



Fuel

Figure 7 shows that over 50% of the fuel emissions are from red diesel (271.27 tCO2e) and a further 13% from average tariff electricity (67.21 tCO2e). Road diesel represents 11.4% of total fuel emissions.

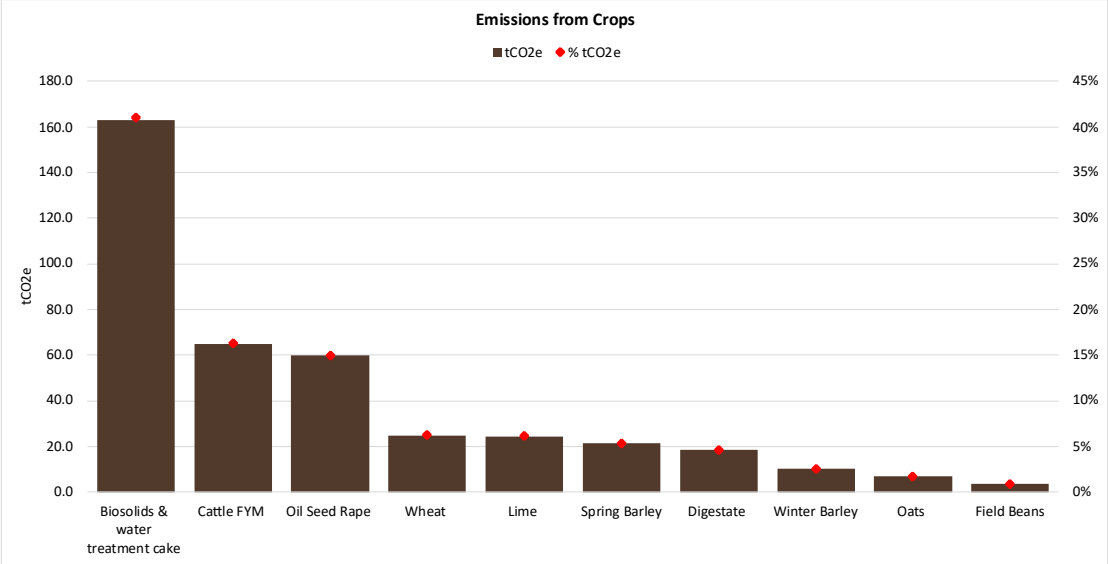
Figure 7: Emissions from fuel



Crops

Crops represented just 6.6% (333.33 tCO2e) of total emissions. Organic fertility sources (digestate and cattle FYM) represented almost 50% of crop emissions totalling 163.37 tCO2e. See Figure 8 for more detail across the arable crops.

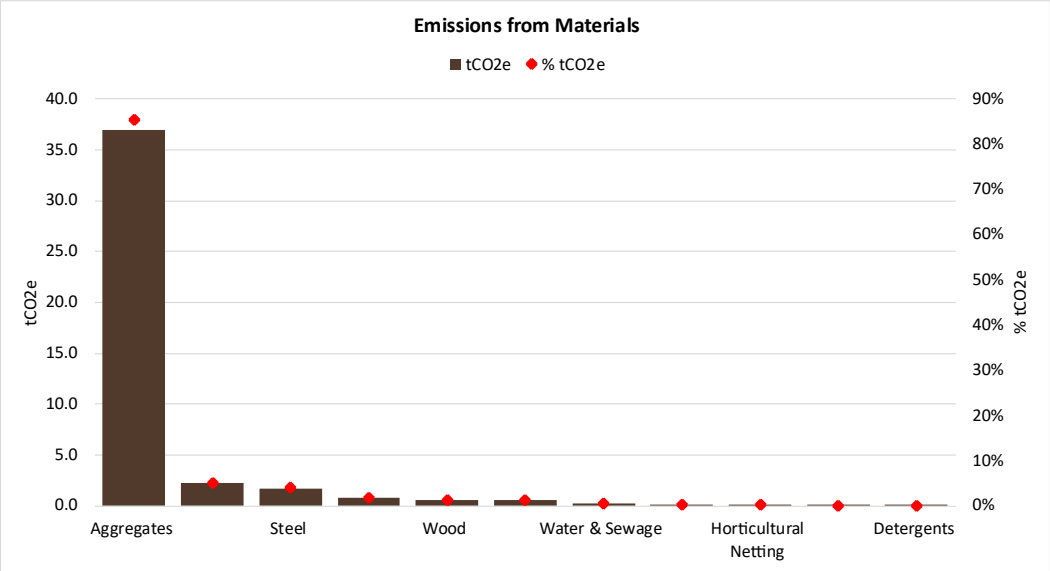
Figure 8: Emissions from crops



Materials

Emissions from materials/repairs equated to 43.30 tCO2e and represented less than 1% of total emissions. This area of emissions includes road and fencing materials used across the estate in 2025. It also includes any mains water used in addition to that extracted from bore holes.

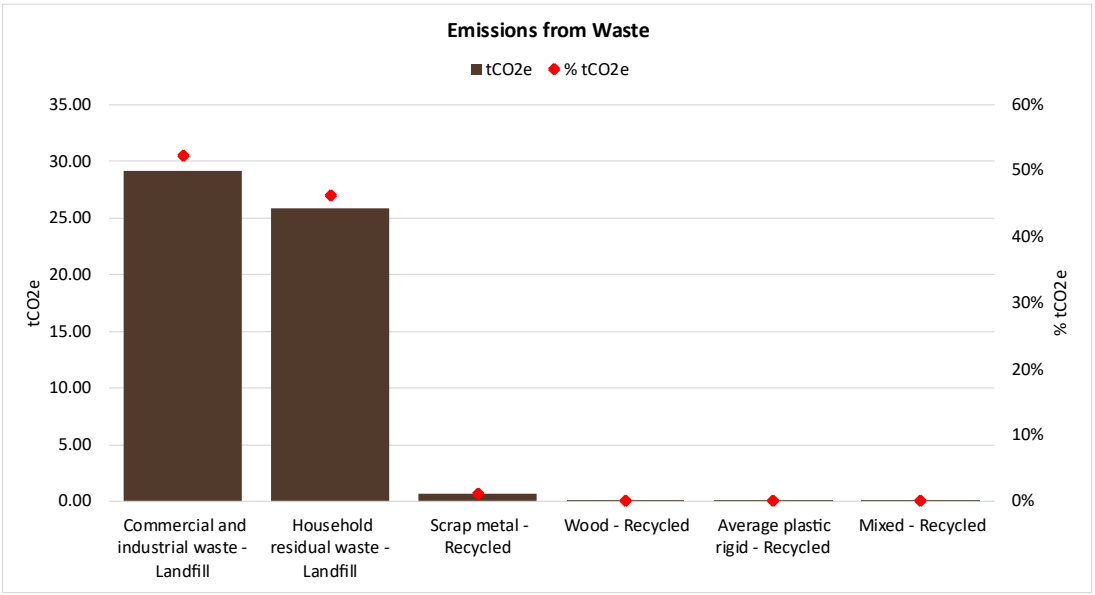
Figure 9: Emissions from materials



Waste

Emissions from waste can be significant but can be reduced by recycling. Figure 10 illustrates the difference in emissions from waste recycled rather sent to landfill. Total waste emissions were 55.8 tCO2e of which 98.6% was from landfill waste.

Figure 10: Emissions from waste



Inventory

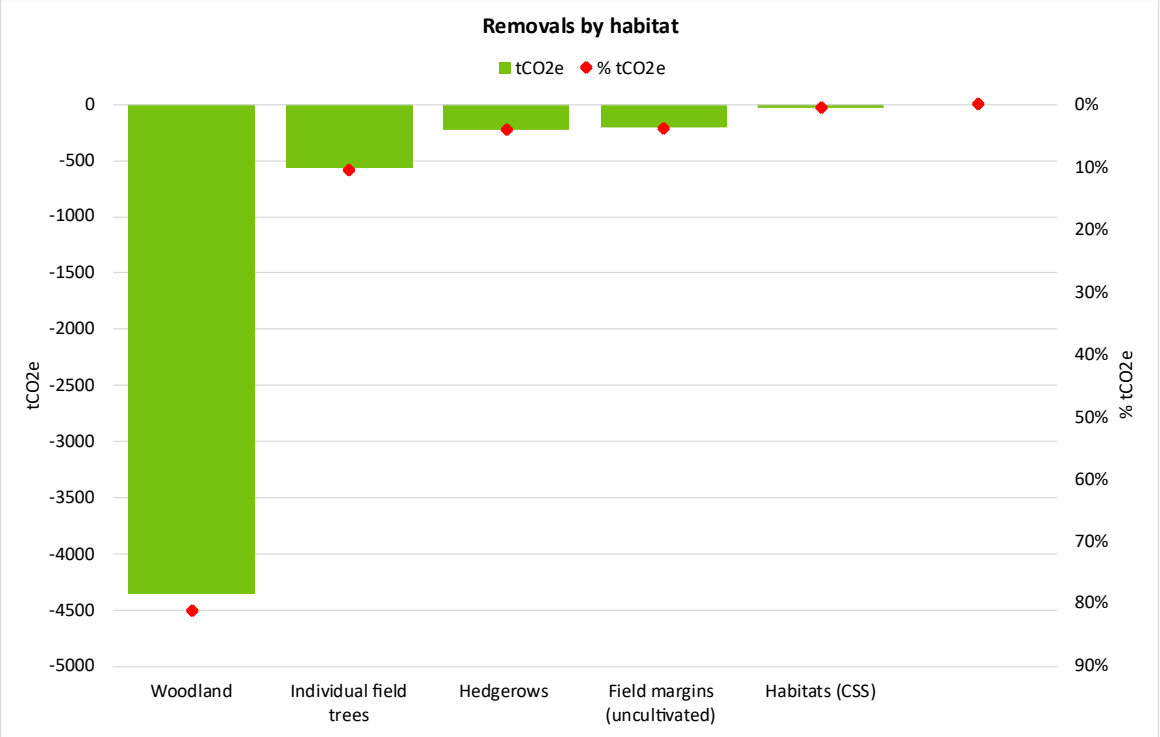
The inventory (capital items) emissions (depreciated over 10 years) which includes farm and estate machinery, vehicles, buildings, roads and fencing totalled 269.32 tCO2e (circa 5% of total Mawley emissions).

Removals – 2025 baseline (Year to 31 December 2025)

Understanding the opportunities to remove more carbon and increase biodiversity and habitat connectivity starts with a baseline habitat map to identify and quantify the areas and locations of habitat and land use. The detail and location of habitats is shown at [Habitats | Mawley Hall.]

As noted above -4354.63 tCO2e was removed by the farm and estates woodlands -566.55 tCO2e by the in-field trees. These two areas represent 92% of total removals. The hedgerows and field margins contribute -426.69 tCO2e (14.7%) of Mawley Hall removals.

Figure 11: Removals by habitat



The Mawley Hall LLP Management Team have already identified a range of interventions to meet the project aims.

Significant areas of tree planting, including normal woodland management and through the planting of individual parkland trees and round tree coups has taken place. Although young, they will continually contribute to carbon removal over the coming years.

Hedgerows are being planted at scale across the estates to improve habitat provision, connectivity, soil stabilisation and carbon removal.

Arable reversion and the use of SFI options, cover crops etc will help build soil carbon and increase overall soil health.

Under the current scenario the Beyond Zero Team have identified an overall balance (before soil carbon removals) of -916 tonnes of CO2e, meaning 916 tonnes of CO2e are being removed above the total emissions and placing Mawley Hall LLP in a comfortable Beyond Zero position.

A conservative estimate of carbon removal of 2 tonnes per hectare per year on the arable of 1799 and 1 tonne per hectare on the grass area of 837 hectares adds an additional 4435 tonnes of removal, giving a total potential annual issuance subject to UKCCC approval of 5352 tCO2e less an insurance buffer of 3% gives 5190 credits for the 2025 year.

With the current management this could be higher but it is hard to justify without additional monitoring taking place. Our recommendation would be to utilise a system such as Downforce which will give greater confidence in the actual removal in the interim years.

It must be noted that the additional removal from the recently planted coups and hedgerows, has not been counted and so these will add further removal at the next verification event in 2030.

Emissions reduction and carbon removal strategies

The following recommendations and suggestions are for discussion to agree the actions over the next five years. Beyond Zero journey with their clients to increase the amount of carbon stock and to continually reduce emissions. Below we present a series of options to be considered in summary. Further detail can be found in the Beyond Zero Regenerative Agriculture Toolkit, that is available to all Beyond Zero clients

Improving soil health can help Mawley Hall LLP to:

- increase soil carbon storage;
- increase photosynthesis and carbon flow into roots;

- improve water infiltration;
- improve water-holding capacity on sandy soils;
- reduce irrigation demand;
- increase cation exchange capacity and reduce nutrient leaching;
- improve nitrogen-use efficiency;
- reduce nitrous oxide risk from compacted or waterlogged soils;
- improve crop rooting;
- reduce drought stress;
- reduce erosion and wind blow;
- improve workability;
- reduce cultivation intensity over time;
- support beneficial fungi, bacteria, protozoa, nematodes and earthworms;
- improve resilience in potatoes, onions, vegetables and combinable crops.

The reason for improving soil health is therefore not simply to “store carbon”. Carbon is the organising currency, but the wider outcome is a more resilient, biologically active and profitable farming system.

Soil as the Farm’s Main Carbon Engine

Most of the carbon entering the farm system comes through photosynthesis. Plants capture carbon dioxide from the atmosphere and turn it into sugars, roots, leaves, stems, tubers, grain and residues. A proportion of this carbon is harvested and sold, but a proportion can be returned to the soil through:

- root exudates;
- dead roots;
- crop residues;
- cover crop biomass;
- dung and urine from grazing livestock (potentially);
- compost;
- biochar;
- ramial woodchip;
- hedge and tree litter;
- fungal biomass;
- microbial necromass;
- stable humus formation.

The objective should be to maximise the amount of carbon captured by plants and then retain as much of that carbon as possible within the farm system.

This means that the Mawley pathway should focus on four linked questions:

1. How do we grow more total biomass?
2. How do we keep living roots in the soil for longer?
3. How do we reduce unnecessary carbon losses from cultivation, erosion and bare soil?
4. How do we stabilise more carbon in soil, woody biomass and biochar?

The Five Soil Health Principles

The Beyond Zero regenerative agriculture toolkit is built around five practical soil health principles. These should guide the Mawley Hall LLP programme.

Keep soil covered

Bare soil is vulnerable soil. It loses carbon and the opportunity to add more, moisture, structure and nutrients. On lighter and sandier land, bare soil is also at greater risk of wind erosion, capping, slumping and temperature extremes.

Mawley Hall LLP should aim to keep soil covered through:

- cover crops;
- crop residues;
- living mulches where practical;
- winter cover;
- unplanted headland covers in potato crops;
- hedge and tree litter;
- composted materials;
- ramial woodchip.

The target is not permanent cover at any cost, but less bare soil for less time.

Keep living roots in the soil

Living roots feed soil biology. Root exudates provide sugars, amino acids and organic compounds that support bacteria, fungi, protozoa and other soil organisms.

More living roots mean:

- more carbon entering the soil;
- more microbial activity;
- better aggregation;
- improved nutrient cycling;
- better soil structure;
- greater resilience to drought and heavy rain.

This is why cover crops, herbal leys, willow, hedges, ditch-line trees, adaptive grazing and high-biomass crops are all central to the Mawley Hall LLP strategy.

Minimise unnecessary disturbance

Cultivation is necessary in high output systems. However, repeated disturbance can accelerate organic matter loss, break fungal networks, damage aggregates and expose soil carbon to oxidation.

Mawley Hall LLP should therefore pursue **least necessary disturbance**, not ideological no-till.

This means:

- cultivate only when there is a clear purpose;
- reduce the number of passes where possible;
- use low-disturbance subsoiling only when compaction is diagnosed or as the only cultivation pre planting;
- avoid working soil when too wet or too dry;
- follow structural repair with roots;
- reduce cultivation first on land pre wheat and maize
- trial reduced-disturbance approaches on all grades of land.

Increase plant diversity

Different plants feed different parts of the soil food web. Diverse rotations and cover crop mixes can support a wider range of root structures, exudates, fungi, bacteria and beneficial insects. Biology creeps into fields from field edges and from hedgerows.

Mawley Hall LLP can increase plant diversity through:

- multi-species cover crops;
- herbal leys;
- legume-rich forage mixtures;
- deep-rooting species;
- flowering margins;
- hedgerows;
- willow lines;
- cricket bat willows;
- energy crops;
- occasional high-biomass crops such as hemp or Jerusalem artichokes;
- more diverse break crops where markets allow.

3.5 Integrate livestock where appropriate

Livestock can accelerate nutrient cycling and return biomass to soil through dung, urine and trampling. They can also help manage high-biomass covers and forage crops.

Livestock should be used as a soil-building tool, not simply as an additional enterprise

Cattle and sheep enterprise

These enterprises create the greatest emissions yet offer one of the best opportunities to accelerate carbon removal into soils.

At present most livestock is set stocked on a combination of parkland and in-cover and forage crops in the arable rotation.

We have assumed that the parkland areas shall remain under the current management system, due to the estate wide ban on electric fencing and because the incentive is based on improving the estate aesthetic rather than maximising agricultural output. That said there is an opportunity to gradually increase sheep numbers under set stocking if that were desirable.

On the arable land it would be advantageous to consider adaptive grazing of both sheep and cattle. Again, this may not be desirable in Wiltshire as electric fencing cannot be used but increasing stock grazing intensity on high biomass cover and forage crops will lead to a greater degree of organic carbon stock increases.

Arable

As both geographic units are managed under CFA agreements there is less control over the day-to-day operations but influence should increase over time. Increasing soil organic carbon and thus organic matter is vital. Not only does it lead to greater number of carbon credits being issued but it also leads to healthier soils and plants. Eventually reduction in fertilisers and chemical usage is possible and soils become more drought tolerant. We are trying to build soils that are abundant with life, with healthy fungal, microbes and nematode communities that cycle nutrients and swap and share nutrients and carbon. In time this will deliver a significant ROI by reducing the cost of crop production.

Cultivation strategy is important as any level of soil inversion or aggressive cultivation leads to soil carbon losses. That said, one of the primary drivers of crop yields is the ability for air and roots to move freely through soil and thus compaction needs to be avoided and removed where it exists. Reducing tillage will increase carbon storage and deliver on the benefits mentioned above but tillage should not be stopped overnight. The use of low disturbance subsoilers and the likes of Aerworx roller aerators, coupled with direct drills such as the John Deere 750A provide both reduced noninversion/exposure tillage and

planting whilst removing any compacted areas. This will also dramatically reduce crop establishment costs over time.

High biomass cover and forage crops should be used wherever possible before spring crops, coupled with grazing. The more diversity in the mixes the better the result will be as different species have different bacterial and fungal relationships and help build those communities.

On the visit, in Wiltshire, hard soil conditions were observed, although conditions were dry, dry healthy soils should not be hard. The conditions indicated that the use of Gypsum may be beneficial. Gypsum helps clay soils create clusters of particles (flocculation) and create soil aggregation. This happens as the calcium in the gypsum displaces magnesium and sodium on a clay particle. The gypsum also supplies a useful amount of calcium and sulphur, with the former often in short supply even when neutral or alkaline conditions exist.

There is a 'muck for straw' deal in place in Wiltshire which presents an opportunity to create a composting operation. Cattle and sheep muck is useful, but is better when composted over time, especially with the addition of other products and in particular woody biomass.

The estate has significant woodland operations and although there are competing potential uses for woodchip, using some woodchip to compost with manure will improve its value to the farm.

The concrete pad that held woodchip at the time of the visit would make an ideal place for a composting operation.

Other alternatives to a full-on composting operation would be to build a few Johnson Sue bioreactors using materials from the estate. These can be used to good effect to help build fungal, bacterial and other soil life when combined with extensive cover crop use, livestock grazing and reduced tillage.

Additional habitat planting

The estate's team is well resourced in expertise to determine habitat planting regimes across the two sites and there is already in place a significant planting schedule. Our role is to challenge and suggest additional options to promote discussion about novel alternatives.

Cricket bat willows are in demand due to the rise of the sport across the globe. Willows will grow successfully in both very wet areas of fields and alongside water courses. They will cost £35-£40 to plant and in 12-15 years and after some simple management will create an income and unrivalled ROI of over £1,000 per tree, as well as removing additional carbon.

Some areas of arable land may suit the adoption of agroforestry, where trees and food crops are grown in the same field, often in organised rows to maximise light interception. Agroforestry systems are becoming an appealing way to grow timber, fruit, nut and other

species to unlock multiple new income streams. The tree rows provide shade and shelter for livestock and biodiversity as well as connectivity for various ground dwelling species. The trees also remove additional carbon from the atmosphere.

Another method is to grow willow coppice that is harvested, chipped and applied to land in a method called ramial woodchip production. This is a way to increase soil fertility over time and to increase soil carbon stocks.

Biochar

Biochar is an age-old technique that has gained interest in the last few years due to its ability to lock away carbon for centuries, improve soil fertility and water holding capacity and provide heat for other purposes.

Biochar is effectively the process of cooking biomass in the absence of oxygen. Wood once it gets to a critical temperature, emits gases that when ignited create heat to cook the biomass. The resultant biochar has an amazing lattice structure that significantly increases the porosity and capacity to retail moisture and nutrients. Once applied to land it can raise yields in drought conditions and help retain nutrients on lighter soils.

The estate has access to a large quantity of woody biomass and has the potential to grow much more. Biochar production has the potential to both raise yields on arable land and to increase the overall carbon removal. If biochar production can be coupled with a heat requirement, then the system can deliver a highly attractive ROI.

With the option to grade estate derived woodchip and divert best chip to biochar feedstock, undersize to ramial woodchip use and waste to compost, serious consideration should be given to developing a fully integrated system.

Solar

Although a large solar scheme is being planned for the main house in Wiltshire, very little has been invested in across the rest of the estate.

On the cattle building and butchery site in Shropshire there is an opportunity to instal a solar system to power the butchery and chiller space, to reduce cost and emissions.

Elsewhere on the estate there is an opportunity to install solar and battery systems to power tenanted properties in order that the estate becomes landlord and power supplier.

Potential of various interventions to increase carbon removal

Intervention	Typical Carbon Removal (tCO_2e/ha/year)	Longevity
Adaptive Grazing	1–6	Medium-long
Permanent Pasture Restoration	1–4	Long
Diverse Herbal Leys	1–5	Medium
Cover Crops	0.5–2	Medium
Agroforestry	5–15	Long
Hedgerows	2–8	Long
Woodland Creation	8–20	Long
Scrub Development	3–10	Long
Wildflower Meadows	1–4	Long
Wetland Creation	2–12	Long
Peatland Restoration	Avoids 5–40 emissions plus 1–10 sequestration	Very Long
Biochar Application	5–30+	Centuries
Enhanced Rock Weathering	2–20	Thousands of years
Short Rotation Coppice Willow	8–20	Long
Permanent Crops	2–10	Long
Johnson-Su Compost Systems	0.2–1	Medium
Worm Castings & Vermiculture	0.1–0.5	Medium
Fish Hydrolysate & Biological Inputs	Indirect	Medium
Hedgerow Trees	5–20	Long

The final stage is to present this report and discuss the data with the project team to ascertain the future management approach and monitoring processes required to ensure that the farm retains its Beyond Net Zero status to report zero Scope 3 emissions up the supply chain and to continue to issue and sell carbon credits.

Provisional Monitoring Plan

An Annual Monitoring plan has been created for the Mawley Hall LLP project, with full verification at the end of year 5 where all baselines will be retested and changes verified. This will form the baseline for the next verification cycle with the following items required for monitoring:

1. Any updates to soil organic carbon determined by laboratory soil analysis
2. Any significant changes in likely emissions data to include scope 1, 2 & 3.
3. Use of earth observation tech such as Downforce and documented records with landowners to establish the extent of land that would have been tilled.
4. Any changes to habitats through land use change or loss events
5. Any additions to land area

Notes:

- Any changes to activities are to be notified to the project development team.
- Any loss events due to fire or other circumstances out of the project hosts control must be notified to the project team.