Habitat loss from major infrastructure projects: The case for action

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Wildlife and Countryside LINK

Executive Summary

The 25 Year Plan for the Environment contained a commitment to address habitat loss by embedding an 'environmental net gain' principle for development, including housing and infrastructure. Whilst this principle is being brought forward for housing development through biodiversity net gain (BNG) proposals in the Environment Bill, the infrastructure element of this commitment has not been progressed.

This paper highlights the habitat impacts of three representative major infrastructure projects to demonstrate the high cost of this omission. The paper recommends bringing major infrastructure projects into the Environment Bill's BNG regime to prevent further habitat loss, whilst also delivering economic benefits.

Development is driving habitat loss

Nature continues to decline at pace in the UK. The latest State of Nature report, the most comprehensive health check on wildlife carried out by conservation organisations, notes that *'the abundance and distribution of the UK's species has, on average, declined since 1970. Many measures suggest this decline has continued in the most recent decade. There has been no let-up in the net loss of nature in the UK'*.[1]

The report cites development as a key contributing factor to this decline, highlighting that *'development for housing, industry and infrastructure projects such as road and rail result in a loss of natural habitats, as well as fragmentation and change to those that remain'*.[2] The natural habitats that development destroys are the habitats that wildlife species need to live, feed and breed in. Two habitats have been hit particularly badly - 2,505km2 of grassland (an area the size of Dorset) and 1,121 km2 of arable farmland (an area the size of Bedfordshire) have been lost to urban development in Great Britain since 1990.[3]

Biodiversity net gain is currently limited in scope

The Government has responded to nature's decline by publishing the 25 Year Plan for the Environment[4], their strategy for restoring the natural world back to health, and by introducing the Environment Bill[5] to put key restoration measures into legislation. One such measure responds directly to the development pressures on wildlife – biodiversity net gain (BNG). The Bill introduces a new BNG

[1] https://nbn.org.uk/wp-content/uploads/2019/09/State-of-Nature-2019-UK-full-report.pdf p6
[2] Ibid p32
[3] https://www.ceh.ac.uk/press/almost-2-million-acres-gb-grassland-lost-woodland-and-urban-areas-expand
[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf
[5] https://services.parliament.uk/bills/2019-21/environment.html

condition to planning permissions granted in England, requiring a biodiversity gain plan to be submitted and approved by the planning authority before development can lawfully commence. The biodiversity gain plan is required to contain an assessment of the value of natural habitats before development and after development – and ensure that at least a 10% net gain is achieved between the earlier and later values. [6] A new biodiversity metric is being developed to allow such calculations to be made.[7]

Implemented well, BNG could be an be an effective tool to ease development pressures on wildlife. However, the policy's impact will be limited by the decision to exempt major infrastructure projects from the new planning condition. Major infrastructure projects (delivering either energy, transport, water, wastewater and water infrastructure) are mostly granted by Development Consent Order, with the majority being considered through the Nationally Significant Infrastructure Projects (NSIPs) regime. The 25 Year Plan for the Environment, which first proposed the concept of BNG, was explicit in stating that it would cover both housing and infrastructure development.[8]

The subsequent decision to exempt major infrastructure projects from BNG appears to have been taken because of a concern that it would cause delays in the delivery of infrastructure. As set out by Minister Pow in Environment Bill Committee *''introducing a new legal requirement for such projects now could lead to significant delay and increased costs for projects in the pipeline, hampering our ability to build back better in future generations''*.[9] This justification for inaction does not stand up to scrutiny, as there will never be a time when major infrastructure projects are not in the pipeline. An argument against changing requirements to prevent disruption to current applications is an argument against any change to the system, at any time.

Minister Pow did confirm that the Government still has an intention to apply some form of BNG to major infrastructure at a future date, stating that *''to ensure that we consider the best way to introduce any requirement for biodiversity net gain for major infrastructure, we need to consult on further details, which we will in due course''*.[10] As of early 2021, the Government position remains that consultation on BNG for major infrastructure will take place *'in due course'*.[11]

There is a cost to delay

Due course will be too late for too many habitats. The current rules around biodiversity for major infrastructure projects are limited in ambition and vague in expression, leading to significant habitat losses across the country.

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[6] https://www.wcl.org.uk/docs/Environment_Bill_nature_clauses_briefing_from_Greener_UK_and_Link_0.pdf
[7] http://publications.naturalengland.org.uk/publication/5850908674228224
[8] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf p32
[9] https://www.theyworkforyou.com/pbc/2019-21/Environment_Bill/22-0_2020-11-26a.715.5?s=NSIP#g715.8
[10] Ibid
[11] https://www.theyworkforyou.com/wrans/?id=2020-12-08.126794.h&s=speaker%3A11455#g126794.q0
https://www.theyworkforyou.com/wrans/?id=2020-12-09.127521.h&s=speaker%3A24910#g127521.q0
https://www.theyworkforyou.com/wrans/?id=2020-12-09.127522.h&s=speaker%3A24910#g127522.q0

Major projects must follow requirements set out in a series of National Policy Statements. These statements share the same core biodiversity section, which is copied below. This example is taken from the National Policy Statement for Energy, which covers energy major infrastructure projects:

'As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives (as set out in Section 4.4 above); where significant harm cannot be avoided, then appropriate compensation measures should be sought'.[12]

Only the National Policy Statement for National Networks (covering road and rail major infrastructure projects) goes into significant further detail, adding a footnote on biodiversity offsets as a form of compensation. The footnote states '*the goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity'.*[13]

As such, the current biodiversity requirement that major infrastructure projects must meet is *'to aim to avoid significant harm'*. This loosely defined requirement falls well short of the BNG policy, which mandates a rigorous assessment of pre-development and post-development biodiversity value, with a requirement to achieve a 10% uplift in the latter. Only the footnote in the National Policy Statement for National Networks hints at a such an approach, but this only applies to offset measures.

A requirement to *aim* to avoid biodiversity harm constitutes a much lower bar than a requirement to *achieve* net biodiversity gain. This bar can be met even when major infrastructure projects destroy significant quantities of natural habitat with limited compensation.

This cost is undermining the Government's environmental programme

Link has studied the environmental impacts of three major infrastructure projects consented in the past decade under the current regime, using the Environmental Impact Assessment (EIA) supplied with each application. This indicative study, the full details of which can be found as an appendix, has found that the three projects will, once fully completed deliver 294.4ha of new non-linear habitats. This is set against the destruction of 798.99ha of existing non-linear habitat.

The scale of this overall habitat loss, much of it established habitat, and the limited nature of replacement habitat – most of which will take years to mature – suggests that application of the biodiversity metric would find a net adverse impact from the three projects.

Overall, the three projects will result in a net loss of 504.59ha of natural habitat. To put this number in context, in December 2020 the Government announced a £12.1 million 'community forest' funding commitment to plant 500ha of new woodland in England. [14]

[12] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf p70

[13] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf p52

[14] https://www.gov.uk/government/news/500-hectare-planting-boost-for-englands-community-forests

The equivalence of the two figures illustrates the cost of not adopting BNG for major infrastructure projects in England. The biodiversity, climate and community benefits of a £12.1 million Government investment in nature will be offset by the habitat loss from just three major infrastructure projects.

This is the tip of the iceberg. The three projects included in the study represent 25% of NSIPs consented in one region (Eastern) over the past decade. England has eight other regions. Major infrastructure projects can also be consented outside of the NSIP regime, through hybrid bills in Parliament. One hybrid bill infrastructure project alone, HS2, has generated significant concern regarding its impact on ancient woodland sites, Sites of Scientific Interest (SSSIs), and Local Wildlife Sites. [15]

The scale of habitat loss is also likely to increase over the coming years, given the Government's commitment to major infrastructure[16] and proposals to include large housing developments under the NSIP regime for the first time.[17] Major multi-faceted development projects, such as the proposed Oxford-Cambridge Development Arc, are imminent.[18] Given this expected increase in major infrastructure projects, the Government should urgently undertake an assessment of the cumulative impact of major infrastructure on the environment across the country. Without such prior assessment, the culminative impact on natural habitats could only be understood when it is too late.

The continued net loss of habitat as a result of major infrastructure projects is undermining the Government's work to reverse the decline of nature in England.

Applying Biodiversity Net Gain makes environmental and economic sense

Urgent action, through amendment of the Environment Bill when it returns to Parliament in early summer 2021, could apply BNG to major infrastructure projects. This would ensure that net biodiversity gain is delivered from all major infrastructure projects, addressing the sustained habitat destruction that is undermining efforts to restore the natural world. Rather than undermining the Government's environmental work (as at present) major infrastructure could enhance it, with major infrastructure net gain contributing significant new habitats to the England Tree Strategy and other key environmental programmes.

This pressing environmental argument for BNG extension is complemented by an economic case.

The provision of a standardised system of biodiversity assessment through BNG is likely to streamline infrastructure applications, rather than cause delay as was suggested in Bill Committee. The nature sections of the three EIA's studied in this paper each amount to hundreds of pages, with the full EIA's

[15] https://www.wildlifetrusts.org/sites/default/files/2020-01/What%27s%20the%20damage%20-%20Summary%20Report%20FINAL%20digital%202.pdf
[16] https://www.gov.uk/government/speeches/pm-economy-speech-30-june-2020
[17] https://www.gov.uk/government/consultations/planning-for-the-future
[18] https://www.rspb.org.uk/about-the-rspb/about-us/media-centre/press-releases/double-nature-in-the-oxcam-arc-to-match-economic-ambition/

topping a thousand. This is a direct result of the vagueness of the current rules on biodiversity, which requires the applicant to demonstrate an aim (to avoid significant harm to biodiversity) without providing clear guidance on how to do so. In response applicants understandably adopt a 'try a lot and see what sticks' approach. As a standardised assessment method for direct habitat impacts, BNG would constitute an effective tool for use in key parts of the EIA process. This would help streamline assessments and provide greater applicant certainty.

Finally, it is important to remember why infrastructure is needed – to provide the services on which our economy is built. There is however a deeper foundation to our economic life, described in Professor Dasgupta's report on the economics of biodiversity:

'We are part of Nature, not separate from it. We rely on Nature to provide us with food, water and shelter; regulate our climate and disease; maintain nutrient cycles and oxygen production; and provide us with spiritual fulfilment and opportunities for recreation and recuperation, which can enhance our health and well-being. We also use the planet as a sink for our waste products, such as carbon dioxide, plastics and other forms of waste, including pollution. Nature is therefore an asset, just as produced capital (roads, buildings and factories) and human capital (health, knowledge and skills) are assets.

Humanity faces an urgent choice. Continuing down our current path – where our demands on Nature far exceed its capacity to supply – presents extreme risks and uncertainty for our economies.'[19]

A shortfall in infrastructure is a short-term economic problem, the erosion of biodiversity is an existential economic threat. Attempting to fix the first problem through exacerbating the latter will simply make things worse. We cannot continue to plug gaps in the stonework of our economy by digging away at its foundations.

New infrastructure and biodiversity net gain can, and must, be delivered in tandem.

Key recommendations

- A consultation on applying biodiversity net gain (BNG) to major infrastructure projects should be launched without delay, informed by the research already undertaken by Defra.
- The Environment Bill should be amended to extend BNG to major infrastructure projects when it returns to Parliament in summer 2021.
- The new system should apply from 2023, allowing for a two-year transition period from the Environment Bill receiving Royal Assent (in line with the housing element of BNG).

[19] https://www.gov.uk/government/publications/final-report-the-economics-of-biodiversity-the-dasgupta-review

Appendix - case studies

The following case studies look in detail at three major infrastructure projects consented in the past decade, highlighting biodiversity impacts as described in the Environmental Impact Assessment (EIA) supplied with each application. It should be stressed that each application met current biodiversity tests and that biodiversity shortfalls because of the development can be attributed to a flawed system, not individual applicants who have to work within it.

A14 Cambridge to Huntington Improvement Scheme

Upgrades to 21 miles of the A14, including a new bypass. Development Consent Order granted in 2016. Work completed in 2020. Length of nature chapter of EIA: 134 pages.

Overall losses in on-site habitat from the scheme:

- 757.6ha of arable farmland.
- 1.59ha of running water, standing water and swamp.
- 6.36km of dry ditches.
- 0.87km of linear trees [20].

Overall gains in on-site habitat from the scheme:

- 184.9ha of grassland and 7.8ha of scrub.
- 83ha of woodland plantation and wooded parkland.
- 4.51km of wet ditches.
- 28.35km of hedges.[21]

Impact on protected sites:

- Lost habitats include 0.9ha lost at a Local Wildlife Site - Buckden Gravel Pits County Wildlife Site (CWS) - comprising 0.3ha open water, 0.3ha swamp, 0.3ha grassland.[22] The EIA notes that the highest numbers and richness of species across the project survey area were found at the CWS. The 0.9ha lost represents a portion of the CWS, the rest remains intact (although it is now adjacent to a major bypass).

Species impacts:

[20] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010018/TR010018-000675-A14%206.1%20ES%20Chapter%2011.pdf p75 (calculations made using net permanent gain column in table, with some row results combined together for clarity of presentation).
[21] Ibid
[22] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010018/TR010018-000675-A14%206.1%20ES%20Chapter%2011.pdf p70

- After mitigation, the overall impact of the project when operational was considered to be 'moderate adverse' in the following areas: Disturbance to breeding birds, disturbance to roosting bats, mortality to bats.
- After mitigation, overall impact of project when operational was considered to be moderate beneficial on one area; habitat gain for bats[23]. This benefit is likely to be limited, given the simultaneous adverse impact on roosting facilities for bats.

Observations:

- The 192.7ha of new habitat and 32.3km of new linear habitat created by the scheme is welcome but must be measured against the 759.2ha of habitat and 7.2km of linear habitat lost through it.
- The EIA suggests that the main area of habitat loss, arable land, should be *'considered to be of relatively low ecological value'* as it is *'abundant widespread in the local area'* meaning that *'the loss of this habitat type would not be considered significant'*.[24] Relative to the concrete that replaced it, the lost arable land had much ecological value. Farmland birds rely on seeds, insects and other food sources which are found specifically on farmland, with some birds using cropped areas for nesting also[25]. Small mammals use arable fields for food, shelter, and nesting for large parts of the year[26]. Brown hares, a priority species under the UK post 2010 biodiversity framework, rely on arable fields as a vital part of their habitat[27]. Crucially, arable land also has the potential to be improved by Environmental Land Management to become a higher value habitat[28]. That potential, heightened by the passing of the Agriculture Act in 2020 and its requirement for ELM to be applied to farmed land[29], has been permanently lost across 757.6ha because of the project.
- The two largest areas of new habit creation will consist of new hedges and woodland, planted to replace existing hedges and woodlands removed by the scheme. Whilst the amount of new planting will exceed the amount of existing habitat lost, resulting in a net permanent gain in the extent of these habitats, it is important to highlight that hedges and woodland require years to mature[30]. Species on the project site will see a loss in both habitats for this lengthy period, until the new planting fully matures. It is also unclear how the new habitat will be secured in perpetuity.
- It seems reasonable to suggest that a retrospective BNG assessment, after fully considering the balance and value of different habitat losses and creations through the biodiversity metric now being developed could well find an overall net biodiversity loss for the project when

[23] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010018/TR010018-000683-A14%206.1%20ES%20Chapter%2019.pdf p6
[24] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010018/TR010018-000675-A14%206.1%20ES%20Chapter%2011.pdf p72
[25] https://www.agricology.co.uk/sites/default/files/Birds.pdf
[26] https://www.agricology.co.uk/sites/default/files/Mammals.pdf
[27] https://www.wildlifetrusts.org/wildlife-explorer/mammals/brown-hare#:~:text=It%20is%20most%20common%20in,of%20young%20trees%20and%20bushes.
[28] https://www.wcl.org.uk/hope-for-our-farming-future.asp
[29] https://www.gov.uk/government/publications/the-environmental-land-management-scheme-an-overview
[30] https://www.woodlandtrust.org.uk/plant-trees/advice/care/

factoring in the additional effects of the Local Wildlife Site land loss and operational impacts on species.

Port of Tilbury Expansion

Construction of a new port facility in Tilbury, Essex. Development Consent Order granted in 2019. Work underway. Length of nature chapter of EIA: 388 pages.

Overall losses in on-site habitat from the scheme:

- 9ha of open mosaic habitat on previously developed land.
- 2.6ha of coastal and grazing marsh.
- 2.2ha of woodland.
- 812m of hedge.[31]

Overall habitat maintained on site from the scheme:

- 0.6ha of reedbed (0.6ha destroyed on site replaced on site).[32]

Overall on-site habitat gains created from the scheme:

- 2,600m2 of ponds.[33]

New habitats created offsite by the scheme:

- 9.1ha of open mosaic habitat on previously developed land.
- 6.2ha of coastal and grazing marsh.[34]

Impact on protected sites:

- The project affects three Local Wildlife Sites (LWS). One 2.8ha LWS, the Tilbury Centre, will be completely lost, with Lytag Brownfield LWS losing 11.7ha (out of a total 12.4 ha) and Tilbury Marshes LWS losing 2.5ha (out of total 39.8ha). [35]
- The project also affects the Thames Estuary & Marshes Special Protection Area, through 0.063km2 of river dredging, removing 110,000m3 of sediment. [36] The EIA notes that '*The release of contaminants into the Thames Estuary could occur from dredging'*.

[31] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000213-6.1%20Environmental%20Statement.pdf p10-208
[32] Ibid
[33] Ibid
[34] Ibid
[35] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR030003/TR030003-000213-6.1%20Environmental%20Statement.pdf p10-202
[36] Ibid p11-84

Species impacts:

- The EIA proposed the physical removal of a range of mammals and reptiles from the lost on-site habitats to the new habitats created offsite. Species requiring physical capture and transportation to newly created off-site habitats included water voles, common lizards, slow worms, grass snakes and adders, with the EIA noting that *'translocation is disruptive to reptile populations and 100% survival rates cannot be guaranteed (particularly for more sensitive species such as adder)'*.[37] Similarly, a new artificial badger sett and bat boxes were created offsite to compensate for a badger sett destroyed on-site, along with key bat habitats.

Observations:

- The port project necessitates the destruction of the majority of on-site habitat, including substantial quantities of open mosaic habitat, marsh, woodland and reedbed. Like for like on-site replacement of lost reedbed and the offsite creation of new open mosaic and marsh habitat is provided to compensate for some of this loss[38]. Woodland and hedge loss is not compensated.
- The compensation of off-site open mosaic and marsh habitat is likely to be of lower value than the destroyed habitat on site. This destroyed habitat includes 17ha of established and nature-rich habitats on LWS land, of higher biodiversity value than new off-site habitats that will take years to mature. If BNG had been applied, this long wait for full habitat maturity would have been factored in, and a greater quantity of compensation habitat required as a result. When combined with the disruption and risks posed to species by translocation to new off-site habitats, it seems likely that the balance of habitat loss and habitat compensation for open mosaic habitat and marsh will result in net loss. Rare reedbed habitat will also be lost on site, with like-for-like replacement taking years to establish.
- The shortfall in compensation for significant habitats destroyed on-site, combined with expected dredging impacts on the Thames SPA, suggests that a retrospective BNG assessment would find overall net biodiversity loss from the project.

Progress Power Station

Construction of a new gas fired power station at Eyre, Suffolk. Development Consent Order granted in 2015. Work delayed. Length of nature chapter of EIA: 161 pages.

Overall losses in on-site habitat from the scheme:

- 26ha of arable land.[39]

Overall gains in on-site habitat from the scheme:

[37] Ibid p10-206

[38] The applicant provides detail about the off-site habitat creation here: http://www.tilbury2.co.uk/wildlife-mitigation/

[39] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010060/EN010060-000232-6.1%20Environmental%20Statement.pdf p264 and p301

- 2.8ha of woodland.
- 0.5ha of grassland.
- 811m of hedges. [40]

Species impacts:

- The EIA notes the presence of brown hares on the site and concludes that the loss of arable land habitat loss would lead to the *'displacement of brown hares into the surrounding remaining suitable habitats and would be a permanent adverse effect of medium magnitude'*.[41] The EIA also noted expected mortality of brown hares during construction.
- The creation of new woodland and hedges will provide new refuge habitat for hares. The EIA states that this new habitat will also benefit foraging and commuting bats, breeding birds and great crested newts[42].

Observations:

- The gains in woodland and grassland, and in linear hedgerow habitat, must be seen in the context of a significant loss in arable land. The EIA suggests that *'this habitat is widespread within the local area and in the wider area, supporting very little biodiversity interest.'*[43] However, as stated on page 7, arable land does have biodiversity value – and the potential for that value to be increased when Environmental Land Management is applied. The projected mortality and displacement of brown hares because of the on-site arable habitat loss is another indicator of this value. The loss of arable land will also have negative impacts for farmland birds, including corn bunting and skylark populations observed in the area.
- The new woodland, grassland and linear hedgerow habitat will deliver a net gain in habitats for bats, breeding birds and great crested news. This is to be welcomed.
- A retrospective BNG assessment would balance the loss of the arable habitat against the value of the woodland, grassland and hedgerow habitat creation. The contribution of the new gas fired power station to climate change, a key driver of biodiversity decline, could also be factored into the broader environmental assessment. [44] Another new gas power station, located in Yorkshire, has been subject to legal challenge on climate grounds, with plans subsequently withdrawn.[45]

[40] Ibid p300 (AIS model used for habitat gain from Electrical Connection Compound part of project. Hedgerow figure calculated by subtracting existing hedgerow lost from new hedgerow planted.)
[41] Ibid p302
[42] Ibid p326-331
[43] Ibid p269
[44] https://nerc.ukri.org/research/partnerships/ride/lwec/report-cards/biodiversity/
[45] https://www.clientearth.org/latest/latest-updates/news/climate-win-as-drax-scraps-gas-mega-plant-in-uk/