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North Lincolnshire Green Energy Park

Annex 5 - Assessing Environmental
Benefits from Nature using
Biodiversity Net Gain

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North Lincolnshire Green Energy Park: Assessing Environmental Benefits from Nature using Biodiversity Net Gain

Biodiversity is a core component of natural capital, supporting the provision of environmental goods and services to people (Defra, 2025). In accordance with the Natural Capital Committee's typology, the natural assets representing biodiversity comprise 'species' and 'ecological communities'. Defra's Biodiversity Metric tool enables the measurement of biodiversity losses and gains arising from development, using habitats as a proxy (Defra, 2024). Used in conjunction with the Biodiversity Metric, Natural England's Environmental Benefits from Nature Tool (EBN tool) allows for an assessment of the wider Natural Capital benefits arising from Biodiversity Net Gain (BNG).

Although BNG is not currently mandatory for Nationally Significant Infrastructure Projects, North Lincolnshire Green Energy Park has committed to exceeding 10% BNG. The Project has demonstrated this through a detailed BNG assessment using version 3.1 of the Defra Biodiversity Metric (Environmental Statement Chapter 10, Ecology and Nature Conservation, Appendix I, Document Reference 6.2.10). Through a combination of extensive habitat creation, enhancement and reinstatement, the Metric output presents a positive change in biodiversity units. Area habitats achieve an uplift of 13.7%, whilst hedgerows and watercourses achieve over 30% and 60% uplift respectively (Table 1). With a total site area of 262 ha, significant amounts of new habitat are necessary to achieve this increase in biodiversity units, notably a large wetland mosaic; semi-natural woodlands; and a variety of grasslands. These habitats carry significant potential to deliver additional benefits, in the form of improving the resilience and stability of ecosystem services and contributing to people's interactions with the environment.

Table 1: Headline results from the Defra Biodiversity Metric calculation

Biodiversity category	Baseline (units)	Post-intervention (units)	Total net unit change	Total net % change
Habitats	611.79	695.85	84.07	13.74
Hedgerows	11.69	15.67	3.98	34.08
Watercourses	37.71	62.78	25.07	66.49

The EBN tool was used to explore the relative change in 18 ecosystem services resulting from changes in habitats associated with the Project. Baseline and post-intervention habitat data was taken directly from the existing Biodiversity Metric, covering all areas of the Project (Energy Park Land, Railway Reinstatement Land and Northern/Southern District Heat and Private Wire Networks). In order to take account of habitat enhancements, the advanced version of the EBN tool was used, which incorporates supplementary data on 38 spatial factors and condition indicators. These were entered in accordance with methodology outlined in the EBN tool User Guide (Smith *et al.* 2024). Data were informed by ecological knowledge of the existing habitats from site surveys and information regarding the proposed habitats, as outlined in the Project's Outline Landscape and Biodiversity Management and Monitoring Plan (Document Reference 5.7). Supplementary data sources comprised the Natural England Green

Infrastructure Data Portal website, LANDIS and UK Soil Observatory. The pie charts below summarise the total changes in natural capital assets (habitats) resulting from the Project (Figure 1).

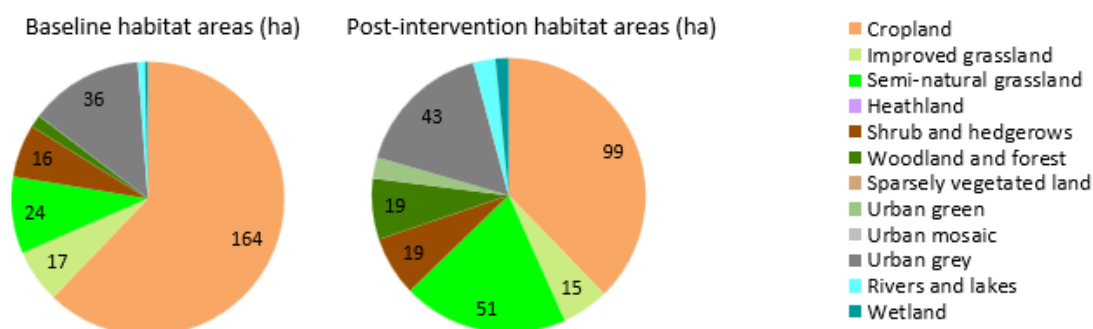










Figure 1: Changes in natural capital assets (total site area)

Key changes are driven by the replacement of arable cropland, primarily within the Energy Park land, which allows for significant increases in semi-natural grassland and woodland. A moderate increase in urban habitats reflects the built areas of development, which are linked to the introduction of urban green habitats. Moderate increases are also observed with respect the scrub and hedgerows and rivers and lakes categories. Focussing on the changed areas only (due to the significant amount of retained arable land within the site boundary), Table 2 presents the EBN tool outputs related to ecosystem services. Services are rated based on nominal scores from 0 to 10; they are not measured in biophysical or monetary units. Arrows indicate the direction and magnitude of change in the total score for each of the 18 ecosystem services at three points in time: 1, 10 and 30 years after development, compared to the baseline before the development.

Table 2: Potential Impacts of habitat change at three time points following the development

Select area of interest:	Change			Confidence
Changed area only	1 year	10 year	30 year	
Food production	↓	↓	↓	2
Wood production	→	↗	↗	2
Fish production	→	↗	↗	2
Water supply	↓	↓	↓	1
Flood regulation	→	↗	↗	1
Erosion protection	↗	↗	↗	1
Water quality regulation	↗	↗	↗	1
Carbon storage	→	→	↗	2
Air quality regulation	↓	→	↗	2
Cooling and shading	→	↗	↗	1
Noise reduction	↗	↗	↗	2
Pollination	→	↗	↗	1
Pest control	↓	↗	↗	1
Recreation	↗	↗	↗	1
Aesthetic value	→	↗	↑	1
Education	↗	↗	↗	1
Interaction with nature	↗	↗	↗	1
Sense of place	↗	↗	↗	1

Change in average score per hectare		Confidence ratings for each service	
Large decrease (more than -2.5 points out of 10)			1 The relationship between the provision of the ecosystem service and habitats is complex. Evidence for scoring/multipliers is partial, although may be stronger for some habitats than others. Evidence gaps have been filled by consulting experts and with a degree of subjectivity, particularly for cultural services.
Decrease (-0.25 to -2.5 points out of 10)			
Minor change (-0.25 to 0.25 points out of 10)			
Increase (0.25 to 2.5 points out of 10)			2 We have some suitable evidence to calibrate our range of scores across habitats and multipliers and/ or scoring applied to a limited range of habitats/ multipliers for which there is a sound and simple rationale.
Large increase (more than 2.5 points out of 10)			3 We have a strong evidence base upon which to base scores across the range of habitats and multipliers used for this ecosystem service.

The EBN results show increases in the provision of most of the assessed ecosystem services post-development. Early increases are seen in four out of five of the cultural services (green highlight), including recreation, education, interaction with nature and sense of place. Aesthetic value increases over time as habitats become established and mature. Longer term benefits are also indicated for pollination and pest control. Other regulating services (flood regulation through to noise reduction) all indicate increases in their services by 30 years post-development, and the majority by 10 years post-development. Carbon storage is shown as neutral for the first 10 years; however, this increases in the longer term relative to the baseline, likely due to the improved sequestration abilities of created habitats over time. The 65-acre wetland area has been shown to have the potential to naturally sequester up to 170 tonnes per annum of CO² (<https://www.interregeurope.eu/good-practices/rewetting-practices-for-degraded-peatlands-to-boost-biodiversity-mitigate-climate-change>). Mixed findings relate to the four provisioning ecosystem services, comprising food, wood and fish production, and water supply. A significant decrease in food production from year 1 is expected, due to the reduction in arable cropland to facilitate built infrastructure. The indicated decrease in water supply provisioning is also shown to arise due to the loss of arable land. However, the Project has accounted for potential impacts to water supply in its design, which incorporates the following mitigation:

- Recycling 97,500 tonnes of condensate from waste per year.
- All the surface run-off from the site will be used to feed the wetland area.
- The water treatment is capable of over 22m³ per hour – or 200,000 tonnes per annum.
- All incoming water to the site will be treated apart from domestic potable water which is 0.8m³ per hour.

The EBN tool is restricted to assessing habitat change only, therefore it is not able to take this mitigation into account. The use of recycled water and the surface water run-off into the wetland area is anticipated to neutralise the potential negative impact on water supply indicated by the EBN results. It should also be noted that there are positive increases in flood regulation, erosion protection and water quality regulation, which may be further improved because of the mitigation detailed above.

Overall, the EBN tool aims to provide a consistent approach for scoring 18 ecosystem services that flow from natural capital assets (habitats). Whilst it does not quantify losses and gains, it does offer a broad assessment of a wide range of ecosystem services. It is limited to capturing the impacts of habitat change on ecosystem services, so does not address non-ecosystem impacts or mitigation pertaining to a development. Applied to the North Lincolnshire Green Energy Park, it indicates increases in several ecosystem services and demonstrates the wider benefits of the project beyond biodiversity

enhancement. Furthermore, used alongside the BNG Metric, it provides an additional approach to inform future detailed decision-making on the design and location of habitats for BNG associated with the Project, to ensure the best outcomes for nature and people.

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