PRE-APPLICATION BRIEF BIODIVERSITY CALCULATIONS

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HODDER BRIDGE

CONTEXT

Ecological services and biodiversity management techniques are becoming an ever-increasing requirement for all aspects of planning, design and landscape management strategies. Following the successful implementation of the 'No net loss' principle by the majority of sites moving forward, it was recently detailed in the Government's 25 year plan for the environment that proposed development sites will be required to show that the existing biodiversity is not being adversely affected and that it improvement works are taking place, although when this is to be implemented is not specified. The recent State of Nature report (2019) has identified that a large proportion of habitats and species are increasingly at risk from land use changes and developments. Therefore, it is becoming increasingly necessary to take biodiversity value and ecosystem services into account when looking at plans for the future of estates and land management strategies.

The proposed site is located at Withgill, Chaigley alongside the River Hodder. Plans for the site include the development of a residential building and establishment of new parklands and wood pasture.

The onsite survey work and data collection for this report was conducted by Principal Ecologist David Pollard BSc (Hons) MRSB. The data collation, spatial analysis and document production was carried out by Senior Ecologist Sarah Woods MSc BSc (Hons) AMRSB. David has over 30 years experience in the field of Natural History and has been a professional Ecologist for the last 20 years working on a diverse range of projects. Sarah is a highly qualified and experienced Ecologist who has been working in Wildlife Management for over 10 years, specialising in Combined Human and Natural Systems.

BIODIVERSITY ASSESSMENT

Taking into account the nature and location of the assessment site and the future plans proposed for the site, our ecology team has carried out a brief assessment of the

current biodiversity value of the site and the estimated subsequent biodiversity value of the site following the completion of the proposed plans. These calculations are based solely on the landscape plan as it has been established and do not include any specific biodiversity enhancements as set out by a professional ecologist, but do reflect the extra planting and landscaping efforts that will affect biodiversity across the site.

Biodiversity has been given several different definitions since it was first coined in the early 90's as a definition for life on earth. The currently accepted definition of biodiversity is 'the variety of all living things on earth, their ecological niches and their genetic diversity'. This means that habitats, connectivity, individual plant and animal species and their metapopulations, and biotic systems are all included.

In order to accurately assess the biodiversity value of a given area, the following aspects need to be taken into consideration:

- Area of the habitat

- Local and strategic importance

- Habitat distinctiveness

- Functional connectivity

- Value for protected species

- Condition of the habitat

- Species richness, evenness and dominance

In order to prove Net Gain, a value must be produced before works are done, and then again with the planned habitat works to see if biodiversity across the site is increased.

Using the information collected from a site walkover, computer based scoping assessment of the project and remote sensing datasets, calculations of the current ecological value of the site are made using statistical and geographical modelling software. From this initial value, it was possible to determine the best prospective habitat enhancements to include as part of the overall landscape plan, and recommendations of various habitat types that will significantly enhance onsite biodiversity will be included as options within the report.

To carry out this assessment a computer model assesses all habitats and their locations within the boundaries of the site, as well as the overall site within the wider context of landscape scale ecological value. This is to determine the baseline biodiversity value of the site.

The basic methodology as to how this assessment is carried out is as follows:

1. Initially, a site visit is conducted to establish the type of habitats present on site using the Phase 1 Habitat Survey methodology.

2. Datasets regarding the topography, land use, local planning strategy and records of protected species in the area are located, downloaded and combined with the information from the walkover survey into an interactive map using Geographical Information Systems (GIS). This then forms a Phase 1 Habitat map with additional metadata that can then be used to input values into the calculator.

3. The calculator itself is an excel spreadsheet with columns for adding in information about the types of habitat, size of site and of individual habitats, habitat condition, connectivity and value for protected species. Drop down menus in each of these sections (with the exception of the site size) allow you to choose from an easy to understand definition. When selected, preset information autopopulates the multiplier columns and gives the end value for biodiversity on the site.

4. Finally, enhancement measures are proposed for the site and then are fed back into the calculator to provide a new result for biodiversity on the site, which is then compared to the original baseline biodiversity score. The enhancement measures may require revision if the 10% criteria has not been met, but the finalised output will always exceed 10% biodiversity net gain on every site as long as the mitigation and enhancement measures are put in place.

At the site at Hodder Bridge, a total of 3 separate habitat types were found during the Phase 1 survey. These included: cereal crops, modified grassland and sparse mixed woodland along the riverbank. Overall, the habitats offered relatively low distinctiveness overall and were moderately functionally connected. There was some very limited value for protected species across the site as a whole, with the thin mixed woodland offering the best value for protected species on site. The protected species that benefit best from these habitats including foraging and commuting bats and nesting birds.

The overall value for biodiversity on the site was calculated by the model to be 5.86 biodiversity units within the overall area of the site at Hodder Bridge. This value was calculated taking into account the size, connectivity, habitat distinctiveness, strategic value and protected species value of each of the on-site habitats and their placement within the wider landscape which is illustrated within the appendices.

Following completion of the proposed development works and the adjoining landscaping plan, the same set of calculations was carried out on the site taking the new habitat types and sizes into account, resulting in a value of 35.70 biodiversity units. This is an increase of approximately a 609.2% increase in biodiversity from the pre-development site estimation.

These values were calculated using a model which took values from the DEFRA Biodiversity Metric in combination with Natural England recommendations, government advice and peer reviewed scientific articles.

These calculations are estimations based on the current landscaping plan and the planned works for the site. For more detailed calculations and habitat management plans for the future, a full biodiversity enhancement plan with management strategies is recommended. A full biodiversity enhancement plan fulfils all obligations under current UK legislation with regards to wildlife and can offer more options to further enhance the extant biodiversity present on site. This can be completed at a later stage.

GUIDANCE AND LEGISLATION

Within the UK, there is a suite of environmental legislative acts concerned with the protection, conservation and enhancement of the ecological and environmental factors present within our rural and built environments. The Wildlife and Countryside Act (1981) is the primary legislation for protection of wildlife within the UK, and refers to the treatment and management of protected species listed as Schedule 1 (birds), 5 (mammals, reptiles, fish and invertebrates) and 8 (plants). Section 9 is arguably the most important part of the legislative act, as it states 'It is an offence to intentionally kill, injure, or take a scheduled species that is living wild at the time; to possess a scheduled species; to damage, destroy or obstruct access to the place of refuge used by the protected species.'

Some protected species also have European Protected Species status, and activities taking place in the vicinity of any of these species are licensed to avoid any potential negative impacts. Examples of this include any of the Bat species within the UK and Great Crested Newts, alongside others. Badgers also have their own specific piece of legislation, the Protection of Badgers Act (1992), and there are other species that also have their own specific legislation.

Other important pieces of legislation that are important to protecting and conserving the environment as a whole within the UK and in some cases Europe include the Ramsar Convention on Wetlands (1971), Convention on the Conservation of Migratory Species of Wild Animals (1979), Convention on Biological Diversity (1992), The Countryside and Rights of Way Act (2000) and the Plant Health Act (1967, amended 2008). This is by no means an exhaustive list, but these are the most important legislations with regards to the ecological protections of the UK countryside.

Another aspect of ecological conservation and protection which is coming to the forefront of modern ecological measures with regards to development and land use relates to the Biodiversity Net Gain principle. The Department for Agriculture and Rural Affairs (DEFRA) very simply describes the concept of biodiversity net gain as 'an approach which aims to leave the natural environment in a measurably better state than beforehand'. Following a recent public consultation, it has been announced in the Government's 25 Year Plan for the Environment that the No Net Loss scheme that has been used successfully in the UK will be phased out and the Net Gain approach is

going to be implemented in planning proposals across the country within the immediate future.

To avoid any contraventions of these legislative acts and to fulfil the requirements for biodiversity net gain, Rural Solutions would recommend that the proposed Ecological Assessments are carried out before works commence. For more information on how these assessments are carried out or about ecological responsibilities, please contact the ecology team at Rural Solutions Ltd using the information at the head of this document.

Appendix 1 – A brief summary table illustrating the multipliers used in the excel model. This highlights values for the site pre-development works

Habitat Type	Area coverage (Hectares)	Habitat Distinctiveness	Condition	Connectivity of the Habitat	Strategic Value	Protected Species Value	Overall Value
Cropland - Cereal crops	4.66	Low = 2	N/A =1	N/A = 1	Low (not in strategy, not good either) = 1	N/A = 1	5.401890547
Woodland and Forest - Other woodland; mixed	3.15	Medium = 3	Fairly poor = 1.5	Fairly Good = 2.5	Medium (not in strategy, ecologically good) = 1.5	Moderate = 2	41.65228545
Grassland - Modified grassland	0.23	Low = 2	Fairly poor = 1.5	Fairly poor = 1.5	Medium (not in strategy, ecologically good) = 1.5	N/A = 1	0.044412313
Sum of area:	**8.04**					**Sum of overall value:**	**47.09858831**
						Overall value divided by sum of area:	**5.858033372**

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Appendix 2 – A brief summary table illustrating the multipliers used in the excel model. This highlights values for the site post-development works

Habitat Type	Area coverage (Hectares)	Habitat Distinctiveness	Condition	Connectivity of the Habitat	Strategic Value	Protected Species Value	Overall Value
Woodland and Forest - Wood pasture and Parkland	3.01	High = 4	Fairly Good = 2.5	Fairly Good = 2.5	Medium (not in strategy, ecologically good) = 1.5	Fairly Good = 2.5	105.6448228
Woodland and Forest - Other woodland; broadleaved	4.15	Medium = 3	Fairly Good = 2.5	Fairly Good = 2.5	Medium (not in strategy, ecologically good) = 1.5	Good = 3	180.7398554
Urban - Developed land; sealed surface	0.35	Very Low = 1	N/A = 1	N/A = 1	N/A = 1	N/A = 1	0.015236318
Heathland and Shrub - Continuous Shrub	0.15	Medium = 3	Good = 3	Moderate = 2	Medium (not in strategy, ecologically good) = 1.5	Fairly Good = 2.5	0.188899254
Grassland - Lowland meadows	0.15	Very High = 5	Good = 3	Moderate = 2	Medium (not in strategy, ecologically good) = 1.5	Fairly Good = 2.5	0.31483209
Grassland - Modified grassland	0.23	Low = 2	Moderate = 2	Fairly poor = 1.5	Medium (not in strategy, ecologically good) = 1.5	Moderate = 2	0.118432836
Sum of area:	**8.04**					**Sum of overall value:**	287.0220787
						Sum of overall value divided by area:	35.69926352