



The Sirius Group

Cellarhead, Staffordshire

BIODIVERSITY IMPACT ASSESSMENT

January 2022

FPCR Environment and Design Ltd

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1.0 INTRODUCTION

- 1.1 FPCR were commissioned by The Sirius Group to undertake a Biodiversity Impact Assessment for the proposed development of a site approximately 4.97ha in extent in Cellarhead, Staffordshire (central grid reference: SJ 94779 49300). This report outlines the results of an Extended Phase 1 Habitat Survey, which was used to inform biodiversity offsetting calculations using the DEFRA Biodiversity Metric 3.0. In addition, the report outlines habitat enhancement, creation and management measures to be implemented both on and off-site to provide a measurable net gain to biodiversity. This report should be read in conjunction with the Ecological Appraisal (FPCR, December 2021) and Landscaping Mitigation Plan (FPCR, January 2022).
- 1.2 The aim of biodiversity offsetting is to compensate for adverse impacts on biodiversity identified after appropriate avoidance, minimisation and on-site restoration measures have been taken, according to the mitigation hierarchy as required by the NPPF.
- 1.3 The site is proposed as a battery storage site with associated infrastructure. The majority of the grassland will be lost to built development, while all existing hedgerows (aside from minor losses due to access requirements) and trees are to be retained. Approximately 0.8ha of the on-site grassland area is to be retained as it is located underneath electricity pylons. This will be enhanced to provide a biodiversity gain, while the majority of grassland loss will be compensated for by the creation of neutral grassland on off-site adjacent land. Woodland planting is proposed along the eastern boundary. All hedgerows will be enhanced by planting-up any gaps with native species and additional tree planting will be provided along the southern boundary to reduce visibility of the development.

2.0 METHODOLOGY

Field Survey – Baseline habitats

- 2.1 Baseline habitats were identified and mapped using the Phase 1 Habitat Survey¹ methodology which is used to determine broad habitat types in the wider countryside. The survey comprised a walkover of the site, mapping the broad habitat types and identifying a representative species list for each habitat, along with additional notes regarding the current 'condition'² of the habitat, completed in accordance with the Natural England's The Biodiversity Metric 3.0 Technical Supplement³. This was undertaken on 11th November 2021 by a suitably experienced ecologist.
- 2.2 Off-site (blue line) field compartments were subject to a further survey on 15th December 2021, following the above outlined methodology.

¹ JNCC. (1990). Handbook for Phase 1 habitat survey – a technique for environmental audit. Peterborough: JNCC

² 'Condition' is one of the measures of the quality of a habitat used within the DEFRA biodiversity metric. It takes into account key physical characteristics and typical species of a particular habitat type.

³ Natural England Joint Publication JP039 The Biodiversity Metric 3.0 auditing and accounting for biodiversity Technical Supplement. Access [online] 05.10.21. Available at: <http://publications.naturalengland.org.uk/publication/6049804846366720>

Biodiversity Net Gain Calculation

- 2.3 The development site was surveyed and mapped, as described above. Habitats were then converted to UK Habitat Classification system, with each habitat parcel described by its location, area, distinctiveness and condition. This information was then used to calculate the value of each habitat.
- 2.4 Full details of the calculation methodology are provided in Biodiversity Metric 3.0 – User Guide⁴.

Limitations

- 2.5 The habitat surveys were undertaken in November/December which is a sub-optimal time for habitat surveying as many plant species will not be present. Sufficient information was gathered to determine broad habitat types, however, species lists should not be regarded as exhaustive.
- 2.6 Given the simplicity and species-poor nature of habitats present on-site, it is not considered the outcome of UKHab classifications will have been affected by the timing of the survey, however, it should be noted that certain criterion of the condition assessments have had to include an element of professional judgement e.g. determining the health of trees when not in leaf, determining the cover of undesirable species when plants have died back etc.
- 2.7 The UKHab habitat map has been reproduced from detailed field notes and informed by aerial imagery, OS mapping and site maps provided by the client. The accuracy of this figure is therefore ultimately guided by the accuracy of these sources and can only be relied upon to a certain degree of resolution.
- 2.8 Natural ecological communities are susceptible to change; at times this change can be rapid as a result of internal and external environmental factors. The biodiversity offsetting calculations are based on ecological assessments of habitats carried out during 2021; as a result, changes which may affect the conclusions of this report may occur if a prolonged period of time elapses prior to the commencement of the project.

⁴ Stephen Panks, Nick White, Amanda Newsome, Jack Potter, Matt Heydon, Edward Mayhew, Maria Alvarez, Trudy Russell, Sarah J. Scott, Max Heaven, Sarah H. Scott, Jo Treweek, Bill Butcher and Dave Stone. 2021. Biodiversity metric 3.0: Auditing and accounting for biodiversity – User Guide. Natural England.

3.0 BASELINE CONDITIONS

Strategic Significance

- 3.1 The site is located in a predominantly agricultural landscape with limited semi-natural habitats in the surrounding area. The site is directly adjacent to an electricity sub-station and the nearest designated site is Wetley Moor SSSI, located 1400m from the site. The site is considered isolated from the SSSI and other areas of higher distinctiveness habitats given the proximity and lack of good quality connective habitat.
- 3.2 The site does not sit within or adjacent to any identified Local Nature Recovery Strategy, or similar, within the Staffordshire Moorlands district. With the dominance of low value, agricultural environs in the wider landscape, it is considered that the site is of **low strategic significance**.

On-site Habitats

- 3.3 The baseline pre-development habitats are shown in Figure 1, with a description and condition assessment provided below.

Modified Grassland



Photo 1: On -site modified grassland

- 3.4 The core of the site was formed by two modified grassland fields, grazed by sheep at the time of survey, but with evidence of cattle grazing also. The sward was dominated by perennial rye-grass *Lolium perenne*, with very limited herb diversity. Species included dandelion *Taraxacum officinale* agg., white clover *Trifolium repens* and creeping buttercup *Ranunculus repens* and were all recorded at low abundances. Undesirable species were occasional within the sward including creeping thistle *Cirsium arvense*, common nettle *Urtica dioica* and broad-leaved dock *Rumex obtusifolius*, however, these didn't make up more than 5% of ground cover.
- 3.5 The on-site modified grassland was considered to be of **moderate condition** when assessed using the Metric 3.0 condition criteria. The sward was short and homogenous with low species diversity however, lacked extensive damage, bare ground, scrub or bracken. The full assessment is shown in Table 1.

Table 1: On-site Modified Grassland Condition Assessment

Condition Criteria	Score
1 There must be 6-8 species per m ² . This criterion is non-negotiable for achieving good condition.	Fail
2 Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Fail
3 Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of the total grassland area.	Pass
4 Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or other damaging management activities.	Pass
3 Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Pass
4 Cover of bracken less than 20%.	Pass
5 There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981 (as amended)) and undesirable species make up less than 5% of ground cover.	Pass
Total passed criteria	5
Condition	Moderate

Hedgerows/Line of Trees



Photo 2: H7 showing typical structure

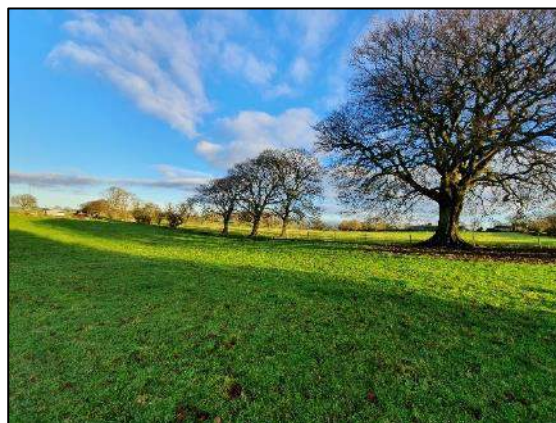


Photo 3: H5 line of trees with scattered hawthorn

3.6

Seven hedgerows were present within the site, dividing and forming the boundaries of the field compartments. Hedgerows were typically dominated by hawthorn *Crataegus monogyna* with other species present including elder *Sambucus nigra*, bramble *Rubus fruticosus* agg. and holly *Ilex aquifolium*. Five of the hedgerows were defunct and very gappy, however, the majority were managed, offering a short and dense structure. H5 along the eastern boundary of the site was beyond the fence line just off-site. Very little of the hedgerow remained, but a number of standard trees formed the boundary. H6 along the far southern boundary where access is proposed, comprised a line of trees with scrubby gorse *Ulex europaeus* on top of a hedge bank.

- 3.7 All hedgerows were considered to be habitats of principal importance as they comprised >80% native woody species and therefore receive consideration under the planning system through the Natural Environment and Rural Communities Act (NERC) 2006.
- 3.8 All hedgerows were classified as being in **moderate condition**, as outlined in the table below. Hedgerows scored well on structure, however, generally lost points due to percentage of gaps and dominance of agriculturally improved grassland at the base.

Table 2: Hedgerow Condition Assessment

Condition Criteria	H1	H2	H3	H4	H5	H6	H7
A1 Height >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass	Pass
A2 Width >1.5m average along length	Pass	Pass	Pass	Pass	Pass	Pass	Pass
B1 Gap between ground and base of canopy <0.5 m for >90% of length (unless 'line of trees')	Pass	Pass	Pass	Pass	Pass	Pass	Pass
B2 Gaps make up <10% of total length and no canopy gaps >5 m	Fail	Fail	Fail	Pass	Fail	Fail	Pass
C1 >1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length measured from outer edge of hedgerow, and is present on one side of the hedge (at least)	Fail	Pass	Pass	Fail	Fail	Fail	Fail
C2 Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground	Fail	Fail	Fail	Fail	Fail	Fail	Fail
D1 >90% of the hedgerow and undisturbed ground is free of invasive non-native and neophyte species	Pass	Pass	Pass	Pass	Pass	Pass	Pass
D2 >90% of the hedgerow or undisturbed ground is free of damage caused by human activities	Fail	Fail	Fail	Fail	Pass	Pass	Fail
E1 At least one mature tree per 30m stretch of hedgerow	Fail	Fail	N/A	Fail	Pass	Pass	Fail
E2 At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests, or diseases, or human activity	Pass	Pass	N/A	Pass	Pass	Pass	Pass
Total Fails	5	4	3	4	3	3	4
Condition	Mod	Mod	Mod	Mod	Mod	Mod	Mod

Off-site Habitats

- 3.9 Given the percentage of built development on the site, adjacent off-site areas have been included in the assessment in order to provide sufficient compensation.

Modified Grassland

- 3.10 Off-site field compartments comprised modified grassland, dominated by perennial rye-grass and with very few herb species limited to common mouse-ear *Cerastium fontanum*, broad-leaved dock and creeping buttercup. The grassland was classified as being in **moderate condition**, owing to its lack of structural and species diversity, as outlined in Table 3.



Photo 4: Off-site modified grassland

Table 3: Off-site Modified Grassland Condition Assessment

Condition Criteria	Score
1 There must be 6-8 species per m ² . This criterion is non-negotiable for achieving good condition.	Fail
2 Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	Fail
3 Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of the total grassland area.	Pass
4 Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or other damaging management activities.	Pass
3 Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.	Pass
4 Cover of bracken less than 20%.	Pass
5 There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species make up less than 5% of ground cover.	Pass
Total passed criteria	5
Condition	Moderate

4.0 PROPOSED HABITATS

Habitat Loss

- 4.1 The built development is proposed for approximately 3.2ha of the modified grassland. This is a low distinctiveness habitat that will be permanently lost. Two very small sections of hedgerow will be permanently lost.
- 4.2 All other habitats shown as lost will subsequently be re-created to a higher distinctiveness habitat e.g. modified grassland will be lost and recreated with other neutral grassland.

Habitat Creation

- 4.3 The proposed habitats are shown in Figure 2. On-site green infrastructure proposals include the creation of neutral grassland under electricity pylons along with tree planting along the eastern boundary of the site. Off-site areas are proposed for the creation of neutral grassland.
- 4.4 Small areas of on-site grassland will be retained without any habitat creation. This has not been shown for enhancement within the calculations, however, there may be some enhancement delivered through a reduction of management intensity.
- 4.5 The below table sets out the details of the proposed habitats within the development, together with their target conditions and how those could be achieved through the implementation of a detailed biodiversity management plan.

Table 4: Proposed Habitat Creation and Outline Management (Figure 2)

UKHab Type	Area (Ha)	Target Condition	Outline Habitat Creation and Management Prescriptions
On-site Habitat Creation			
Other Woodland; Broadleaved trees	0.3Ha	Moderate	Tree planting along the eastern edge will consist of a diverse mix of native species, appropriate to the local area. Planting patterns will be random or S rows to create a scalloped edge.
Other Neutral Grassland (Wildflower grassland)	0.8Ha	Moderate	Creation of a herb rich neutral grassland community, through chain and harrow soil preparation and seeding with an appropriate species rich seed mix ⁵ or local provenance, species-rich green hay. Moderate condition achieved through management involving 1-2 cuts per year, with the grassland left un-mown during the summer and any arisings removed.
Infiltration basin		Moderate	An infiltration basin will be provided within the area of neutral grassland to retain surface water run-off. This will be sown with an appropriate grass seed mix tolerant of wet conditions ⁶ .

⁵ Emorsgate EM2 Standard General Purpose Meadow seed mix or similar is recommended. <https://wildseed.co.uk/mixtures/view/3>

⁶ Emorsgate EM8 Meadow Grass Mixture for Wet Soils seed mix or similar is recommended. <https://wildseed.co.uk/mixtures/view/41>

UKHab Type	Area (Ha)	Target Condition	Outline Habitat Creation and Management Prescriptions
Swale		Moderate	Swales will be designed along either side of the access track to ensure appropriate drainage and filter pollutants from the access road. This will be sown with an appropriate grass seed mix tolerant of wet conditions (footnote 6).

Off-site Habitat Creation			
Other Neutral Grassland (Wildflower grassland)	3.91Ha	Fairly good	Creation of a herb rich neutral grassland community. Nutrients will be reduced through topsoil stripping or soil inversion. Seeding with an appropriate species rich seed mix (footnote 5) or local provenance, species-rich green hay. If monitoring shows that vigorous grass growth is limiting diversity, the introduction of additional yellow rattle <i>Rhinanthus minor</i> seed will be undertaken to limit grass growth. Fairly good condition achieved through management involving 1-2 cuts per year or a single late-summer hay cut and aftermath grazing.
Other Woodland; Broadleaved trees		Moderate	Tree planting along the northern edge of the off-site field will consist of a diverse mix of native species, appropriate to the local area. Planting patterns will be random or S rows to create a scalloped edge.

5.0 PROPOSED LINEAR FEATURES

Retained/Enhanced

- 5.1 Habitat retention is illustrated in Figure 3.
- 5.2 The proposals include the retention of the boundary hedgerows and line of trees. The retained hedgerows will be enhanced through a commitment towards their long-term management with the aim of maximising their biodiversity value. The following measures will be employed within the Site Boundary to enhance the existing hedgerows:
- gaps in hedgerows will be planted-up with a range of native species to increase connectivity and overall species diversity;
 - hedgerows will be subjected to reduced management to encourage the establishment of tall, bushy hedgerows;
 - fertiliser use will be prohibited within grasslands adjacent to hedgerows to prevent nutrient enrichment as a result of the Site management operations; and
 - a minimum of 1m adjacent the hedgerows will be managed as 'undisturbed' ground, where possible, within the Site boundary. Management of grasslands within these areas adjacent to hedgerows will be in line with the management of meadow grasslands.

Hedgerow Creation

- 5.3 Proposals include the creation of short sections of hedgerows around the boundary of the site. An additional hedgerow with trees will be planted along the eastern edge of the eastern-most off-site field in order to create a boundary between the created neutral grassland and existing habitat which is likely be maintained as pastureland.
- 5.4 Native species hedgerows will be planted to ensure they provide a diverse range of species along their length. In total, an additional 308m of native species hedgerows will be planted, with the following appropriate management in order to achieve good condition:
- failed specimens will be replaced during establishment on a like-for-like basis;
 - hedgerows will be managed to encourage tall, wide and bushy features with only one side of hedgerows cut each year;
 - fertiliser use will be prohibited within grasslands in the site boundary that are adjacent to hedgerows to reduce nutrient enrichment; and
 - a minimum of 1m adjacent to the hedgerows will be managed as 'undisturbed' ground where possible. Management of grasslands within these areas adjacent to hedgerows will be in line with the management of meadow grasslands.
- 5.5 Table 5 below sets out the details of the proposed linear habitats within the development.

Table 5: Hedgerow Retention and Enhancement

UKHab Type	Length	Target Condition
On-site Enhanced Hedgerows		
Hedgerow with trees	813m	Good

UKHab Type	Length	Target Condition
On-site Created Hedgerows		
Hedgerow with trees	146m	Good
Off-site Created Hedgerows		
Hedgerow with trees	162m	Good

6.0 BIODIVERSITY NET GAIN CALCULATION

- 6.1 At present, the on-site baseline consists of 19.97 habitat units and 7.58 hedgerow units. On-site post intervention consists of 9.35 habitat units and 11.98 hedgerow units. The off-site area baseline consists of 15.38 units and post habitat creation delivers 29.97 units. This represents a total of 19.85% gain in habitat units and 58.13% gain in hedgerow units. The full BIA calculator is attached.

Habitat Trading

- 6.2 The majority of habitat to be lost to the development is modified grassland, which is a low distinctiveness habitat. The proposals provide sufficient amounts of habitat creation to offset impacts to low distinctiveness habitats through habitat enhancement/creation measures outlined above. Medium distinctiveness habitat losses include the two small sections of hedgerows, however, are compensated for with the creation of on and off-site hedgerows to ensure that there will be no overall losses of medium distinctiveness habitats. The mature trees within the boundaries are considered to be of high distinctiveness, however, there will be no loss of these habitats.

7.0 CONCLUSION

- 7.1 Baseline habitats were identified, mapped using the UKHab Classification system following surveys at the site and surrounding areas in November and December 2021 (Figure 1). A Biodiversity Net Gain assessment was then completed for the site and adjacent off-site areas using the DEFRA Biodiversity Metric 3.0. Post-development habitats were determined from the landscape plan and are provided in Figure 2.
- 7.2 The results of the assessment demonstrate that, subject to the implementation of a detailed Biodiversity Management Plan secured by condition, the proposed development will deliver a measurable net gain to biodiversity, in accordance with the NPPF. The management plan should include details of habitat creation as outlined in Sections 4 and 5.



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Key

On site

Off site

Area Habitats

Developed land; sealed surface

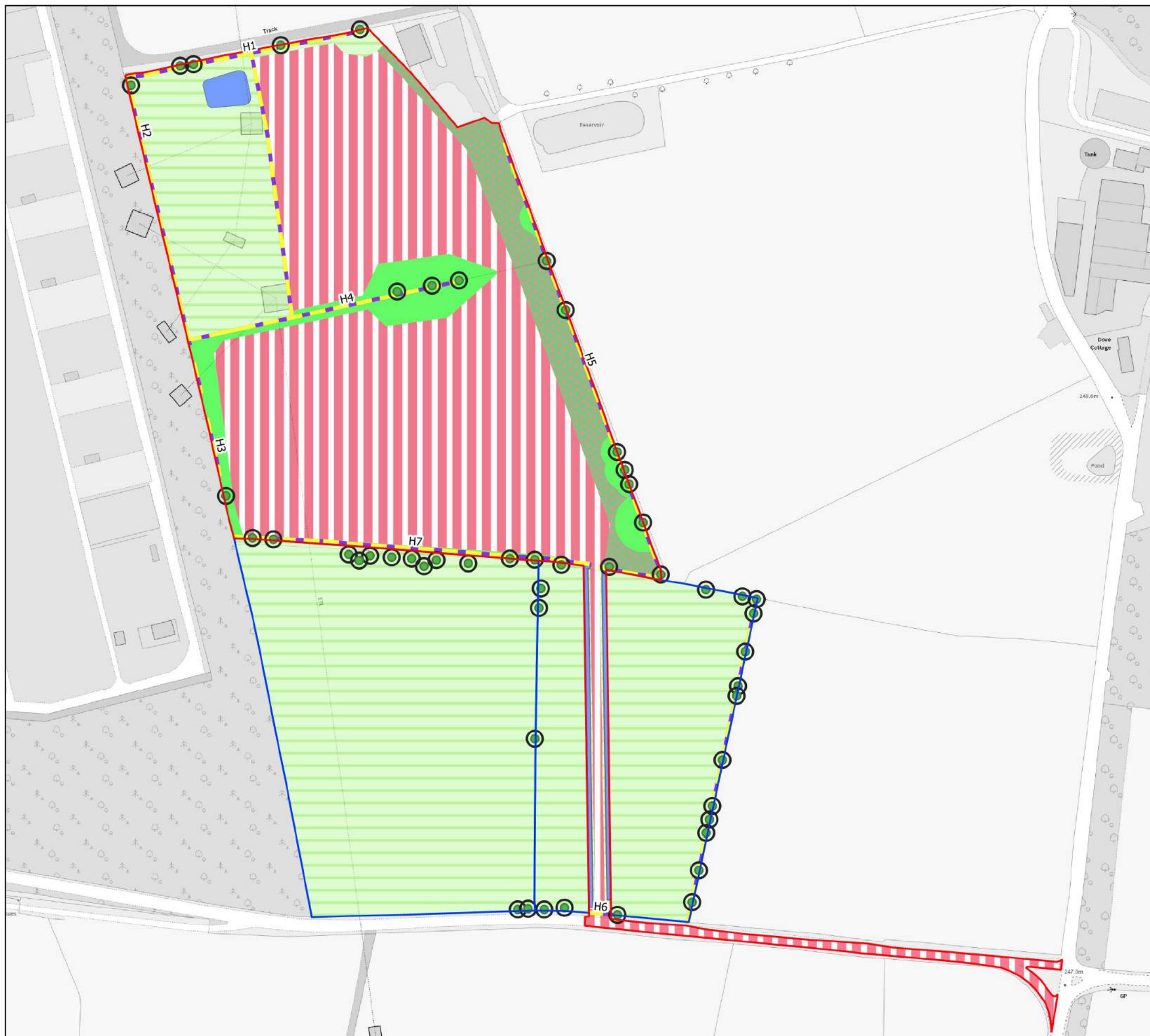
Modified grassland

Hedgerows

Native Hedgerow with trees (h2NE4)

Trees

Large



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Key

On site

Off site

Area Habitats

Swale / Infiltration Basin

Developed land; sealed surface

Modified grassland

Other neutral grassland

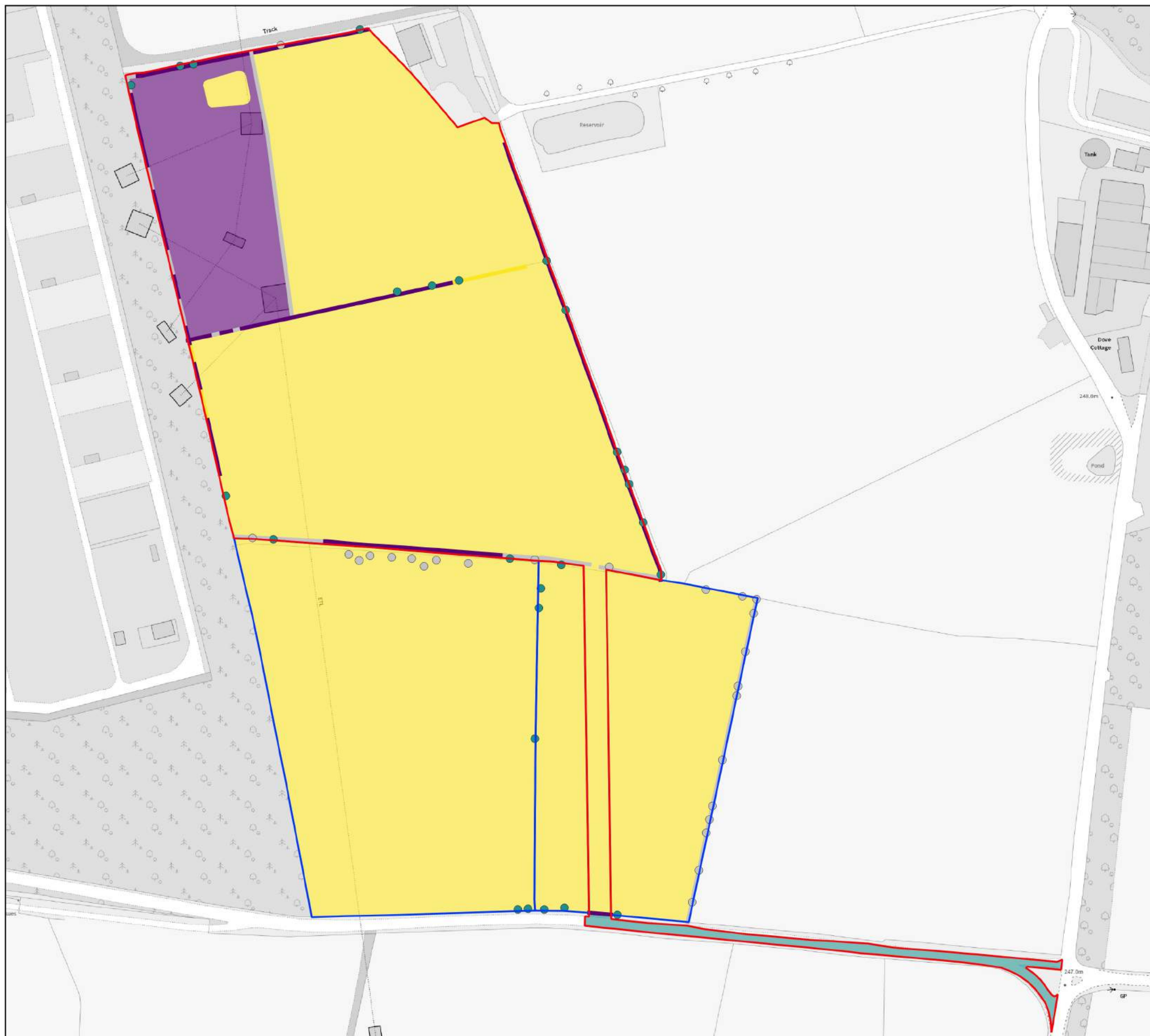
Other woodland; broadleaved

Hedgerows

Native Hedgerow with trees (h2NE4)

Trees

Large



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Key

On site

Off site

Area Habitats

Enhanced

Retained

Lost

Hedgerows

Created

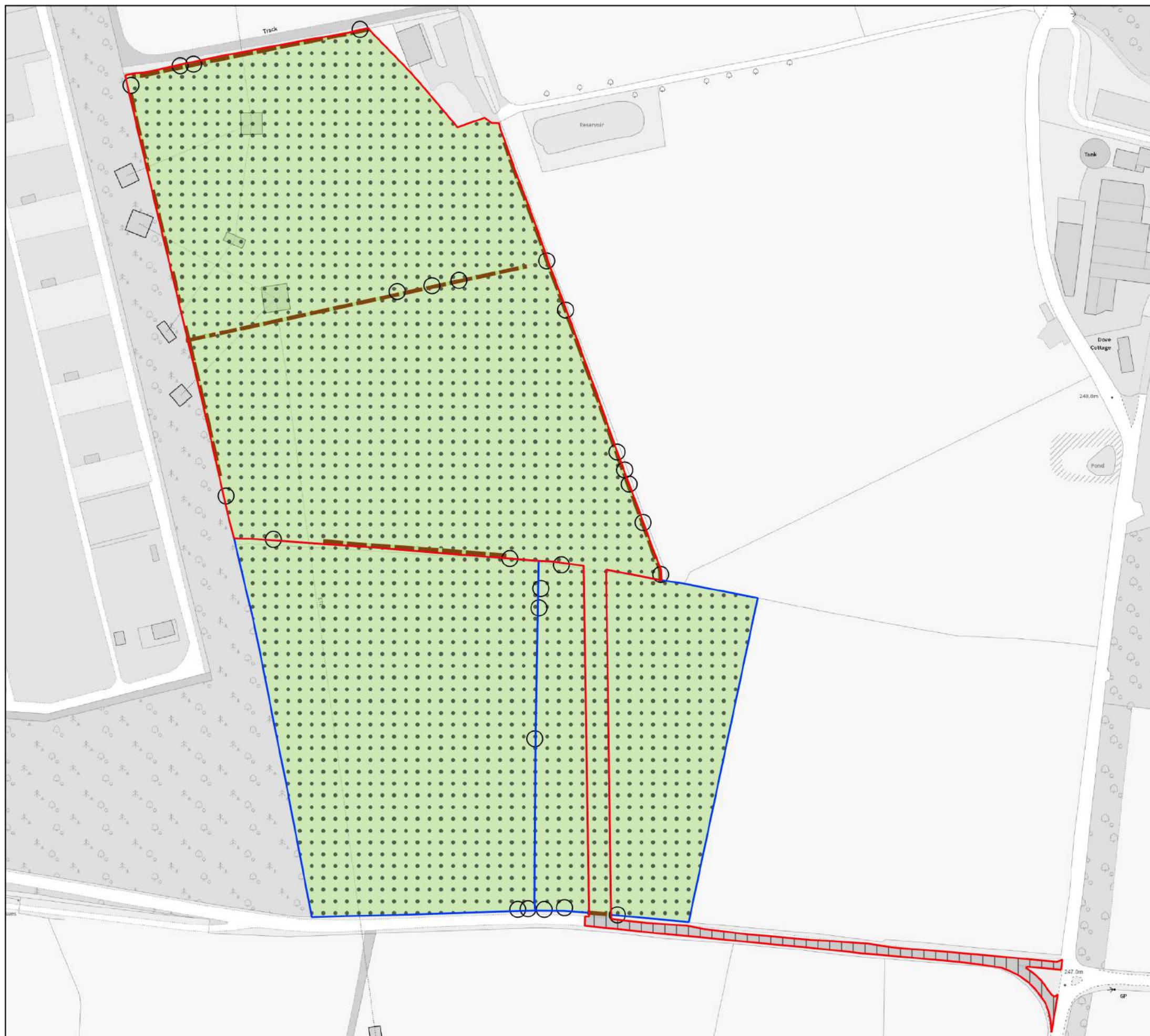
Enhanced

Lost

Trees

● Created

● Retained



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Key

On site

Off site

Area Habitat Condition

Moderate

N/A - Other

Area Habitat Distinctiveness

Low

V.Low

Hedgerow Condition

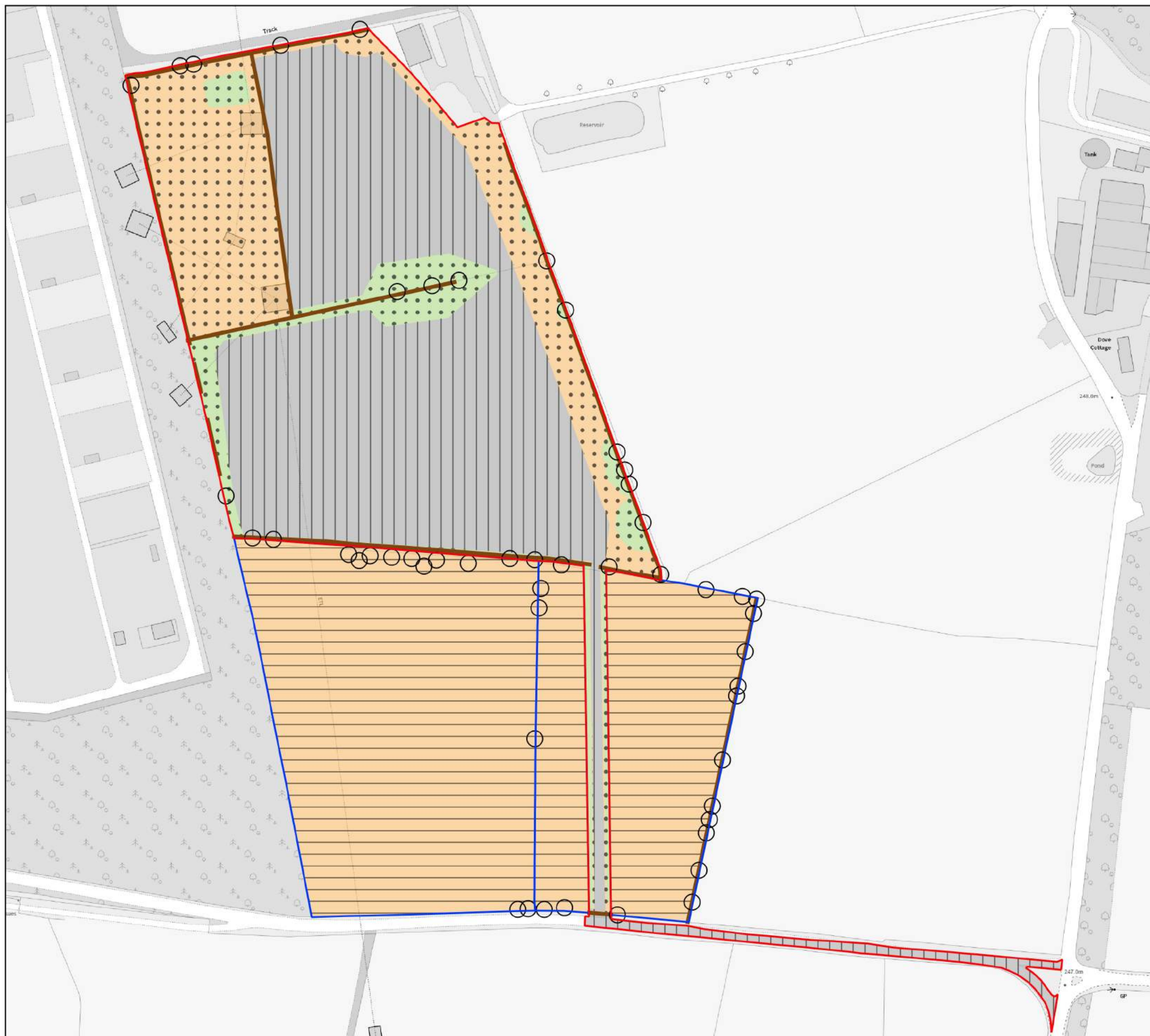
Moderate

Hedgerow Distinctiveness

Low

Tree Condition

Moderate



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Key

On site

Off site

Area Habitats Condition

Fairly Good

Moderate

N/A - Other

Area Habitats Distinctiveness

Medium

Low

V.Low

Hedgerow Condition

Good

Hedgerow Distinctiveness

Low

Tree Condition

Moderate