

Impact case study (REF3)

Institution: University of Northampton		
Unit of Assessment: 14 - Geography and Environmental Studies		
Title of case study: Shaping the Nene Valley Nature Improvement Area (NIA): conserving ecosystems, engaging communities, and transforming infrastructure planning		
Period when the underpinning research was undertaken: 2000 to 2015		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Jeff Ollerton	Professor	2005 – October 2020
Janet Jackson	Senior Lecturer	2005 – present
Duncan McCollin	Associate Professor	2005 – October 2020
Period when the claimed impact occurred: 2012 to 2020		
Is this case study continued from a case study submitted in 2014? N		

1. Summary of the impact

The Nene Valley Nature Improvement Area (NIA) is one of twelve flagship nature conservation initiatives designated by the United Kingdom (UK) Government in 2012. Research by **Professor Ollerton, Dr McCollin** and **Dr Jackson** was instrumental in shaping the NIA's development. From the NIA's inception, **Ollerton, McCollin** and **Jackson** have collaborated with local government, NGOs such as the Wildlife Trust and the RSPB, businesses, and the regional community to foster and monitor/map environmental, social and policy impacts. The research has:

- Led to enhancement/restoration of diverse habitats and ecosystem services across a 41,350ha area;
- Facilitated new models of community/intersectoral engagement with ecosystem services;
- Constituted a step change in regional policy-making and green infrastructure planning.

2. Underpinning research

NIA status was awarded through a competitive process to support major, innovative evidence-led collaborations between policymakers, local communities, conservation organisations, landowners and HEIs. As partners **Ollerton, McCollin** and **Jackson** directly contributed to the formative evidence review which shaped the vision for NIA. Specifically, plans for the Nene Valley NIA were directly underpinned by externally funded research including:

- **Ollerton and McCollin's** assessment of the value of ecologically restored landfill sites for supporting bird, plant and pollinator communities, which included advice to the wastes management industry on how to improve landscape restoration **[3.1,3.2, funded by SITA Environmental Trust]**.
- **McCollin and Jackson's** Natural Environment Research Council (NERC) funded assessments of changing plant diversity in floristically rich cultural landscapes in the UK over the past two centuries **[3.3]**, and the role of hedgerows in maintaining ancient woodland plant populations **[3.4]**.

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- **Ollerton** and **Jackson's** detailed UK case studies of how green infrastructure in urban environments support pollinating bee populations [3.5], and **Jackson's** Local Authority-funded analyses of the value of floodplain habitat restoration for increasing local community environmental awareness and engagement [3.6].

Building on the interdisciplinary work **Ollerton**, **McCollin** and **Jackson** designed, managed and supported a work package within the Nene Valley NIA programme focused on assessing, mapping and valuing the region's natural capital and ecosystem services. This entailed three lines of activity:

Mapping biodiversity and ecosystem assets. Working with a post-doctoral Research Assistant the team developed a process for mapping the Nene Valley's natural capital assets, incorporating diverse multimodal data sources (e.g. aerial photographs, archival sources, and 275,000 biological records held by diverse local and regional organisations regarding six taxonomic groups) into an interactive GIS map [5.1, 5.2.1, 5.2.2]. The mapping exercise evidenced marked historic shifts in habitats (particularly a steep decline in natural grasslands) since the 1930s, whilst also constituting an unprecedented baseline listing of the region's 10,000km of hedgerows and tree-lines.

Developing public engagement and understanding of ecosystem services. The team worked to trial and optimise modes of public engagement and understanding around the ecosystem mapping. For example, **Ollerton** and **Jackson** developed and contributed to a series of community panels and consultations around key sites, issues and ecosystem services in the region. This process evidenced the significant degree of local, community knowledge in relation to ecosystems and modelled ways in which this local knowledge can be harnessed by policymakers, planners and academic partners in conservation projects.

Modelling monetary value of natural capital. The research assistant worked with **Ollerton** and **Jackson's** direction to apply and adapt the Wildlife Trust's EcoServ GIS toolkit to map densities of, and demand for, ecosystem services and model the monetary value of a range of diverse forms of natural capital. This process evidenced the substantial importance of urban areas as sites of, and drivers of demand for, contemporary ecosystem services. The analysis also quantified, for the first time, the monetary value of ecosystem services in the Nene Valley NIA at GBP109,000,000 (GBP2,639 per ha per year) with the majority of this value directly linked to recreational usage of ecosystem services.

3. References to the research

[3.1] Rahman, M. L., Tarrant, S., **McCollin, D.**, & **Ollerton, J.** (2011). The conservation value of restored landfill sites in the East Midlands, UK for supporting bird communities. *Biodiversity and Conservation*, 20(9). <https://doi.org/10.1007/s10531-011-0064-6>

[3.2] Tarrant, S., **Ollerton, J.**, Rahman, M. L., Tarrant, J., & **McCollin, D.** (2013). Grassland restoration on landfill sites in the East Midlands, United Kingdom: an evaluation of floral resources and pollinating insects. *Restoration Ecology*, 21(5), 560-568. <https://doi.org/10.1111/j.1526-100X.2012.00942.x>

[3.3] **McCollin, D.**, Moore, L., & Sparks, T. (2000). The flora of a cultural landscape: Environmental determinants of change revealed using archival sources. In *Biological Conservation* (pp. 249-263). (Biological Conservation; Vol. 92). [https://doi.org/10.1016/S0006-3207\(99\)00070-1](https://doi.org/10.1016/S0006-3207(99)00070-1)

[3.4] **McCollin, D.**, **Jackson, J. I.**, Bunce, R. G. H., Barr, C. J., & Stuart, R. (2000). Hedgerows as habitat for woodland plants. *Journal of Environmental Management*, 60(1), 77-90. <https://doi.org/10.1006/jema.2000.0363>

[3.5] Sirohi, M., Jackson, J., Edwards, M., & Ollerton, J. (2015). Diversity and abundance of solitary and primitively eusocial bees in an urban centre: a case study from Northampton (England). *Journal of Insect Conservation*, 19(3), 487-500. <https://doi.org/10.1007/s10841-015-9769-2>

[3.6] Kwolek, A. V. A., & Jackson, J. I. (2001). Floodplains and Agenda 21: the Upper Nene Valley Project. *Sustainable Development*, 9(3), 165-174. <https://doi.org/10.1002/sd.158>

4. Details of the impact

The NIA was designed to co-develop research led impacts with Wildlife Trusts, community groups, and policymakers in the Nene Valley. As the NIA was explicitly developed to foster sustainable, long-term impacts, all impact has continued and accelerated after the initial NIA funding period of 2012-15. The GBP3,300,000 invested into the Nene Valley NIA over the initial three-year programme created seven jobs across four organisations, as well as grant-funded contract work, which were sustained after the initial funding period [5.1, 5.3]. In particular, sustained work with NIA partners has enabled Ollerton, Jackson and McCollin to play leading roles in three key lines of impact:

Conserving and restoring ecosystems. A key focus of all NIAs was to support landscape-scale interventions to enhance and restore diverse and threatened habitats. Ollerton, Jackson and McCollin [3.1, 3.2, 3.3, 3.4, 3.5, 3.6] evidenced specific needs in relation to pollinators, flora, hedgerows and urban waterways and green infrastructures. This evidence directly shaped investment priorities within the NIA, which supported major new conservation initiatives that explicitly focused on, and sought to address, issues raised in the team's underpinning research. The needs analysis undertaken in relation to pollinators, flora and hedgerows directly influenced programmatic work by the NIA to develop relationships with farmers and landowners to facilitate the creation and restoration of 115ha of wildflower meadow [5.1], and a total of 1,500ha of land being brought into new Higher Level Stewardship (HLS) arrangements with agreed principles for grassland, fen and floodplain restoration to date as a result of the NIA [5.3]. Similarly, the needs analysis around urban waterways underpinned the NIA's targeted support for river 'greening' interventions which have subsequently led to 350 local projects to improve water quality and river habitats across the NIA region [5.4]. The efficacy and lasting impacts of these ecosystem restoration schemes for wildlife and communities has been recognised by subsequent awards of EU Special Protection Area and UN Ramsar designations for several restored sites, demonstrating their continuing significance for over-wintering birds [5.1, 5.4].

Developing community/intersectoral engagements with ecosystem services. From the outset, the NIA was designed to foster new modes of community engagement and sustained multidisciplinary practice around ecosystem services. Ollerton and Jackson have worked to lead and sustain a range of community consultations and voluntary activities around key evidence, sites and issues which were central to the NIA. For example, they led a series of 'community panels' – set up with support from Sciencewise, a UK Government funded programme that helps inform science and technology-based policy decisions through public dialogue – bringing together diverse community members to discuss legacies and next steps following the NIA. The panels demonstrated 'a very high standard' of debate and directly led to action plans and recommendations for appropriate management activities and increasing public access, for the Upper Nene Valley Gravel Pits Special Protection Area/Ramsar site [5.1]. In addition, local community members have continued to be involved in volunteering activities – particularly around ecosystem restoration and management – underpinned by the team's research on flora and waterways. Community members have recorded more than 63,000 hours of time towards the restoration of habitats and ongoing mapping of the area [5.1, 5.3]. Ollerton, Jackson and McCollin have directly supported the continuing work of the NIA working group in sustaining intersectoral engagement which included land advisors, conservation organisations and farmers. This has played a key role 'in prioritising and coordinating advisory and support

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services to farmers in the Nene Valley'. The team's work in evidencing and monitoring impacts of the NIA has actively facilitated farmers entering Environmental Stewardship schemes, increasing the number of farmers participating in Higher Level Stewardship (HLS); thus, the amount of land under HLS rose by 5,750ha across the wider project area (NIA plus 3km buffer) [5.3].

Embedding 'green infrastructure' planning in regional and national decision-making.

Testimonials from a range of key stakeholders in the Nene Valley NIA indicate that the most significant and lasting impact of **Ollerton, Jackson** and **McCollin's** work has been the evidence-based embedding of 'green infrastructure' as a policy/planning tool in relation to ecosystem services, regionally and nationally. For example, the team's application of ecosystem mapping and community engagement to foster 'green infrastructure' planning is specifically highlighted as 'one of the most innovative areas of the Nene Valley NIA' [5.5.1], 'now play[ing] a key role in environmental decisions across [Northamptonshire]' [5.5.2], but also of national significance [5.5.3]. For one Local Authority Flood & Water Manager, the team's key contribution has been to create a new approach and evidence which has transformed the practice of policy-makers and planners, by making a, "significant input into the development of a methodology for Ecosystem Services and Natural Capital mapping and valuation across the Nene Valley and tributaries...I have been able to see first-hand the impact that this work has had both locally and across the Ox-Cam [Oxford-Cambridge] Arc. This has helped provide an evidence base for habitat creation across Northamptonshire and Peterborough and supported in securing funding to undertake further work in this arena." [5.5.3].

The biodiversity maps and ecosystem services datasets created through the research are being actively used by diverse Local Authorities to understand the connections between biodiversity and ecosystem services. The team's ecosystem mapping and valuation process has been explicitly embedded in a series of regional planning policies that will guide infrastructural and ecosystem development in the Nene Valley region over the next two decades [5.1, 5.5.3, 5.5.2]. For example, the NIA research led directly to **Jackson** being commissioned to co-develop a new 'Green Infrastructure Plan' in partnership with Northampton Borough Council, Fiona Fyfe Associates Ltd, and CountryScape. Methods and outputs from the NIA work were applied to create an interactive map of ecosystem services and a series of evidence-based policy commitments to be consulted in all planning, development and infrastructure policy for the next two decades [5.6.1, 5.6.2]. The Plan forms a required, evidence-based point of reference for all developers submitting planning applications within Northampton and gives examples of projects demonstrating best practice for investment in green infrastructure [5.6.1]. An online interactive map identifies areas of green infrastructure in Northampton and allows residents to comment [5.6.2].

The value of the underpinning 'green infrastructure' approach has been recognised in the Northampton Green Infrastructure Plan's shortlisting for a 2018 Royal Town Planning Institute (RTPI) award, and in its widespread adoption in planning policy frameworks, regionally and nationally. For example, the team's research has been used as the baseline and approach in major regional infrastructure plans in North [5.5.3, 5.7.1] and West Northamptonshire [5.7.2], in the planning of large-scale new residential 'garden village' developments across the NIA region [5.5.3], and in the strategic redevelopment of Local Nature Partnership areas, including Buckinghamshire, Bedfordshire and Cambridgeshire [5.5.3]. More widely, the team's approach to mapping ecosystem services and green infrastructures has explicitly shaped the development of regional planning guidance issued by diverse Local Authorities including those in Greater Manchester, Rutland, Teesside [5.7.3, 5.7.4] and technical guidance issued through the auspices of the Environment Agency [5.8], Scottish Natural Heritage [5.7.5] and the Parliamentary Office of Science and Technology [5.9].

5. Sources to corroborate the impact

[5.1] NIA final report <https://www.wildlifebcn.org/sites/default/files/2019-01/Nene-Valley-A4-16PP-MAR-2015-web.pdf>

[5.2] [Natural Capital Solutions](#)

[5.2.1] Rouquette, J.R. (2016). Mapping Natural Capital and Ecosystem Services in the Nene Valley <http://www.naturalcapitalsolutions.co.uk/wp-content/uploads/2017/01/Mapping-natural-capital-ecosystem-services-in-the-Nene-Valley.pdf>

[5.2.2] Letter from Dr Jim Rouquette

[5.3] Nene Valley NIA Monitoring and Evaluation report 2012-15, Years 1-3

<https://www.wildlifebcn.org/sites/default/files/2019-01/Final%20Nene%20Valley%20M%26E%20Report%202012%2015.pdf>

[5.4] Natural England (2016) Nature Improvement Areas Programme: Case Studies,

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/487239/nia-case-studies.pdf

[5.5] Letters of support from individuals representing key partners within Northamptonshire:

[5.5.1] Letter from Chair of Nene Valley NIA Project Board

[5.5.2] Letter from Deputy Chief Executive of Daventry District Council and former Chair of Northamptonshire Local Nature Partnership

[5.5.3] Letter from Flood and Water Manager for Northamptonshire County Council

[5.6] [Northampton Green Infrastructure Plan](#)

[5.6.1] Northampton Borough Website:

<https://www.northampton.gov.uk/info/200205/planning-for-the-future/2049/green-infrastructure-in-northampton>

[5.6.2] <http://mapping.northampton.gov.uk/>

[5.7] NIA data/methods as key guidance in other Local Authority/planning contexts

[5.7.1] North Northants Green Infrastructure Delivery Plan

<http://www.nnjpu.org.uk/docs/7. Appendix 1 full GDP June 2014.pdf>

[5.7.2] West Northants Joint Core Strategy :

https://westnorthantsplan.inconsult.uk/corestrategy_2011/viewCompoundDoc?docid=708116&sessionid=&voteid=&partId=728532

[5.7.3] Greater Manchester Infrastructure Framework 2040:

<https://www.greatermanchester-ca.gov.uk/media/1715/greater-manchester-infrastructure-framework-2040.pdf>

[5.7.4] Tees Valley Green Infrastructure Strategy:

https://www.middlesbrough.gov.uk/sites/default/files/PlanLib-TV_Green_Infrastructure_Strategy.pdf

[5.7.5] A Toolkit for Mapping Ecosystem Services

[https://www.nature.scot/sites/default/files/2018-06/Publication%202018%20-%20SNH%20Research%20Report%20954%20-%20EcoServ-GIS%20v.3.3%20A%20toolkit%20for%20mapping%20ecosystem%20services%20\(GB%20scale\).pdf](https://www.nature.scot/sites/default/files/2018-06/Publication%202018%20-%20SNH%20Research%20Report%20954%20-%20EcoServ-GIS%20v.3.3%20A%20toolkit%20for%20mapping%20ecosystem%20services%20(GB%20scale).pdf)

[5.8] Anglian River Basin District River Basin Management Plan

<https://www.gov.uk/government/publications/anglian-river-basin-district-river-basin-management-plan>)

[5.9] UK Parliament Post (2019) Net Gain

<https://researchbriefings.files.parliament.uk/documents/POST-PB-0034/POST-PB-0034.pdf>