
**PROOF OF EVIDENCE OF
PROFESSOR SIR JOHN LAWTON CBE FRS**

ON BEHALF OF

GWENT WILDLIFE TRUST

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: a summary of the scientific
principles underpinning effective conservation**

February 2017

INTRODUCTION

1. I am Professor Sir John Lawton. I became President of the Institution of Environmental Sciences in April 2015, having been appointed an Honorary Fellow in 2011. I am a recognised authority on ecology, and am currently Vice President of the RSPB, President of the Yorkshire Wildlife Trust and a Life Fellow of WWF-UK. I attach as **Appendix 1** to this proof of evidence a short curriculum vitae.
2. By way of summary, in 1989 I was elected a Fellow of the Royal Society, and was knighted in 2005 for my contributions to ecological science. Throughout my career I have held a number of roles, including Chief Executive of the Natural Environment Research Council (NERC) for 6 years and Chairman of the Royal Commission on Environmental Pollution from 2005 until its closure in 2011. My particular interests have revolved around population dynamics and biodiversity of birds and insects. In 1989 I founded the NERC Centre for Population Biology at Imperial College London. I have played a major part in promoting UK-wide wildlife conservation, leading the 'Lawton Review' of the resilience and adequacy of England's wildlife sites. The review's report, **Making Space for Nature**¹, was published in 2010. Concluding that England's ecological network is too small and isolated, the review called for better protection of England's wildlife and the establishment of new Ecological Restoration Zones. This was widely supported, with the establishment in 2011 of Nature Improvement Areas², and the report continues to inform policy today.
3. Over the last decade, I have been particularly interested in the impacts of environmental change on ecosystems worldwide. I have published over 320 scientific papers throughout my career, and in 2011 I was awarded the RSPB medal for my contributions to wild bird protection and countryside conservation.

¹ Professor Sir John Lawton (2010) - **Making Space for Nature** - Making Space for Nature: A review of England's Wildlife Sites and Ecological Network - Submitted to the Secretary of State, the Department for Environment, Food and Rural Affairs on 16 September 2010
<http://webarchive.nationalarchives.gov.uk/20130402151656/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>

² Nature Improvement Areas: about the programme <https://www.gov.uk/government/publications/nature-improvement-areas-improved-ecological-networks/nature-improvement-areas-about-the-programme>

EVIDENCE

4. Conservation science is underpinned by well-established ecological principles, which strongly support the view that if the proposed M4 extension across the Gwent Levels goes ahead, it will severely damage one of Wales's (indeed the UK's and Europe's) most important wildlife sites, and that the damage is very unlikely to be prevented by proposed mitigation measures.
5. The Gwent Wildlife Trust has provided the Inquiry with a very detailed description of the impacts of the proposed M4 extension (specifically, the M4 Corridor around Newport (M4CaN) Scheme). In summary the impacts include:

- The loss of 125ha of Site of Special Scientific Interest ("SSSI") habitats.
- Permanent damage to 9 Sites of Importance for Nature Conservation ("SINC").
- The permanent loss of a section of their Magor Marsh Nature Reserve.
- The loss of 2,755m of SSSI reens and 9,373m of field ditches.

The consequence of these impacts includes threats to a whole range of species of conservation concern, including European protected species.

6. The evidence put forward by the Gwent Wildlife Trust is underpinned by an extremely robust body of conservation and ecological science.

SUMMARY

7. In summary, my view is that the effect of the proposed M4 extension will be to destroy and fragment large areas of designated SSSI and SNIC habitat and significantly to damage population numbers of a number of vulnerable species, including European protected species. The effect of population reduction is to make those populations more vulnerable to local extinction as a result of inevitable shocks. Fragmentation reduces or eliminates the potential for dispersal and re-colonisation, 'devaluing' remaining habitat and ultimately resulting in a greater

risk of the regional extinction of some species. Despite this, the measures proposed to mitigate the effect of the proposed M4 extension are unlikely to be effective. They are of scientifically unproven, and in some cases appear impossible. The scheme is therefore likely to have a significant and adverse ecological impact.

THE LAWTON REPORT

8. In 2010 I produced a report for the Department for Environment, Food and Rural Affairs (“DEFRA”) (Lawton *et al.* 2010. *Making Space for Nature: a review of England’s wildlife sites and ecological network*)³. In 2009, DEFRA had asked me to chair a working group to advise on whether England’s wildlife sites comprise “a coherent and resilient ecological network”. *Making Space for Nature* was the outcome.
9. That report subsequently formed a major part of the Westminster Government’s White Paper *The Natural Choice: securing the value of nature* (CM8082, 2011)⁴. The fact that it referred only to England is not material. The science underpinning the Lawton Report applies to ecosystems anywhere in the world, including Wales.
10. The report concluded that despite individual conservation successes, the overall picture for the conservation of nature in England was gloomy, with continuing loss of many species and habitats, even in protected areas. There has been no overall improvement during the intervening six years, with more than one in ten UK species now threatened with extinction (*State of Nature 2016 report*)⁵.
11. The reasons for this continuing loss of species and habitats are evident. Most pertinent to the present enquiry is the direct loss of wildlife habitats, which can eliminate species from an area altogether, or at the very least reduce the size of surviving populations.

³ See footnote 1

⁴ The Natural Choice: securing the value of nature
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf

⁵ State of Nature Report (2016) <http://www.wtwales.org/wildlife/state-nature-2016>

Fragmentation and Reduced Population Size

12. Smaller populations are less able to withstand inevitable 'shocks' (a hard winter, or a fire, for example), and as a result are more likely to die out, even in surviving fragments of suitable habitat. Fragmentation and isolation of habitat patches means that many species are also unable to disperse naturally across hostile environments (arable fields, a motorway, urban areas etc.) to recolonise suitable habitat patches, reducing the long-term viability of so called "meta-populations", which can lead, eventually, to regional extinction, even if suitable habitat still survives.
13. The effects of these two problems (fragmentation and population reduction) are exacerbated by poor habitat management of existing wildlife sites. This further reduces population sizes, and increases the risks of local extinction. (See the Lawton Report 2010; and many ecological and conservation text-books⁶.)

Remedies

14. The Lawton Report made a number of recommendations designed to halt and eventually to remedy of these serious problems. In simple, headline terms what is needed are "more, bigger, better and joined up" wildlife sites. We need more protected sites; bigger sites; better managed sites; and sites that are connected either by corridors or 'stepping stones' of suitable habitat.
15. With trends all in the 'wrong' direction across many parts of the UK, we will inevitably continue to lose our wildlife. It is true that the effects are not the same upon all wildlife; some species can and are doing well in a hostile UK environment, but there are far more losers than winners. Amongst the most vulnerable species are some of the Gwent Levels' specialities – Dormouse, Water Vole, Hedgehog, Barn Owl and several species of wintering birds, for instance.
16. One of the key recommendations of the Lawton Report was that Defra should establish a national (England-wide) competition to establish twelve voluntary Nature Improvement Areas

⁶ For example, Lindenmayer, D., and Burgman, M. 2005. Practical Conservation Biology. CSIRO Publishing; 609pp.). <https://www.cabdirect.org/cabdirect/abstract/20063045222>

(NIAs) (see *The Natural Choice*). I chaired the panel that awarded NIA status to 12 successful bids (from a total of 76 bids). The modal size of each NIA is about 50km² made up of 'working' countryside (agriculture, forestry, wetlands and so on), one major urban NIA, and sites important for nature-conservation. The whole point of the NIAs is to increase the land in sympathetic management for nature conservation, without detracting from major existing patterns of land-use, using seed-corn funding from Westminster and additional money raised by each NIA from a variety of sources. Work started on the NIAs in April 2012, and Government funding ceased in 2015; all 12 NIAs are still doing "more, bigger, better and joined" nature conservation very successfully. The project is working; all the NIAs have delivered significant benefits for wildlife, some remarkably quickly, exactly as the underpinning science predicts should be the case.

THE IMPACT OF THE M4CaN SCHEME

17. The proposed M4CaN Scheme is designed to do the exact opposite of the NIAs, namely "less, smaller, worse and fragmented"; less habitat designated as SSSI or SINCR, resulting in smaller areas surviving for nature conservation; potentially deteriorating habitat conditions (through alteration of drainage patterns, or pollution for instance) in surviving habitat patches; and increased isolation of sites cut through by the road and associated infrastructure. There is bound to be a negative impact on a wide range of protected species, exactly as Gwent Wildlife Trust has stated (though without very detailed studies, which do not appear to have been done, exactly how many, and which, species, I cannot say with certainty).
18. In particular I wish to express agreement with the professional assessments of colleagues (for example Professor Altringham) that the so-called 'mitigation measures' proposed by those promoting this scheme are unlikely to be effective. Many of the measures proposed are of unproven viability, and in some cases even appear impossible; they will not, in my opinion, significantly reduce the detrimental impacts on wildlife that will inevitably follow if this scheme goes ahead.
19. The Gwent Levels is one of the largest surviving areas of ancient grazing marshes and reed systems in the UK, and the largest in Wales. It is a jewel in the crown of Welsh wildlife

conservation. Unsurprisingly, it has a very high level of protection, both statutory and through the planning system. So I am absolutely baffled by the Welsh Government proposals to destroy and heavily modify parts of the area, in direct contravention of;

- section 6 (1) Environment (Wales) Act 2016,
- the Resilient Wales goal of the Well-being of Future Generations (Wales) Act 2015,
- the Wildlife and Countryside Act 1981 (as amended)

20. Without wishing to sound hyperbolic, the gravity of the effects of the proposal should not be underestimated. In matters such as this, it sometimes helps to stand back from the detailed facts of the case and to use an analogy. I ask the Welsh Government whether they would countenance building a highway through 'just' a small part of St David's Cathedral, mitigated by minor aesthetic improvements to the highway? This would be vandalism on a scale beyond contemplation. The Gwent Levels are a cathedral of nature conservation and deserve equal protection.

APPENDIX 1

SIR JOHN LAWTON: CURRICULUM VITAE

Career and Positions Held

- Department of Zoology, University of Durham: 1st Class Honours Degree (1965); PhD (1969).
- Demonstrator in Animal Ecology, Department of Zoology, Oxford University (1968-71).
- Lecturer, University of York (1971-78); Senior Lecturer (1978-82); Reader (1982-85); Professor (personal chair) (1985-89).
- Director, NERC Centre for Population Biology and Professor of Community Ecology, Imperial College of Science, Technology and Medicine, London (1989-99).
- Chief Executive, Natural Environment Research Council (1999- 2005).
- Chairman, Royal Commission on Environmental Pollution (2005-11).

Honorary and Adjunct Positions

- Honorary Visiting Research Fellow, Natural History Museum, London (1990-2005).
- Adjunct Scientist, Institute of Ecosystem Studies, New York (1992-2000).
- Fellow of Institute of Arable Crops Research, Rothamsted (1998-2000).
- Honorary Visiting Professor, University of York (1998-2015).
- Honorary Visiting Professor, Imperial College, Silwood Park (1999-).

Selected Honours and Prizes

- Elected Fellow of the Royal Society of London for my work on ecology and conservation (1989).
- CBE in The Queen's Birthday Honours List for services to ecological science (1997).
- KBE (Knighted) in the New Year Honours list (2005).
- Foreign Associate of US National Academy of Science (2008).
- Foreign Honorary Member of American Academy of Arts and Sciences (2008).
- Japan Prize, Science and Technology for Conservation of Biodiversity (2004).

- President's Gold Medal of the British Ecological Society (1987).
- Kempe Award for Distinguished Ecologists, Sweden (1998).
- Zoological Society of London Frink Medal (1998).
- Honorary Life Member, Royal Entomological Society (2001).
- Society for Conservation Biology La Roe Award (2002).
- Ramon Margalef Prize in Ecology and Environmental Science, Catalonia (2006).
- Honorary Fellow of the Zoological Society of London (2007).
- Fellow of WF-UK (2008).
- Honorary Member of the British Ecological Society (2009).
- The RSPB Medal for outstanding achievements in wild bird protection and countryside conservation (2011).
- Patron, Chartered Institute of Ecology and Environmental Management (2011).

Selected Professional-Related Activities

- Vice President, British Trust for Ornithology (1999-2007).
- President British Ecological Society (2005-07).
- Chairman, RSPB Council (1993-'98); Vice President (1999-).
- Trustee, Yorkshire Wildlife Trust (2007-09); Chairman (2009-14); President (2014-).
- Chairman for Defra of *Making Space for Nature* (the "Lawton Report") (2010-11); Chairman of the subsequent *Nature Improvement Areas* competition (2011-12) for Westminster Government.