
Written Statement:

a) Environment (Wales) Bill 2016 – Section 6 duty and Section 7 Species
b) Well-being of Future Generations (Wales) Act 2016 Resilient Wales Goal
c) Section 28G of the Wildlife and Countryside Act
d) M4 CaN - Consideration of Priority Species in Wales

ON BEHALF OF

GWENT WILDLIFE TRUST

AUTHOR: JAMES BYRNE

In the matter of:

Public Local Inquiry into the M4 relief road around Newport: The effects of the proposed M4 extension across the Gwent Levels:

February 2017

LEGISLATIVE CONTEXT:

1. In advancing the proposals outlined for the M4 CaN scheme the Welsh Government has breached the following statutory duties:

   - The duties under sections 6 and 7 of the Environment (Wales) Act 2016 to:[1] [2]
     - '***Maintain and enhance biodiversity'*** including those on the Section 7 list[3]
     - ***'apply the principles of sustainable management of natural resources'***

   - They duty under section 28G of the Wildlife and Countryside Act 1981[4] . This places a duty on public authorities (including Ministers), in exercising their functions so far as they are likely to affect the flora, fauna or geological or physiographical features by reason of which a Site of Special Scientific Interest (SSSI) is of special interest, to "**take reasonable steps, consistent with the proper exercise of their functions, to further the conservation and enhancement of those features**."

   - Duties under the Wellbeing of Future Generations (Wales) Act 2015[5] requiring Welsh Ministers to maximise their contribution to achieving each of the well-being goals (section 3) which include A Resilient Wales (section4) is *a "nation which **maintains and enhances a biodiverse natural***

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[1] **Environment (Wales) Act - Section 6 (Biodiversity and resilience of ecosystems duty)**
(1) A public authority must seek to maintain and enhance biodiversity in the exercise of functions in relation to Wales, and in so doing promote the resilience of ecosystems, so far as consistent with the proper exercise of those functions.

[2] **Environment (Wales) Act - Section 7 (Biodiversity lists and duty to take steps to maintain and enhance biodiversity)**
(1) "The Welsh Ministers must prepare and publish a list of the living organisms and types of habitat which in their opinion are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales.
(3) Without prejudice to section 6, the Welsh Ministers must—
(a) **take all reasonable steps to maintain and enhance the living organisms and types of habitat included** in any list published under this section, and
(b) encourage others to take such steps
(5) In exercising their functions under this section, the Welsh Ministers must apply the principles of sustainable management of natural resources

[3] Section 7 list can be found here

[4] Wildlife and Countryside Act 1981 (as amended) – Section 28G

[5] Well-being of Future Generations (Wales) Act 2015 Section 3 and Section 4

environment with healthy functioning ecosystems *that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).”*

2. The design of the M4 CaN and choice of route and was drafted prior to the Well-being of Future Generations Environment (Wales) Act 2016 being brought into law. Therefore, the Welsh Government should have reviewed its proposals in the light of its commitments under this new Acts. It has failed to do so and as such the Welsh Government has not ensured it meets its own new legislative guidance as outlined in the Acts.

M4 CaN - CONSIDERATION OF PRIORITY SPECIES IN WALES

3. The Welsh Government has failed to comply with its duty under section 7 of the Environment (Wales) Act 2016. It has not taken all reasonable steps to maintain and enhance living organisms included on the list published under this section.

4. For example, the Welsh Government have failed to undertake specific species surveys in the area affected by the M4 CaN scheme for species on the list including:

    - **Harvest mouse** -recorded in the Magor Marsh area
    - **Polecat** - existing records in the vicinity including road kills
    - **Brown Hare –**existing records (see table
    - **Blood-vein (moth)** – recorded in TATA land
    - **Cinnabar (moth)** – Recorded on ABP land - docks
    - **Latticed Heath (moth)** –recorded on ABP land - docks
    - **Shaded Broad-bar (moth)** -recorded on ABP land -docks

5. The Welsh Government has subsequently failed to prepare any documents which outline the reasonable steps it plans to take to ‘maintain and enhance’ these living organisms which are known to be recorded in the vicinity of the M4 CaN.

6. We therefore put it to the Inquiry that the Welsh Government has not taken reasonable steps as required and it cannot be sure it will maintain and enhance those living organisms in respect for the M4 CaN scheme if it has not made any effort to find out the location of those species or the size and extent of those populations.

7. We have been working in tandem with the RSPB on a number of species matters and RSPB sent an email letter to Matthew Jones M4 Project Engineer dated 1st August 2016, requesting more information on matters of joint concern. A response letter was received dated 16th August 2016

8. The summary table received with this response states:

Species	**Further Information Required (refers to our request)**	**Status (WG response)**
Harvest mouse	No consideration to date. Specific survey required	No survey proposed nor raised by NRW at any time.
Polecat	No consideration to date. Specific survey required	No survey proposed nor raised by NRW at any time.
Invertebrates	Any further information to address the shortfall in the ES. This includes section 7 species: • Blood-vein moth • Cinnabar moth • Latticed Heath moth • Shaded broad-bar moth	We are not aware of any significant shortfall in the ES.

9. References to records of Section 7 list species in the M4 CaN documents are listed in th**is table:**

Species	**Survey completed for M4 CaN**	**References to species in M4 CaN documents**	**Specific surveys of population extent and mitigation statements for M4 CaN**
Brown hare	No	One reference to existing records in the corridor 10.4.216	None
Harvest Mouse	No	One reference to existing records in the corridor 10.4.216	None
Polecat	No	One reference to	None

		existing records in the corridor 10.4.215	
Shaded Broad-bar (moth)	Recorded on ABP land - Docks	Listed in appendix 10.31 terrestrial invertebrate survey 2015	None
Latticed Heath (moth)	Recorded on ABP land - Docks	Listed in appendix 10.31 terrestrial invertebrate survey 2015	None
Cinnabar	Recorded on ABP land - docks	Listed in appendix 10.31 terrestrial invertebrate survey 2015	None
Blood-vein (moth)	Recorded in TATA land	Listed in appendix 10.31 terrestrial invertebrate survey 2015	None
Unnamed species	Probably refers to one of the above invertebrates	Ecology chapter 10.4.489 no information given	?
Unnamed species	Probably refers to one of the above invertebrates	Ecology chapter 10.4.489 no information given	?

10. This shows the Welsh Government has failed to recognise, and not fulfilled, its responsibilities as required the Environment (Wales) Act 2016 e.g. its statutory duty towards Section 7 listed species in relation to the M4 CaN scheme.

SECTION 28 G OF THE WILDLIFE AND COUNTRYSIDE ACT 1981

11. As highlighted above, Section 28G of the Wildlife and Countryside Act 1981 places a duty on public authorities (including Ministers), in exercising their functions so far as this is likely to affect the flora, fauna or geological or physiographical features by reason of which a Site of Special Scientific Interest (SSSI) is of special interest, "*to take reasonable steps, consistent with the proper exercise of their functions, to further the conservation and enhancement of those features*".

12. The Gwent Levels is one of the largest surviving areas of ancient grazing marshes and reen (drainage ditch) systems in Britain. They have been present since Roman times. It is the largest and most important area of its kind in Wales, of acknowledged UK-wide significance for its wildlife.

13. The mitigation strategy proposed for the SSSI is significantly and fundamentally flawed. In very simple terms, you cannot lose 125ha of ancient SSSI habitat (including the loss of 2,755m of SSSI reens and 9,373m of SSSI field ditches which contain the SSSI insects) and at the same time conserve and enhance those SSSI features.

14. The Environmental Statement ("ES") highlights a number of mitigation measures, which include the creation of new reens to offset the loss of existing reens through construction. The new habitat would be provided just over a 1:1 ratio. However, the Environmental Statement

    - Gives no adequate indication the likely success of mitigation measures
    - Adduces no adequate evidence that the mitigation will be successful. Such evidence should take the form of detailed research in before, during and after studies into strategies on similar habitats and species to mitigate/compensate for the impacts of recently constructed roads on protected sites such as NNRs and SSSIs. Creating new reens to mitigate for the loss of biodiversity is equivalent to cutting down ancient woodland but planting new trees (which is also proposed – see Woodland Trusts Proof of Evidence). This results in a loss of ecological integrity.
    - States that some of the new reens will be located in areas of existing SSSI which already ecological rich.
    - Gives no valid explanation why a ratio of 1:1 replacement was chosen. The inherently large time lags, uncertainty, and risk of restoration failure require offset ratios that far exceed what is currently applied in practice.

15. The mitigation proposed for the impact on the Gwent Levels such as the replacement of reens shows a misunderstanding of the nature of the restoration ecology and the ecology of the reens. This mitigation and compensation is neither sufficient nor satisfactory. The Gwent Levels landscape is unique and the ecological communities within it are unique, complex, inter-related and perpetuated

by a long history of traditional management and are the product of adaptive evolution over hundreds, if not thousands, of years.

16. Therefore the Gwent Levels, by their very nature, cannot be recreated elsewhere, and if lost to development, will be lost forever. It is impossible, on the basis of the current state of scientific knowledge, to identify and package the raw materials involved and re-arrange them in a prescribed pattern to resemble the original. Nor can the same result be achieved naturally absent hundreds if not thousands of years of gradual progression.

17. Replacing ancient reens with freshly cut channels and claiming "a significant positive impact on biodiversity" is neither mitigation nor compensation. Restoration ecology is a relatively young scientific discipline and its effect in practical terms is very uncertain, with offsets rarely replacing the same biodiversity that is lost. Added to this, the success of mitigation measures which are implemented is rarely investigated and thus, the impacts of "mitigated schemes" are seldom certain.

18. English Nature Guidance on the impacts, mitigation and enhancement (Anderson, 1994[6]) states that habitat creation or translocation put forward for damage to SSSIs is totally unacceptable as mitigation unless it can be shown that the site can be recreated in full at minimum risk and within a short timespan. Such situations are only ever likely to occur on recently developed sites – therefore this cannot apply to the Gwent Levels. In most cases, the high value sites consist of long established habitats with great complexity, with small scale variation in plant and animal communities reflecting the underlying patterns of soils and ambient environmental factor. In many cases, the exact relationship between these factors, and the reasons for the complex, inter-related patterns found are not fully understood. It is impossible, therefore, to re-establish them.

19. Efforts to create new habitats do not compensate, nor usually provide, adequate mitigation for valued habitats, for example,

    - They lack historical context and continuity over time.

[6] *Penny Anderson (1994) – Roads and Nature Conservation: Guidance on the impacts, mitigation and enhancement – Produced for English Nature*

- There is usually an inability to provide undisturbed soils, unaffected by human development, and in a complex pattern reflecting drainage, topography etc
- The impossibility of re-establishing plant communities which match these small scale variations in soils and water relations
- The loss of plant diversity and richness compared with a high value site. Many plants are not available as seed, do not germinate readily from seed, or are not present in the seed bank. Few can colonise naturally subsequently.
- If plant communities are deficient, so will the animal populations. Habitat recreation is mostly dependant on animals reaching the new site unaided – some have poor powers of dispersal and cannot. Others will not find the desired habitat requirements, prey or symbiotic relationships. The complex inter-relationships between species will not be re-established and a more simple, less diverse ecosystem will result.
- It is usually impossible to mimic the hydrological requirements of damp or wet habitats.
- If habitat and species transferal is to be attempted– it will only move a proportion of the plants, the most sensitive, and those with the most demanding requirements, which are usually the rarest, tend to disappear. Only a small proportion of the animals / invertebrates are transferred and not all can recolonise. If part of the site is removed, both parts lose their ecological integrity and the reduced size of the resulting patches can result in reduced diversity and edge effects.

20. In relation to creating new SSSI habitat, these habitats are lacking in most of the aspects of biodiversity which confer high value to the site and furthermore, it is most unlikely to acquire it in the future. Therefore, neither habitat creation nor translocation provides adequate compensation or acceptable mitigation for the loss of all or part of high value sites.

21. *Curran et al 2014*[7] (see Annex 1) state that mitigation and compensation (or biodiversity offsets) are often seen as a policy mechanism to balance development and conservation goals. Many offset schemes employ habitat restoration in one area to recreate biodiversity value that is destroyed

[7] Curran et al (2014) Is there any empirical support for biodiversity offset policy?

elsewhere, assuming that recovery is timely and predictable. Recent research has challenged these assumptions on the grounds that restoration implies long time delays and a low certainty of success. Their results indicate that in the best case,

- species richness converges to old growth reference values within a century,
- assemblage composition up to an order of magnitude longer (hundreds to thousands of years).

22. Active restoration significantly accelerates the process for all indices, but the inherently
    - large time lags,
    - uncertainty,
    - and risk of restoration failure require offset ratios that far exceed what is currently applied in practice – such as the just over 1:1 ration employed by the M4 ES.
23. Restoration offset policy therefore leads to a net loss of biodiversity.

24. Another report by Suding (2011)[8] (see Annex 2), which looked systematically at mitigation projects worldwide, found that when restoration was being used to help the recovery of a degraded system, between two thirds and half were unsuccessful. When restoration aimed to generate new habitat, success rates were lower still.

25. Evidence from other studies[9] where such mitigation is more commonplace (US, Germany and Australia) also show that offsets in practical terms rarely achieve a similar ecological value to the site lost. Since biodiversity is dynamic, there are always risks that re-creation of such complex habitats will not achieve their intended aim – meaning they are a 'promise' rather than a certainty.

[8] Suding K.N (2011) 'Toward an era in restoration ecology: successes, failures and opportunities ahead' Annual Review of Ecology, Evolution, and Systematics 42:465-487.
[9] European Environmental Bureau – EEB Priorities for 'EU No Net Loss Initiative' http://www.eeb.org/EEB/?LinkServID=AE82914E-5056-B741-DB98744CF8393912&showMeta=0

Previous Mitigation on the Gwent Levels

26. We know from previous development on the Gwent Levels and attempts at reen mitigation that mitigation and compensation for development on the Gwent Levels does not work. For example, another development on the Gwent Levels (a Construction of Distribution Depot, Associated Trailer Parks and Car Parking for Europark) had similar mitigation and compensation plans drawn up. The Countryside Council for Wales (now Natural Resources Wales) approved plans to create new reens as mitigation for the watercourses to be lost through the development. These new features were supposed to help maintain the SSSI conservation interest. The Environmental Statement prepared by Chapman Warren for the Europark development stated:

    - 'The proposals would…….have no adverse effect on any interest of acknowledged importance'. (Section 11.2).
    - '…..while it is not possible to guarantee that the particular notable species presently found in Petty reen could be retained on the site in Petty Reen, or the compensatory reens, appropriate management would increase the chances that a high diversity of invertebrate species could be maintained on the development site'. (Section 6.25).

27. However, the post construction monitoring reports raise serious concerns about negative impacts on the nature conservation value of the SSSI resulting from the development. The 2nd Annual Report reaches the following conclusions:

    - All surveys conducted indicate a substantial impact on the reens as a result of the construction of the Tesco Distribution Centre.
    - The ecosystems affected displayed different rates of recovery, or no recovery at all
    - The aquatic invertebrate communities identified in the baseline survey have shown a continued decline throughout the survey period.
    - These loses in abundance and diversity must be as a result of construction works.

28. Another development involving the erection of 76,000 sq m distribution centre with parking, loading and offices, included fourteen mitigation conditions concerning habitat creation, site management to protect water courses and monitoring were attached to this application. However, monitoring reports produced by Hyder Consulting raised serious concerns about negative impacts, resulting from development, on the nature conservation value of the SSSI. The main issues are:

- The site has failed to recover from a large discharge of sulphate during the early stages of the development and from other sources, such as the lorry park, since then.
- High sulphate levels resulted in white and red algal blooms, and sulphur bacteria blooms in the reens on site.
- This in turn led to a reduction in the abundance and diversity of important invertebrate and plant species.
- High levels of other pollutants and poor water quality have also been recorded throughout the monitoring period.
- Further mitigation work, not considered necessary at the time of the application, was required in an attempt to deal with these issues.
- Sulphate levels in the balancing pond have stabilized at around 241 mg/l, far in excess of the 200 mg/l level deemed serious by CCW
- pH levels remain consistently high and in excess of acceptable levels
- Since development ceased floral diversity has improved marginally in some reens, while in others it has decreased further.
- Very few rare or notable plant species have been recorded since development began.
- Only 2 notable aquatic/semi aquatic invertebrate species were found on site at the end of the monitoring period. And amongst the semi aquatic invertebrates there has been a substantial decrease in diversity.

29. In both cases conditions, or a combination of conditions and a Section 106 {Land Use Planning} Agreement, designed to protect the nature conservation interest of this nationally important site have failed to achieve their objectives. At both sites significant losses in diversity and abundance of important

invertebrate and plant communities has resulted. At the end of the monitoring period neither site had recovered to anything like their pre-development nature conservation value.

CONCLUSION

30. It is of enormous concern that the proposed development of the motorway will have far larger effects on the environment than these two developments. The above demonstrates that the nationally important nature conservation value of the SSSI cannot be adequately safeguarded through mitigation or compensation strategies. Far too many variables exist in semi natural environments for all eventualities to be foreseen and adequately mitigated against.

31. If it cannot be ascertained that the proposal will not have an adverse effect on the integrity of the site (no reasonable scientific doubt remains) or the effects on integrity are uncertain but could be significant, permission should not be granted.

32. Therefore, the proposed construction of the M4 CaN motorway conflicts with statutory duties under the following enactments -

- Section 6 and 7 of the Environment (Wales) Act 2016
- Section 28G of the Wildlife and Countryside Act 1981
- Wellbeing of Future Generations (Wales) Act 2015

ANNEX 1 - IS THERE ANY EMPIRICAL SUPPORT FOR BIODIVERSITY OFFSET POLICY?

Ecological Applications, 24(4), 2014, pp. 617–632 2014 by the Ecological Society of America

Abstract. Biodiversity offsets are seen as a policy mechanism to balance development and conservation goals. Many offset schemes employ habitat restoration in one area to recreate biodiversity value that is destroyed elsewhere, assuming that recovery is timely and predictable. Recent research has challenged these assumptions on the grounds that restoration implies long time delays and a low certainty of success. To investigate these assertions, and to assess the strength of empirical support for offset policy, we used a meta-analytic approach to analyze data from 108 comparative studies of secondary growth (SG) and old-growth (OG) habitat (a total of 1228 SG sites and 716 OG reference sites). We extracted species checklists and calculated standardized response ratios for species richness, Fisher's alpha, Sorenson similarity, and Morisita-Horn similarity. We modeled diversity change with habitat age using generalized linear models and multi-model averaging, correcting for a number of potential explanatory variables. We tested whether (1) diversity of passively and actively restored habitat converges to OG values over time, (2) active restoration significantly accelerates this process, and (3) current offset policies are appropriate to the predicted uncertainties and time lags associated with restoration. **The results indicate that in the best case, species richness converges to OG reference values within a century, species similarity (Sorenson) takes about twice as long, and assemblage composition (Morisita-Horn) up to an order of magnitude longer (hundreds to thousands of years).** Active restoration significantly accelerates the process for all indices, **but the inherently large time lags, uncertainty, and risk of restoration failure require offset ratios that far exceed what is currently applied in practice**. **Restoration offset policy therefore leads to a net loss of biodiversity**, and represents an inappropriate use of the otherwise valuable tool of ecosystem restoration.

ANNEX 2 - TOWARD AN ERA OF RESTORATION IN ECOLOGY: SUCCESSES, FAILURES, AND OPPORTUNITIES AHEAD

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3.2. Restoration as Compensation for Habitat Loss

Biodiversity trading programs (which include biodiversity compensation, offsets, and biobanking) have proliferated internationally and are promoted by policy makers as facilitating both conservation and development. In this paradigm, restoration offsets the destruction of natural ecosystems. For instance, the wetland permit program established under the U.S. Clean Water Act allows wetland impacts to be offset through compensatory wetland mitigation (US Army Corps Eng. & EPA 2008). Although these policies operate under many assumptions that are similar to those in the recovery paradigm (see Section 3.1), planners face additional challenges relating to fair offset evaluation and spatial relocation.

In compensation, estimation of the likelihood of restoration success is essential because future gain is uncertain whereas the immediate loss is permanent (Moilanen et al. 2009). Even when the area restored is larger than the area lost, compensation seldom succeeds in restoring structure, composition, or function (Hilderbrand et al. 2005, Matthews & Endress 2008, Quigley & Harper 2006, Reiss et al. 2009, Tischew et al. 2010, Zedler & Callaway 1999). For instance, Reiss et al. (2009) assessed the success of 29 wetland mitigation banks in Florida. They found that 40% met permit criteria, whereas 17% were not close to compliance. In an assessment of 16 fish habitat compensation projects throughout Canada,which required reporting of fishery production, Quigley&Harper (2006) found that **63%of the sites experienced net losses in productivity whereas 12% achieved a net gain. Similarly, only a third of restoration goals were achieved in compensation projects to counteract impacts of road construction (Tischew et al. 2010).**

Given this uncertainty, how much habitat compensation is required to offset the loss of highquality habitat and result in no net loss? In biodiversity trading policy, this difference is often referred to as an offset ratio (Moilanen et al. 2009) and in many ways reflects a quantification

(albeit often debatable) of anticipated restoration success. For instance, Quigley & Harper (2006) **report that although policy required offset ratios to be on average approximately 7:1 (area gained to area lost), the mean offset ratio actually implemented was 1.5:1, which resulted in only 6 out of 16 cases reaching no net loss in terms of habitat productivity**. In dry grasslands in Switzerland, Dalang & Hersperger (2010) estimate offset ratios that approach 200 in some cases, certainly not a viable conservation option. Moreover, in some cases, policy expectations may go beyond the capability of science. For instance, the 2008 revision of the U.S. Clean Water Act includes the creation of new stream habitats, a largely uncertain endeavor (Stokstad 2008).

Spatial connectivity and temporal lags are other critical issues in habitat compensation. To maintain regional biodiversity, trading programs must replace ecological interactions and functions lost in development. A common pattern is to replace small focal systems lost in urban areas with aggregated ones in more rural areas (BenDor et al. 2009), although we know little about spatial dependencies and how they vary among different ecosystem components (e.g., biogeochemistry versus avian population structure). **In addition, restorations take time to provide the same functions that established habitats provide; the lag between habitat loss and creation can substantially affect population viability (Maron et al. 2010).**