United Kingdom Biodiversity Crisis: Evaluation of British Governance for Terrestrial Biodiversity Conservation (Offsetting and Legislation)

University of Warwick, 2021

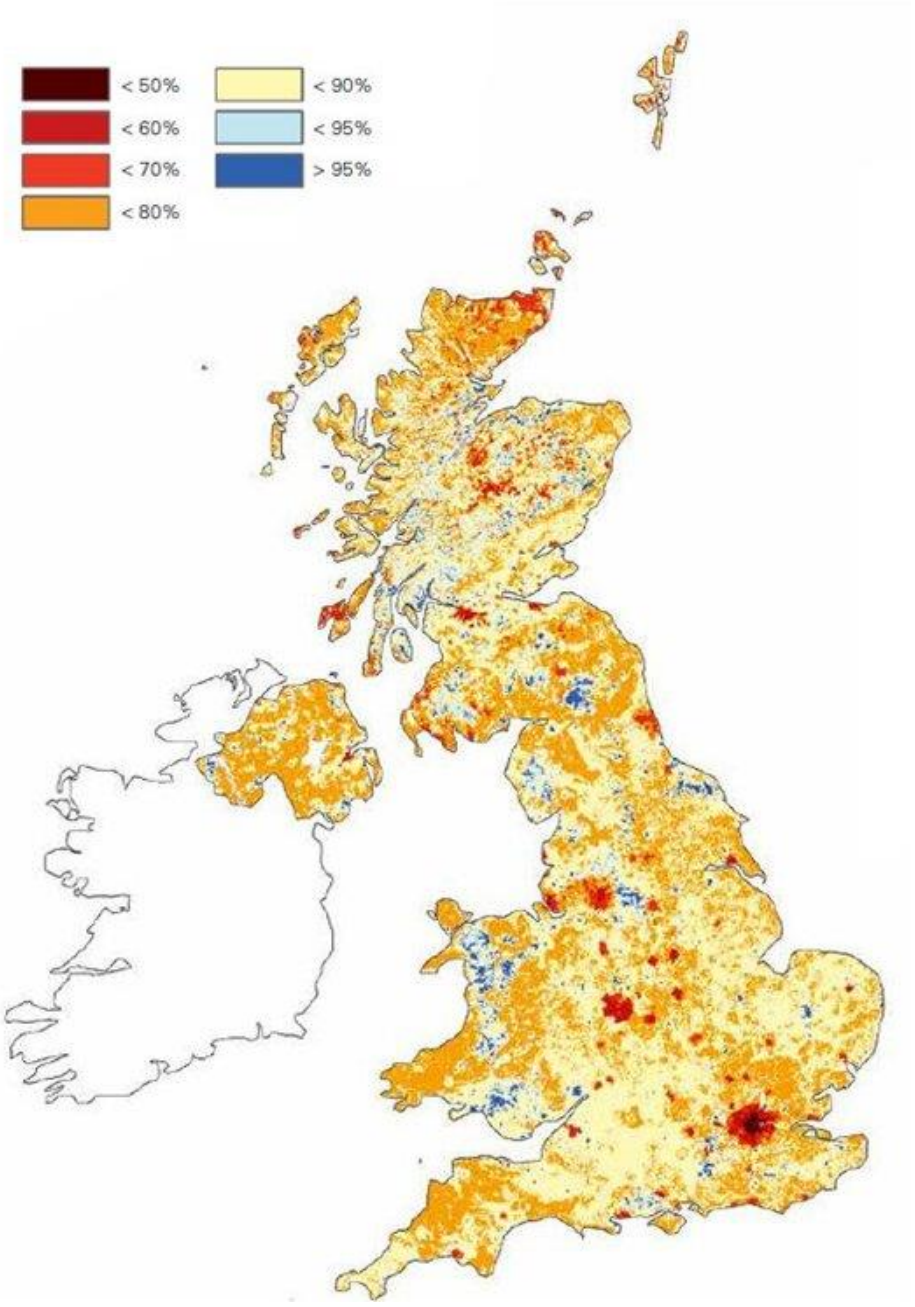

Figure 1: Map of estimated "biodiversity intactness" over the UK (Hayhow et al., 2016:70)

Executive Summary:

Biodiversity loss has severe implications for our society's ability to develop sustainably. Declining biodiversity results in the reduced efficacy of ecosystem services, vital for human well-being. Within the UK, biodiversity is still depleting, despite the presence of governance schemes aimed at protecting it. A consistent increase in the proportion of wildlife threatened with extinction highlights the dire need for change. Site-by-site equivalent biodiversity offsetting has limited positive effects for biodiversity conservation and minimal enforcement of environmental legislation reduces the severity of the issues at hand. Through re-evaluation of these schemes, there is potential to conserve biodiversity. Strategic biodiversity offsetting takes into consideration the efficiency of potential offset sites, prior to its implementation, in relation to present and future development prospects. This has the potential to conserve and even increase biodiversity. In addition, legislation reform may prevent high levels of environmental crime occurring as harsher punishment would act as a deterrent. Development companies should also be held legally responsible for calculating the severity of their impacts upon biodiversity levels, in addition to taking actions to conserve biodiversity at equal levels to the impacts of their development schemes. This way, the severity of biodiversity loss has greater potential to be understood whilst also being conserved more effectively.

Key Definitions:

-Biodiversity: Variety among genetics, functional traits and species. (Cardinale et al., 2012)

-Ecosystem functions: Processes that occur ecologically which control the flow of nutrients, energy and organic matter in an ecosystem. (Cardinale et al., 2012)

-Ecosystem services: Benefits provided to humanity by ecosystems. Included within these are **provisional services** (food, wood, water), **regulating services** (climate, disease, water quality regulation), **supporting services** (cycling of nutrients, photosynthesis, soil) and **cultural services** (provide spiritual, educational and recreational benefits) (MEA, 2005)

-Biodiversity offsetting: Conservation actions to compensate for damage done to biodiversity, by development projects, to guarantee no net loss of biodiversity (IUCN, 2021)

Foundational Science: Discussion & Analysis

Terrestrial biodiversity is the diversity of species and ecosystem in an on-land area (JNCC, 2020). Over the last two decades much research has been undertaken to highlight the complex, yet integral, relationship between species biodiversity and ecosystem functions, which ultimately then impacts ecosystems services (Cardinale et al., 2012).

Ecosystem reactions to changes in biodiversity, and how that affects us:

Cardinale et al. (2012) have summarised the agreed upon findings surrounding biodiversity loss and its impacts on ecosystems. Firstly, increased biodiversity allows for the stable functioning of an ecosystem. Greater diversity of populations leads to more stability within the ecosystem over time. This consensus is also supported by a second finding- the mounting evidence that biodiversity loss ultimately leads to the reduction of efficiency within ecological communities, when undertaking supporting and regulating services. The more effective ecosystem functions are, the greater number of benefits humans may derive from them through services. Biodiversity, therefore, has many wider implications for human society and global sustainable development as a whole. Sustainable development encompasses many factions of human well-being, highlighted through the different goals outlined to protect them (Figure 2).

Figure 2: SDG Goals (UN, no date)

The delicate balance of diversity within the biosphere is vital for positive contributions to the SDGs (See Table 1). Biodiversity loss is a serious issue that could disrupt these processes and cause. This disruption could then create damaging effects to all scales of human society.

SDG	Direct biodiversity contributions
1: Poverty	Provides resources, a source of income, natural infrastructure to protect against natural hazards
2: Food Security	Improves diet, crop pollination and yield, pest control
3: Well-being	Provides medicines, improves immunity and air quality, reduces recovery time in hospital
6: Water	Reduces pollution, the abundance of heavy metals in the environment and run-off
7: Energy	Provides power sources and reduces energy use
8: Economic Growth	Provides employment, market and non-market goods and sustainable economic growth
9: Infrastructure	Provides green technology which is environmentally sound
11: Cities	Reduces air and noise pollution and economic losses from natural disasters, promotes identity and improves mental health and well-being

Table 1- Contributions that biodiversity has towards sustainable development (Blicharska et al., 2019:1086-1087)

Current biodiversity in the UK

Biodiversity is rapidly declining in the UK and with 'more than one in ten UK species threatened with extinction' (Weir, 2018:876) it is evident that more must be done to protect them. Although several of the Biodiversity Indicators for 2020 appear to be improving, both in the short and long term, many key indicators and measures have either stagnated or declined. Examples of this include: the status of UK priority species, the status of UK habitats and species of European importance, countryside birds and pollinating insects (DEFRA, 2020: 5-6) Currently there is strong evidence of species and population decline as well as reductions in their distribution. Overall, since 1970, there has been a 41% reduction in the abundance of species with 15% of species being threatened with extinction. (Hayhow et al., 2019:6). These are shocking figures as they insinuate that, of the 8,431 species assessed, approximately 1,188 species in the UK are threatened with extinction (Hayhow et al., 2019:9) which is up from 2016 when 1,057 were threatened (Hayhow et al., 2016:9) and 2013 when 755 were threatened (RSPB, 2013:12).

Assessment of Existing Governance

Two UK governance strategies implemented to conserve biodiversity are offsetting and legislation.

Biodiversity Offsetting: (In this paper, the term 'offsetting' pertains to the actions surrounding the conservation and protection of similar ecosystems to those being lost through development schemes, keeping biodiversity loss to a net zero.)

Offsets (the protected areas) are advertised as the solution to the conflict between those who believe it is unjust to continue developing infrastructure in a way that ineffectively protects biodiversity and others who advocate that slowing economic growth is not an option (DEFRA, 2013) allowing for biodiversity loss in one area, due to development, with equal biodiversity gain elsewhere. The theory, for development companies, is attractive as it is predictable, practical, and cost-efficient; their environmental damage is addressed and offsets can be relocated spatially and temporally (Apostolopoulou and Adams, 2015). However, although the theory should facilitate continued economic expansion alongside environmental conservation, only 53% of the English public were in favour of introducing offsetting in England; many voiced concerns that it would lead to a net loss of biodiversity, it seemed wrong to place financial value to nature and that it was an unrealistic goal to replicate complex environmental systems for this developmental gain (DEFRA, 2016: 2). Although six successful trial runs occurred in England, mixed results were observed in the following years. The expectations for sustainable development were flawed as people abandoned the scheme, realising suitable offset areas were expensive or hard to locate (Apostolopoulou and Adams, 2019).

As a result, it seems important to re-evaluate the design of current offsetting governance as scientific theory implies the great potential it can have. Alongside legislation reform, the importance of environmental issues will be understood further, allowing companies to feel more comfortable spending the time and money on the schemes.

Legislation

In the last few decades, many legislations (both hard and soft) have been executed to conserve biodiversity in the UK.

Hard laws: One example of legislation to preserve biodiversity is the Natural Environment and Rural Communities Act 2006. This act called for the creation of a list on which all habitats and species that are of principle importance for the conservation of biodiversity would be placed. In addition to this, actions should be taken to protect these animals (Natural Environment and Rural Communities Act 2006). Hard laws require public bodies to ensure considerations are taken surrounding biodiversity conservation when functioning (DEFRA, 2015). Enforcing these laws seem less effective, however, as Watson (2005:3) highlights how generally only 700 out of 50,000 environmental incidents are prosecuted. In addition, a considerable number of environmental laws are anthropocentric, assuming the superiority of humans over the environment, that humans are not limited by the planetary boundaries and have power over natural processes. This ultimately causes a failure in their effectiveness at preserving the environment (Latios et al., 2014)

Soft laws: International protocols allow soft laws to be implemented. The UK agreed to the Nagoya Protocol whereby all those party to it must share genetic resources to conserve biodiversity (Morgera et al., 2014). The issue with many protocols is that they are not legally binding. It is possible to create hard laws to regulate the legality of these protocols but again the issue of enforcing them is present.

To combat the downfalls of current legislation, the initial severity of the offences must be unequivocally understood. A potential option for this would be by reforming how ecological violations are viewed by companies and the public, through the weight of punishment they carry when prosecuted.

Governance Recommendations

In the Lower Hunter Valley, Australia, there has been a successful implementation of offsetting. 60% of this region has native vegetation as well as a myriad of threatened species (Kujala et al., 2015:514). There are 5 main ecosystems within this area that the offsetting scheme aims to preserve: wetlands, woodlands, heath, swamp and moist forest (DECCW, 2009). Research surrounding the efficacy of possible offsetting schemes within the area was undertaken, calculating their efficiency in relation to the potential exploitation of future mining sites. Situations were examined where the impact of mining activity was offset by protecting existing vegetation, restoring it or a combination of the two. This was called strategic offsetting as it allowed for the analysis of the scheme's efficiency before implementation rather than the more typical like-for-like offsetting. The research concluded that, by undertaking offsetting over specific prioritised areas, the benefits for all the species affected may be mapped more effectively. In addition, standard ecologically equivalent offsetting would have a resulted in a 10% reduction in biodiversity within the area whereas this strategic offsetting would increase biodiversity by 10% (Kujala et al., 2015:519-520). Poorly monitored and enforced site-by-site offsetting will likely offer less protection for biodiversity loss (Quetier and Lavorel, 2011) in the UK. By applying a strategic offsetting scheme here, whereby potential offset sites are analysed for their efficiency prior to their use, current and potential future damage to biodiversity could be mitigated against. In addition, not only would biodiversity remain constant, but it may also increase, offering even greater environmental potential.

In China there is much legislation surrounding biodiversity conservation, classified under environmental, ecosystem and species protection and pollution prevention (McBeath and Leng, 2006). These enforceable laws allow those who perpetrate them to be incarcerated. By enforcing

such strong punishment for environmental damage, the crimes' severity is acknowledged whilst also acting as a preventative measure, dissuading people from committing an offence. It has been recorded previously that crime in the UK reduces when effective enforcement of incarceration laws occurs (Newburn, 2007). If breaking environmental laws in the UK resulted in harsher punishment it has the potential to also be a deterrent for incidents, as well as increasing awareness, highlighting how environmental issues have equal importance to societal ones. Amending current laws to have harsher punishments would allow for these results to be observed. In addition, under the Environmental Impact Assessment (EIA) Law, China demands that construction companies must undertake environmental assessments for projects and hold public hearings if the impacts are deemed major (McBeath and Leng, 2006). Although under the Natural Environment and Rural Communities Act 2006 'every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity' (Natural Environment and Rural Communities Act 2006), the degree to which public bodies must help protect biodiversity is unclear. By holding British companies and public bodies accountable, by enforcing laws that require they evaluate their impacts, and take action to conserve biodiversity to the same extent that their development is depleting it, biodiversity may be protected. In addition, if public discussion were mandatory for projects over a certain level of projected biodiversity loss, the requirement for such development to be undertaken could be debated. If deemed too harmful to compete with the development's benefits by the public, action could be taken to stop the development from beginning and protect the biodiversity.

Conclusions

UK policy to mitigate against biodiversity loss is inefficient in its current state so changes must be considered. Strategic offsetting has the possibility to increase biodiversity, protecting species from current and future development impacts. Increasing the legal responsibility companies have for assessing their activities' impacts on the environment, encourages reflection and change to environmentally damaging actions. Finally, harsher punishment for breaking environmental law acts as a deterrent, reducing the proportion of offences and therefore negative impacts on biodiversity. To implement these new policies, government ministers should present them to Parliament in relation to the current Conservative government's pledges to prioritise

environmental protection through increased funding within the 2021 budget. This way, greater interest and time may be devoted to this vital discussion.

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