Sustainable Landscapes: Maintaining biodiversity conservation and ecosystem service delivery

An investigation of the design, implementation and management of NIAs and their potential impact on England’s ecological network

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Declaration of Ownership

I, Marie L. Longnecker, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Marie L. Longnecker
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Abstract

Protected areas, designations and landscapes form an important part of the global initiative to conserve wild nature. Designated landscapes aim to facilitate robust ecological networks, which operate across scales and contribute to maintaining a coherent and functional suite of sites for wild nature, both now and into the future. However, concerns about the effectiveness of landscape-scale initiatives are increasing, particularly in light of the multiple demands made from such spaces with regard to both conservation of wild nature and ecosystem service benefits. Conservation is a political process, and many factors influence the potential success of these spaces in maintaining ecosystems, from the establishment of such areas to the management strategies employed.

I consider a recent conservation initiative in England called the Nature Improvement Area (NIA) Initiative. The program envisioned forming “joined-up and resilient ecological networks at a landscape scale” (CEP, 2014a) in addition to delivering “win-win opportunities” (CEP, 2014a) that provided for multiple benefits for two key objectives of wild nature conservation and ecosystem service delivery. This research investigates the social-ecological processes of the design, implementation and management of the NIA Initiative in the first three years from 2012 to 2015 employing both quantitative and qualitative data and analyses. In order to provide scope to the topic, the research is focused in four ways: firstly, the design of the NIA Initiative and whether it fulfils the Lawton Report’s (Lawton et al, 2010) original vision for the program. Secondly, the implementation of the Initiative and its success or otherwise in achieving its stated objectives throughout the three-year process. Thirdly, the thesis considers the outcomes of the Initiative and explores the results in light of those presented in the 2015 Final Monitoring and Evaluation Report (CEP, 2015a). Finally, it makes recommendations for future landscape programs.
Impact Statement

The landscape approach is acknowledged as an important means for realising the Aichi targets of the UN Convention on Biological Diversity and is frequently recognised as important in working towards coherent and resilient landscapes in the face of climate change. Landscapes in particular are emphasised in the shift towards sustainability, acknowledging the multiple demands that must be made from these areas, identified broadly as wild nature conservation and the delivery of services on which humans depend. The Nature Improvement Area (NIA) Initiative was a landscape-scale program overseen by government bodies and made up of 12 individual areas that ran from 2012 to 2015 across England with the ultimate goal of achieving progress towards a step-change in the current approach to conservation. This step-change is defined as a shift from purely focusing on preserving what currently exists to one which focuses on broad-scale ecosystem restoration and recreation based on the restoration of ecological patterns and processes and associated ecosystem services and which benefits both wild nature and society. This work examines the design, implementation and management of the NIA Initiative using both quantitative, GIS-based analyses and qualitative, interview-based methodologies and explores its success or otherwise in achieving biodiversity conservation, improved ecosystem service delivery and community engagement at both the national and local levels. It makes unique contributions to the research area and to policy through the following:

• Illustrating the value of local context in the effective implementation and management of a conservation initiative;
• Discussing the importance of the consideration of synergies and trade-offs between objectives in all aspects of design, implementation and management of a landscape-scale conservation initiative;
• Emphasising the importance of scale by providing an examination of local and national perspectives in landscape management effectiveness;
• Providing recommendations for improvements to future landscape-scale programs; and,
• Enhancing understanding of landscape management effectiveness through the incorporation of features specific to landscape-scale initiatives.

The outcomes will be (and, in fact, have been) communicated through academic conferences to facilitate knowledge transfer and exchange. It will be further disseminated through sustained engagement with policy professionals, particularly
those involved with environmental land management at Defra and stewardship schemes at Natural England where it will continue to help to inform the design and implementation of future landscape-scale programs in England.
Table of Contents

Declaration of Ownership ..................................................................................................... 2
Acknowledgements ............................................................................................................... 3
Abstract ................................................................................................................................... 4
Impact Statement .................................................................................................................. 5
List of Figures ...................................................................................................................... 12
List of Tables ........................................................................................................................ 14
Acronyms .............................................................................................................................. 15

1 Introduction ................................................................................................................ 16
   1.1 Background and context: Landscape management ..................................................... 16
   1.2 Sustainable Landscapes: the multiple objectives of biodiversity conservation and ecosystem service delivery ................................................................. 17
   1.3 Conservation in England: England’s ecological network ............................................ 18
   1.4 The landscape approach: the NIA Initiative ................................................................. 19
   1.5 Management effectiveness: the IUCN framework ..................................................... 20
   1.6 Identifying the knowledge gaps: the NIA Monitoring and Evaluation Reports 20
   1.7 Research objectives and design ................................................................................. 23
   1.8 Unique contributions of the research ........................................................................ 25
   1.9 Structure of the thesis ............................................................................................... 26

2 Literature Review ............................................................................................................ 29
   2.1 Defining and framing landscape management ............................................................ 30
      2.1.1 Defining biodiversity ........................................................................................... 31
      2.1.2 Defining and framing ecosystem services ............................................................ 32
      2.1.3 Sustainable landscapes ...................................................................................... 34
      2.1.4 Managing for multiple objectives: synergies and trade-offs.............................. 36
   2.2 The ecological network: space for nature ................................................................. 39
      2.2.1 Defining ecological networks .............................................................................. 39
      2.2.2 Protected areas and designations in England ...................................................... 43
      2.2.3 The impacts of scale: landscape-scale initiatives ................................................. 45
      2.2.3 The Lawton Report ............................................................................................ 49
   2.3 Social-ecological systems: the politics of conservation .............................................. 50
   2.4 The Nature Improvement Area Initiative and the Collingwood Reports .................. 51
   2.5 Assessing management effectiveness: Concepts and challenges ............................ 55
      2.5.1 Qualitative data; the importance of local perceptions ......................................... 56
2.5.2 Assessing concurrence: exploring the biodiversity conservation and ecosystem service delivery of an area ................................................................. 57
2.6 Highlighting the knowledge gaps ................................................................. 62
2.7 Conclusions .................................................................................................. 64

3 Research Methodology .................................................................................... 66
3.1 Research purpose and scope ........................................................................ 67
  3.1.1 Research questions .................................................................................. 68
  3.1.2 Scope of the research .............................................................................. 69
3.2 Conceptual framework for analysis ............................................................... 70
  3.2.1 The use of mixed methods ....................................................................... 73
  3.2.2 The importance of management context ................................................. 73
  3.2.3 The differences between planning and the process of implementation .... 74
  3.2.4 Conservation as a social challenge ......................................................... 75
3.3 Methodological framework .......................................................................... 76
3.4 Data collection ................................................................................................ 77
  3.4.1 Primary and secondary NIA document data ......................................... 78
  3.4.2 Conducting the interviews ................................................................. 80
  3.4.3 Informal conversations and observations .............................................. 81
  3.4.4 GIS-data acquisition and analyses ....................................................... 82
3.5 The GIS-based research .............................................................................. 82
  3.5.1 Consideration of scale .......................................................................... 83
  3.5.2 Identification of key features .................................................................. 84
  3.5.3 Selection of indicators .......................................................................... 84
  3.5.4 Quantification and aggregation of indicators ........................................ 85
  3.5.5 Buffer analysis ..................................................................................... 85
  3.5.6 Connectivity analysis .......................................................................... 86
  3.5.7 Concurrence assessment ...................................................................... 87
3.6 Data analysis and writing up ........................................................................ 87
  3.6.1 Examining copious amounts of complex information ......................... 88
  3.6.2 Analysis and presentation .................................................................... 88
  3.6.3 Reporting results ............................................................................... 89
3.7 Notes from the field ..................................................................................... 90
  3.7.1 Research ethics ................................................................................... 90
  3.7.2 Connecting with people: Continuity within the NIAs ....................... 91
  3.7.3 “Why would an American be interested in the NIAs?”: As a non-British researcher ................................................................. 91
3.7.4 “They’ll be frank to you,”: As someone outside the NIA Initiative .......... 92
3.8 Conclusions ........................................................................................................... 93

4 The Development of the Nature Improvement Area Initiative: ERZs and the NIAAs ................................................................................................................. 94

4.1 Policy drivers: Ecological Restoration Zones and Nature Improvement Areas 96
4.2 Management contexts and partnership perspectives on England’s ecological network .......................................................... 105
  4.2.1 Participation: ERZs and NIAAs ............................................................. 105
  4.2.2 Management contexts and the 12 NIAAs .......................................... 109
4.3 Biophysical requirements of the ERZs and NIAAs and features of the 12 individual NIAAs ................................................................................................. 116
4.4 Recommendations for action: how to achieve the ERZs and NIAAs .......... 130
4.5 Desired outcomes: What the ERZs, NIAAs and individual areas hoped to achieve ......................................................................................................................... 137
4.6 Funding recommendations: Comparing the ERZs and the NIAAs .......... 143
4.7 Conclusions ............................................................................................................. 147

5 Assessing the implementation of the NIA Initiative ........................................ 150

5.1 The NIA Timeline ..................................................................................................... 152
  5.1.1 Individual NIA perspectives on the competition process: partnership structures .......................................................... 155
  5.1.2 NIA perceptions of the implementation process ................................. 157
5.2 Objectives and targets of the NIAAs ................................................................ 162
  5.2.1 NIA objectives and targets: what were they aiming to do? ............... 163
  5.2.2 The objectives of the individual NIAAs and the multiple mandates: what were their goals for biodiversity conservation, ecosystem service delivery and community engagement? ................................................. 171
5.3 Monitoring and the NIAAs ..................................................................................... 174
  5.3.1 Framing of the monitoring system ......................................................... 176
  5.3.2 NIA Indicators; how useful are they? .................................................... 180
  5.3.3 Applying the system; what indicators were reported on? .................... 182
  5.3.4 Monitoring the NIAAs: a system that was unlikely to last .. .............. 184
5.4 NIAAs and England’s existing ecological network ........................................... 185
  5.4.1 The buffering potential of the NIAAs .................................................... 186
  5.4.2 NIAAs and the connectivity of England’s ecological network ............. 196
5.5 Were there win-win opportunities for biodiversity and ecosystem service delivery in the NIAAs? .............................................................. 206
  5.5.1 Selection of indicators and data ............................................................. 207
5.5.2 Identification of potential synergies and trade-offs between biodiversity and ecosystem service delivery in the NIAs: Are there win-wins? .................213

5.6 Conclusions: ........................................................................................................226

6 Outputs and outcomes of the NIAs: did the Initiative achieve what it intended to?..................................................................................230

6.1 Biodiversity and ecosystem service outcomes…were they inevitable? .......232

6.2 Community engagement ..................................................................................241

6.2.1 Community engagement in the NIAs ..........................................................242

6.2.2 The NIA brand: the use of the NIA designation in the individual areas ..247

6.3 Collaboration, both within the Initiative and beyond.......................................250

6.3.1 Partnership working and collaboration within the NIAs.............................250

6.3.2 Collaboration between NIAs…sort of ..........................................................252

6.3.3 Collaboration with other initiatives outside the NIAs...............................255

6.4 National leadership...........................................................................................258

6.5 Behavioural change…were the NIAs effective in working towards the desired step change?.................................................................261

6.6 Conclusions ........................................................................................................264

7 The Future of the NIAs ..........................................................................................266

7.1 Designing the program; how to achieve the step-change?...............................267

7.1.1 Landscape-scale programs in the UK..........................................................268

7.1.2 Engaging diverse partnerships of local people...........................................275

7.2 Objectives and monitoring: measuring success ................................................278

7.3 Looking to the future: the impact of funding ..................................................285

7.3.1 Landscape-scale funding ............................................................................285

7.3.2 The future of the NIAs ...............................................................................290

7.4 Conclusions ........................................................................................................295

8 Conclusions...........................................................................................................298

8.1 The NIA Initiative and key contributions........................................................299

8.2 Linking management contexts, biophysical features and national agendas 300

8.3 Biodiversity conservation and ecosystem service delivery: achieving sustainable land use .................................................................303

8.4 Outputs and outcomes: challenges in landscape-scale implementation ..306

8.5 Learning from the NIA initiative: lessons for future landscape proposals.308

8.6 Reflections on the research .............................................................................310

Works Cited..............................................................................................................315

Appendices..................................................................................................................348
Appendix I................................................................................................................................. 348
Appendix II ................................................................................................................................. 350
Appendix III ............................................................................................................................... 352
Appendix IV ................................................................................................................................. 356
Appendix V ................................................................................................................................. 357
Appendix VI................................................................................................................................. 358
List of Figures

Figure 2.1 A diagram of the features of an ecological network..............................................42
Figure 2.2 An illustration of three categorisations of protected areas in England..............45
Figure 2.3 A general framework for a successful landscape-scale system in the
achievement of objectives. ........................................................................................................48
Figure 2.4 The logic model for the NIA evaluation.................................................................52
Figure 2.5 Sources of data and information supporting the evaluation of the NIA
Initiative conducted in the Final Monitoring and Evaluation Report.................................54
Figure 3.1 The conceptual framework of management effectiveness analysis
employed in this research........................................................................................................71
Figure 3.2 Typical steps followed in the mapping of biodiversity and ecosystem
services......................................................................................................................................83
Figure 4.1 Characteristics of management groups and classification of individual
NIAs........................................................................................................................................110
Figure 4.2 A breakdown of the types of stakeholders involved with individual NIAs.
................................................................................................................................................111
Figure 4.3 A plot illustrating the range of sizes for the various individual NIAs,
AONBs and NPs as well as the average size for each............................................................119
Figure 4.4 The sizes in square kilometres of the various NIAs along with the
maximum (orange) and minimum (yellow) size guidelines from the NIA Guidance
Notes.........................................................................................................................................121
Figure 4.5 Land use in NIAs as compared to AONBs and NP.............................................123
Figure 4.6 Land use in individual NIAs. ................................................................................124
Figure 4.7 Comparison of area of individual landscape designation also designated
as a small, protected area designation for NIAs, AONBs and NPs........................................127
Figure 4.8 Priority habitat and priority species richness of individual NIAs, AONBs
and NPs as well as the averages for England.........................................................................129
Figure 4.9 NIA motivations for participation in the Initiative (in % NIAs) .................140
Figure 4.10 Added Cash Value for the three management groups...............................145
Figure 4.11 Grant and Added Cash Value for the individual NIAs in Year 1.............146
Figure 5.1 Timeline of important events in the NIA Initiative...........................................154
Figure 5.2 NIA perceptions on the problems with the NIA Initiative design and
implementation process............................................................................................................158
Figure 5.3 Comparison of NIA biodiversity (BD) objectives and ecosystem service
(ES) objectives by category from two analyses, including one from the Year 2 NIA
Monitoring and Evaluation Report and author’s own..........................................................172
Figure 5.4 A breakdown of the NIA objectives into categories, presented in the NIA
Monitoring and Final Evaluation Report.............................................................................173
Figure 5.5 Number of indicators reported on for each of the three years of the NIA
initiative for the Biodiversity, Ecosystem Service and Social themes...............................183
Figure 5.6 A diagram of the buffer analysis process............................................................187
Figure 5.7 A diagram illustrating the features of relevance to the buffer analysis
including the core areas within an NIA, the NIA and a 1-kilometre area around the
NIA.........................................................................................................................................189
Figure 5.8 Land use in core areas, designation area and 1-kilometre buffer zone of
three NIAs. .................................................................................................................................193
Figure 5.9 A diagram illustrating the features of relevance to this analysis including the nodes, node attribute and dispersal paths ................................................................. 197

Figure 5.10 Box plot showing the range of ECAnorm values of the intra-connectivity analysis for the individual areas of the three landscape designations .......... 202

Figure 5.11 A scatter plot of average species richness per square kilometre and intra-connectivity for the 54 individual areas of the three landscape designations assessed in England (NIAs, AONBs and NPs) to explore the relationship between connectivity and biodiversity ........................................................................ 203

Figure 5.12 Average of the contribution of individual nodes within a designation type for each of the areas in the three landscape designations for a range of dispersal distances ........................................................................ 204

Figure 5.13 A map of all the NIAs, AONBs and NPs in England; the NIAs are labelled for reference ........................................................................ 205

Figure 5.14 Scatter plots showing the biodiversity conservation and ecosystem service delivery of certain services in individual landscape designations as well as the averages for England................................................................. 216

Figure 5.15 A figure showing the number of potential synergistic opportunities between biodiversity conservation and the delivery of certain ecosystem services in the individual NIAs at a landscape scale ........................................................................ 225

Figure 6.1 A self-assessment of progress towards partnership objectives reproduced from the Final Monitoring and Evaluation Report ................................. 235

Figure 6.2 An assessment of the success of the community engagement activities of NIAs as reported by people engaged in the NIA Initiative ......................... 244

Figure 6.3 A figure of individual areas’ use of the ‘NIA’ title or designation ................................................................. 248

Figure 6.4 A figure of the NIA respondents’ assessment of the collaboration and knowledge sharing between different NIAs during the three years of the program ........................................................................ 254

Figure 7.1 A demonstration of how the NIA Initiative fits in a rough timeline of modern (post-1960) conservation framings ................................................................. 281
List of Tables

Table 3.1 The six stages of the conceptual framework of analysis. .......................72
Table 3.2 Primary and secondary document data used in this research. .............79
Table 3.3 A table illustrating the assessment of grid squares considered to be within a designation or not; the percentage which resulted in a total area closest to that of the actual area of the 12 NIAs was chosen, in this case 50%. ..........................85
Table 3.4 Structure of the analysis and presentation of the results. ......................89
Table 4.1 Comparison of the stated objectives of the ERZs and NIAs. The accompanying numbers provide the original sequence in the source document. .........97
Table 4.2 Types of actors and stakeholders identified by the Lawton Report, the NIA Guidance Notes and Criteria and the Final Monitoring and Evaluation Report......107
Table 4.3 Table of lead bodies and their characteristics......................................114
Table 4.4 A table of GIS data sets utilised in these analyses, including source and date of access.................................................................117
Table 4.5 Assessment of statistically significant differences between actual priority habitat within the NIAs and priority habitat in randomly sampled areas of the same size in England. .................................................................125
Table 4.6 Percentage of area of individual NIAs also covered by SSSI designation by management group. .................................................................128
Table 4.7 Recommended actions for ERZs and NIAs. ......................................133
Table 5.1 Data sources and business plan development of the individual NIAs by management context group .................................................................165
Table 5.2 Table of individual NIA’s framing of objectives..................................167
Table 5.3 Table of sub-set of indicators of NIA monitoring system, adapted from 177
Table 5.4 Percentage of indicators reported out of the possible total for the themes of Biodiversity, Ecosystem Services and Social........................................183
Table 5.5 A table of all 12 NIAs presenting the proportions of each of the three types of land use in the core areas within each NIA, the rest of the NIA and the 1-kilometer zone around the NIA. .................................................................190
Table 5.6 A table of all 12 NIAs presenting the proportion of agricultural land use which is under an Environmental Stewardship Agreement (HLS+ELS) for both the NIA itself and the 1-kilometre buffer zone (BZ) around the NIA. ....................191
Table 5.7 The indicators selected for use in the biodiversity conservation and ecosystem service delivery synergy and trade-off analyses................................208
Table 5.8 Correlations among per-unit-area (1 km²) biodiversity and ecosystem service values in England. .................................................................214
Table 6.1 Biodiversity and ecosystem service outcomes as described by representatives of the individual NIAs during the semi-structured interviews. ......237
Table 7.1 The 14 largest landscape conservation programs in the UK. ...............269
Table 7.2 A table of funding type and source realised by the individual NIAs during the period from 2015 to 2019.................................................................292
### Acronyms

- **AoSP**  Areas of Special Protection  
- **BBC**  Birmingham and the Black Country NIA  
- **BD**  Biodiversity  
- **BR**  Biosphere Reserve  
- **BRN**  Biogenetics Reserve Network  
- **CBD**  Convention on Biological Diversity  
- **CEP**  Collingwood Environmental Planning  
- **CP**  Country Park  
- **Defra**  Department for Environment, Food and Rural Affairs  
- **DP**  Dark Peak NIA  
- **DV**  Dearne Valley NIA  
- **ELP**  Endangered Landscapes Programme  
- **ERZ**  Ecological Restoration Zone  
- **ES**  Ecosystem Services  
- **GIS**  Geographic Information Science  
- **GTM**  Greater Thames Marshes NIA  
- **ha**  Hectares  
- **HL**  Humberhead Levels NIA  
- **IAASTD**  Int’l Assessment of Agri. Knowledge, Sci & Tech for Dev  
- **IUCN**  International Union for the Conservation of Nature  
- **IVAR**  Institute for Voluntary Action Research  
- **JNCC**  Joint Nature Conservation Committee  
- **km**  Kilometres  
- **LNR**  Local Nature Reserve  
- **LPO**  Limestone Pavement Order  
- **MA**  Millennium Ecosystem Assessment  
- **MB**  Morecambe Bay NIA  
- **MD**  Marlborough Downs NIA  
- **MM**  Meres and Mosses NIA  
- **ND**  Northern Devon NIA  
- **NE**  Natural England  
- **NEWP**  Natural Environment White Paper  
- **NGO**  Non-governmental Organisation  
- **NIA**  Nature Improvement Area  
- **NNR**  National Nature Reserve  
- **NV**  Nene Valley NIA  
- **RIGS**  Regionally Important Geological and Geomorphological Sites  
- **SAC**  Special Area of Conservation  
- **SD**  South Downs Way Ahead NIA  
- **SPA**  Special Protection Area  
- **SSSI**  Site of Special Scientific Interest  
- **TNC**  The Nature Conservancy  
- **UK NEA**  UK National Ecosystem Assessment  
- **WP**  Wild Purbeck NIA  
- **WWF**  World Wildlife Fund
1 Introduction

This thesis is an investigation into the design, implementation, management, outputs and outcomes of the Nature Improvement Area (NIA) Initiative with consideration for the political process of conservation. Specifically, it examines the management effectiveness of the NIA Initiative in achieving its multiple stated objectives of biodiversity conservation, ecosystem service delivery and community engagement in twelve landscape-areas across England. This thesis uses local knowledge at multiple scales and examines all aspects of the Initiative to understand what the outputs and outcomes were but also why or why not those outputs and outcomes were achieved and how these can inform future landscape-scale endeavours. The research along with its findings tackle critical gaps in the understanding of the management effectiveness of both the NIA Initiative but also landscape-scale programs in general in research today, thereby contributing to a developing body of literature on effective conservation interventions aimed at achieving sustainable landscapes in the face of global change.

This chapter begins by emphasising the importance of this work and why the NIA Initiative was selected as a focus for exploring the management effectiveness of landscape-scale conservation programs. Next, the research approach, overall aim and research objectives are introduced. Finally, the chapter finishes by outlining the general structure of this thesis.

1.1 Background and context: Landscape management

Landscape-scale approaches form key parts of making progress both towards the Aichi targets of the UN Convention on Biological Diversity as well achieving coherent and resilient landscapes in the face of climate changes (Sayer et al, 2017; Reed et al, 2016; Harvey et al, 2014; Scherr et al, 2012). A key feature of landscape approaches is that they aim to facilitate long-term improvements in conservation, ecosystem service delivery, and the lives of the people in the local communities within and around the areas of interest (Estrada-Carmona et al, 2014). Community engagement is considered important in achieving these improvements, often emphasising the engagement and empowering of the people who are affected (Sayer et al, 2017; Smith et al, 2009; Pfund, 2010; Milder et al, 2014). Furthermore, adaptive management, that is flexibility and learning, and the need for an inclusive view of
outputs, outcomes and impacts in a continuously fluctuating context, are acknowledged as key elements of landscape methodologies (Sayer, 2009) particularly as conservation is a political process (Adams and Hutton, 2007). The immediate outputs of landscape approaches are the immediate achievements of the intervention. Outcomes are the short-term changes in the state or condition of the environment or local people. Impacts are longer term successes in reaching targets set for the landscape approach or intervention. Landscape approaches are not without their challenges, however; landscapes evolve gradually over long periods while being impacted by various drivers of change thus making their already difficult-to-assess features harder to measure (Pfund, 2010).

1.2 Sustainable Landscapes: the multiple objectives of biodiversity conservation and ecosystem service delivery

Anthropogenic impacts on the earth since the middle of the 20th century have altered natural systems at a greater pace and more broadly than any other equivalent period when considering human history (MA, 2005). The benefits to society and development, both in terms of well-being and economic advances, are substantial but they have come at the expense of the destruction or degradation of much of the natural environment. While wild nature conservation has traditionally emphasised biodiversity, recently there has been a shift to another focus: ecosystem services or the goods and services which benefit society that are derived from natural systems (Naidoo et al, 2008). While small protected areas have been emphasised in the past, attention has shifted some to large-scale conservation areas to help overcome limitations with existing protected area networks.

Biodiversity, an incredibly complex concept with many definitions and even more measures, underpins ecological and environmental processes within ecosystems (Mace et al, 2012). Final goods and services are derived from the stocks and flows of natural systems which are underpinned by interactions between the biotic and abiotic elements and the ecological and evolutionary processes of ecosystems (Fisher et al, 2008). The Millennium Ecosystem Assessment or MA (2005) has demonstrated that the continued supply of ecosystem services is under pressure as a result of unsustainable human activities despite the fact that these services are essential to human well-being (Balmford et al, 2002).
As global human populations increase, requirements for ecosystem services will almost certainly continue to rise significantly as will the pressures on the natural environment (MA, 2005). This results in the need to manage trade-offs between immediate societal requirements while ensuring the maintenance of the capacity of the earth to provide goods and services into the future (Foley et al, 2005). It is necessary, however, to better understand the multiple benefits, that is the various ecosystem services, goods and values that might potentially be expected of many ecosystems. This is particularly key as most decisions regarding the way an ecosystem is managed will likely involve trade-offs between objectives (Mace et al, 2012) and the development of these objectives and priorities is a political process (Adams and Hutton, 2007). While many trade-offs are comparatively well characterised, others are poorly understood.

Successfully integrating ecosystem services into present or future conservation programs requires a broader evaluation of the political processes of delivery of biodiversity and ecosystem services in protected areas and landscapes in the context of current management strategies and assessing the synergies and trade-offs between spaces which delivery ecosystem goods and services and those that support biodiversity (Naidoo et al, 2008). Research suggests, however, that such concurrence cannot be assumed but instead must be empirically assessed (Naidoo et al, 2008; Anderson et al, 2009; Chan et al, 2006; Maes et al, 2012). The body of work supporting understanding of broader spatial patterns of concurrence of biodiversity and ecosystem services is still developing (Anderson et al, 2009). Furthermore, landscapes are complex, continuously evolving and the processes context-specific resulting in challenges around applying a standardised approach of outcome and impact measures to different areas. (Sayer et al, 2017). It is necessary to consider a variety of social, political and ecological metrics throughout the process to examine progress.

1.3 Conservation in England: England’s ecological network

In 2010, a report titled Making Space for Nature: A Review of England’s Wildlife Sites and Ecological Network (Lawton et al, 2010), also known as the Lawton Report, was published. It examined the state of England’s protected areas and ecological network. The Report (Lawton et al, 2010) concluded that, while the network provided benefits for wild nature, more could be done to achieve a truly coherent and resilient ecological
network when considering various, potentially competing demands from the landscape and global change. Among the recommendations in the report was a call for Ecological Restoration Zones or ERZs. ERZs were to be landscape-scale areas which facilitated the sustainable use of the landscape through the promotion of core spaces for wild nature in areas which focused on ecological function surrounded by buffers and sustainable use areas and connected by corridors or stepping stones which allowed for a coherent and resilient ecological network.

1.4 The landscape approach: the NIA Initiative

The NIA Initiative was created in response to the Lawton Report’s (Lawton et al, 2010) recommendations for ERZs, landscape-areas which provided benefits for both wild nature and people. The Initiative was announced in the 2011 Natural England White Paper; it had six objectives including biodiversity conservation, ecosystem service and community engagement targets; furthermore, the Initiative put a great deal of emphasis on win-win situations for wild nature and people, touting both economic and environmental objectives. The competition to choose the 12 NIAs was launched in July 2011 and the deadline for bids was 30 September 2011. It was overseen by a Steering Group which was led by Defra and included members from various bodies such as Communities and Local Government, the Environment Agency, the Forestry Commission and Natural England. £7.5 million was available to be split between the winning bids, not necessarily in equal values, over a 3-year period. The competition was run in three stages; an initial application form or bid, the submission of a detailed business plan, and then finally a presentation by at least two of the partners of their proposals / business plans in October 2011 to an independent panel, chaired by Professor Sir John Lawton, which would then assess the applications and select the 12 winning bids / areas. Natural England was to manage the delivery of the Initiative with support from other public bodies. There were 76 applications for the first stage. Applications were judged against both the biophysical and management criteria set out in the accompanying documentation and against other proposals. Ultimately, 12 areas were chosen and provided with funding for three years between 2012 and 2015. This thesis examines the management effectiveness, that is the design, implementation and management, of the NIA Initiative at both national and local levels, examining whether it embodied Lawton’s recommendations for ERZs as well as its own objectives of biodiversity conservation and ecosystem service delivery all while encouraging community engagement in the conservation dialogue and process.
1.5 Management effectiveness: the IUCN framework

Management effectiveness is the assessment of the success of an area in achieving its stated goals following an intervention. Despite the recent surge in landscape-scale programs, little has been done to assess the effectiveness of individual interventions (Reed et al, 2016). The monitoring and evaluation of landscape-scale approaches is necessary for the generation of the information needed to allocate resources, learn and adapt (Sayer et al, 2017). The IUCN Management Effectiveness Framework offers a widely used option for undertaking such an assessment. It frames the approach such that protected area / landscape management follows a process that includes six different steps, or stages:

- “it begins with reviewing context and establishing a vision for site management (within the context of existing status and pressures),
- progresses through planning and
- allocation of resources (inputs), and
- as a result of management actions (process),
- eventually produces goods and services (outputs),
- that result in impacts or outcomes,” (Hockings et al, 2006, p vii).

The benefit of the approach is that it provides a flexible framework that is adaptable to specific circumstances such as the NIA Initiative and includes elements overlooked by the limited existing evaluation of the annual NIA Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) which is addressed in the following section.

1.6 Identifying the knowledge gaps: the NIA Monitoring and Evaluation Reports

The major short-coming of the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) is that they fail to examine the complete process of designing, implementing and managing a landscape-scale initiative. The Final Monitoring and Evaluation Report (CEP, 2015a), where most of the existing analysis of the NIA Initiative is presented, was commissioned by the public bodies overseeing the Initiative and is based upon a logic model which focuses on understanding the impacts of a policy intervention as well as the association between an intervention’s inputs and activities on its outputs and outcomes. This approach supposedly
emphasised impact and process evaluation, but in reality concentrated more on what and how much the NIAs were delivering, particularly at a national level, rather than how the partnerships delivered their objectives. The Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) also attempt to examine the contribution of the NIAs over and above what might have happened anyway, although this was limited in its success. In addition to data collected through the monitoring system, the analysis utilised semi-structured interviews with the heads of the partnerships and an online survey of some of the other participants. There are, however, some fundamental problems with this assessment beyond the fact that it misses out most stages of the management effectiveness framework besides outputs and outcomes.

Firstly, the approach overlooks entirely the question of whether the NIA Initiative constituted an appropriate response to the call for such areas in the Lawton Report (Lawton et al, 2010), particularly with regard to the multiple, potentially confliction objectives of the NIA Initiative. The Lawton Report had a very specific goal, championed in the title, of 'making space for nature' through means of a 'step-change' in the current approach to conservation and it is necessary to explore whether and how effectively this was translated into the objectives of the NIA Initiative. Assessment of progress towards this step-change, realised through greater involvement of local people and communities in the conservation dialogue, speaks to an identified prioritised research question, namely “what is the best way to engage and communicate with the public on the importance of biodiversity and ES, and to encourage society to take greater ownership of the impacts?” (Hossain et al, 2017, p 252). It is essential to explore how effective the NIA Initiative was in achieving this objective.

Secondly, the conceptual framework used by the Final Monitoring and Evaluation Report (CEP, 2015a) overlooks the context of the 12 partnerships. This research holds that the existing management structures, their socio-political processes, and the biophysical features have an important influence on the motivations behind the bids for the NIA Initiative as well as the formation of the partnerships, the individual area selections, the development of their objectives and management strategies and ultimately their contributions to the existing ecological network(s). It further contends that the NIAs must be explored as individual areas instead of only scaling up to the national level and the Initiative as a whole. Understanding how the areas were managed prior to the NIA Initiative is key to understanding whether or not the Initiative achieved its overall objectives of multiple benefits for both wild nature and people. Furthermore, the objectives of the individual NIAs are not fully explored, particularly
with consideration for the overall aim of providing win-win scenarios for both biodiversity conservation and ecosystem service delivery. Exploring individual NIA potential for win-win scenarios is key, both with regard to their management choices as well as their biophysical features.

Thirdly, while there is a brief examination of the local partnerships in the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a), there is minimal consideration of collaboration or partnerships between the NIAs, partnerships with organisations outside the NIAs or the contributions of the national leadership to the NIA partnerships. Data-sharing was an important feature of the original, national objectives (NIA 1) and understanding of such collaboration provides insight as to how the NIAs interact with existing ecological network(s), particularly with regard to other landscape designations.

Fourthly, the outputs and outcomes of the NIAs with regard to biodiversity conservation and ecosystem service delivery provide little if any discussion of the potential for win-win scenarios which was a key feature of the program objectives and thus deserves further consideration. Additionally, while the overly optimistic successful outputs and outcomes are presented in the published assessment, there is no discussion of why those outcomes were, or were not in many cases, achieved nor how they should effectively inform future work.

Finally, the Final Monitoring and Evaluation Report (CEP, 2015a) relied on data collected through semi-structured interviews with partnership chairs. While this undoubtedly provided valuable information, this research argues that it is necessary to connect in an in-depth manner with people responsible for the on-the-ground delivery of their NIA projects. Such individuals could provide important information regarding the local contexts of the different NIAs and would potentially have a different perspective on outputs, outcomes and community engagement. Furthermore, it is contended that participants would likely be more open and franker with someone not directly involved with the Initiative than with representatives of the administering body.

Ultimately, an assessment of all stages of the management effectiveness of the landscape-scale NIA Initiative at both local and national levels could better explore the past and future impact of the Initiative on England’s ecological network and contribute significantly to the currently limited understanding of the efficacy of landscape-scale interventions and provide essential information for future endeavours.
1.7 Research objectives and design

This work adds to this key body of research by examining the management effectiveness of a landscape-scale program, namely the NIA Initiative. It does so not only by exploring all aspects of management effectiveness, many of which were overlooked in the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a), but also by examining both what outputs and outcomes were achieved and, most significantly, why.

This work bridges key gaps in the research on management effectiveness of landscape-scale programs. Furthermore, instead of relying purely on either quantitative, data-driven understandings of the biophysical features of the 12 areas or qualitative questionnaires about management, this research incorporates both geo-spatial examinations of the biophysical features of the NIAs with the perceptions and experiences of those involved in the day-to-day management of the NIAs. The study draws on a mixed-methods approach to management effectiveness which places the local area managers at the centre, and which examines the outputs and outcomes of the Initiative in the context of the complex socio-ecological and political systems of the areas at both local and national levels. The management effectiveness analysis is conducted using both a quantitative indicator-based framework to explore the biophysical features of the NIAs and potential synergies and trade-offs between the multiple objectives of biodiversity conservation and ecosystem service delivery as well as narrative-driven, qualitative research. Field research was conducted from late 2015 through early 2017 in England through semi-structured interviews (n = 12) with NIA managers and personnel as well as through discussions with people involved in the national-level management of the NIA Initiative (n =3).

Specifically, the research has four main objectives:

(i) To examine the NIA Initiative as a response to the call for Ecological Restoration Zones as put forth in the Lawton Report (Lawton et al, 2010): through an exploration of primary data documenting key components of the design of the NIA Initiative, data from the NIA managers and the triangulation of this data with secondary data.

The areas tackled under this objective include an analysis of both the ERZs and the NIAs and their:

- policy drivers: What were the key objectives of the ERZs and NIAs?
management contexts: How did the Lawton Report (Lawton et al, 2010) and the NIA Initiative envision the local partnership of people?

biophysical requirements: What were the desired biophysical features of the ERZs and NIAs?

recommendations for action: how was the implementation of the ERZs and NIAs envisioned?

desired outcomes: what were the ultimate purposes of the ERZs and NIAs?

funding recommendations: how was the funding for the ERZs and NIAs envisioned?

(ii) To explore the implementation of the NIA Initiative and the resulting impact on the achievement of its multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement in the process: through an examination of the perspectives of the NIA managers and the triangulation of their experiences with secondary data.

The items discussed under this objective includes analysis of the NIA:

- Timeline: Was the timeline appropriate for the scale of the program?
- Objectives and targets: What were the objectives and targets of both the individual NIAs and how do these compare with the national, program-level objectives?
- Monitoring system: Was the monitoring system effective in its assessment of the multiple objectives of the NIA Initiative?
- Buffering potential: Could the NIAs provide suitable buffers for the core sites for nature within them?
- Connectivity: How do the NIAs contribute to the connectivity of England’s ecological network?
- Concurrence of biodiversity and ecosystem service delivery: Do the NIAs provide potential win-win scenarios for both biodiversity conservation and ecosystem service delivery? Are there potential trade-offs?

(iii) To examine the outputs and outcomes of the NIA Initiative as well as why those outputs and outcomes were or were not achieved: through a comparative analysis of the primary data from the NIA managers and secondary data.

The work examined under this objective includes the outputs and outcomes of the NIA Initiative with regard to:
- Biodiversity conservation and ecosystem service delivery: were 
  potential win-win scenarios capitalised on?
- Community engagement: did the NIAs achieve their objective of 
  widespread community engagement?
- Collaboration: did the NIAs improve collaboration within, between and 
  outside of the partnerships?
- National leadership: was the national leadership of the NIA Initiative 
  effective?
- Behavioural change: did the NIAs achieve a step-change in the current 
  approach to conservation?

(iv) To provide evidenced-based recommendations: to ensure future 
endeavours aimed towards sustainable land management in the UK are 
better designed, managed and implemented to address the needs of 
England’s diverse landscapes and societies.

Research addressed under this objective includes an examination of the 
follows:
- The context of landscape-scale programs in the UK including common 
  features and challenges: did the NIA Initiative improve on existing 
  landscape-scale initiatives?
- Bottom-up versus top-down conservation approaches: did the NIA 
  Initiative work effectively across multiple scales?
- The future of the NIAs: are the individual areas and the program likely 
  to continue into the future?
- Identification of the successes and failures of the NIA Initiative and 
  recommendations for similar, future landscape-scale programs: what 
  recommendations could be made for future programs?

1.8 Unique contributions of the research

Through addressing these objectives, this research will make the following unique 
contributions to landscape-scale management effectiveness research and is 
motivated by the importance of the knowledge gaps presented in Section 1.6:

1. Illustrate the value of local context in the effective implementation and 
management of a conservation initiative;
2. Discuss the importance of the consideration synergies and trade-offs between objectives in all aspects of design, implementation and management of a landscape-scale conservation initiative;

3. Emphasise the importance of scale by providing an examination of local and national perspectives in landscape management effectiveness;

4. Provide recommendations for improvements to similar, future landscape-scale programs; and,

5. Enhance understanding of landscape management effectiveness through incorporation of characteristics specific to the unique nature of landscape-scale initiatives.

1.9 Structure of the thesis

The thesis is structured into eight chapters, including this introductory chapter. The remainder of this work is organised as follows:

**Chapter 2** provides an in-depth review of the main study concepts. It begins by detailing the complexities of sustainable landscape management, particularly in managing for both biodiversity conservation as well as ecosystem service delivery when there are both potential synergies and trade-offs between the two objectives which can vary across scales. It first explores the concepts of biodiversity and ecosystem services, then sets these two concepts in the context of the ecological network and protected areas in England. It considers the impact of scale and discusses the Lawton Report (Lawton et al, 2010) which examined the state of the ecological network in England and made recommendations for the achievement of a coherent and resilient network of areas that provides space for nature. The chapter then considers the role of people in conservation acknowledging elements of political ecology to explore the impact of values on the implementation of conservation efforts. The chapter then introduces the Nature Improvement Area Initiative, detailing the many oversights in the single examination of the program produced for the overseeing body and then clearly outlines how a critical assessment of the management effectiveness of the Initiative can provide insight into gaps in the literature regarding the effectiveness of landscape-scale conservation programs.

**Chapter 3** presents the research methodology. It starts with an introduction of the epistemological choices in choosing a framework for analysis for an assessment of management effectiveness. It presents the research questions and the methods
followed in developing the conceptual framework including how both quantitative and qualitative data are brought together in a mixed-methodological approach. The data collection methodologies used in the study are addressed. There is also an in-depth discussion of the GIS-based research and the three geo-spatial analyses, namely the buffer analysis, the connectivity analysis and the concurrence assessment. It includes a discussion of data analysis as well as material on data triangulation. Finally, it presents an overview of challenges and limitations around conducting the research, which includes ethical considerations, issues relating to continuity within the NIAs, being a non-British researcher and as someone outside the NIA program.

**Chapter 4** addresses the first research objective: to explore whether the NIA Initiative embodies the recommendations of the Lawton Report (Lawton et al, 2010) for ERZs. The analysis is first conducted using primary NIA data and secondary data followed by the analysis of local NIA perspectives. The research examines how the ERZ and NIA approaches compare with regard to policy drivers, stakeholder participation, biophysical requirements, endorsed actions, desired outcomes and funding recommendations. The research examines how the ERZs were envisioned by the Lawton Report (Lawton et al, 2010) and compares this to how the NIAs were ultimately designed and implemented. Finally, this chapter provides unique evidence and insights into the importance of the consideration of local context in the design and implementation of conservation programs.

**Chapter 5** addresses the second research objective: to examine the implementation of the NIA Initiative and whether it truly facilitates the achievement of its multiple stated objectives. In revisiting the key concepts of sustainable landscape management highlighted in the literature review, it underscores the importance of considering potential conflicts between various objectives in sustainable landscape management. The chapter presents a mixed-methodological approach to a management effectiveness assessment of the NIA Initiative. The chapter examines the NIA timeline, the objectives and targets at both national and local levels and the monitoring system and combines these with geo-spatial analyses of the buffering, connectivity and concurrence potential of the individual NIAs to examine the program implementation and its impact on the attainment of its varied objectives. The purpose of this chapter is to provide an understanding of the execution of the NIA Initiative at both national and local levels. Through an examination of the impact of management contexts and responses of the local NIAs, this chapter also provides an overview of the potential synergies and trade-offs between biodiversity conservation and ecosystem service delivery objectives and highlights the multiple perspectives within
and features of landscape-scale programs that contribute to challenges in implementation.

**Chapter 6** addresses the third research objective: to examine the outputs and outcomes of the NIA Initiative and why or why not certain objectives were achieved. To do so, it employs an examination of primary data from the interviews with the managers of the 12 NIAs and compares it with secondary data from the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014: CEP, 2015). The outputs and outcomes considered are biodiversity conservation and ecosystem service delivery, community engagement, collaboration, national leadership and behavioural change. The purpose of this chapter is to provide an understanding of what the NIA Initiative did or did not achieve but, more importantly, why and the impact of management context on those outcomes. Through an examination of the individual perceptions and experiences of the NIAs based on the interviews with people involved with the on-the-ground management of the areas, this chapter provides an investigation into and comparison of not only the national outputs but the outputs of the local areas as well in the context of the original stated objectives.

**Chapter 7** addresses the fourth and final objective: to provide evidence-based recommendations for future endeavours. To do so, it puts the NIA Initiative in the context of other landscape-scale programs in the UK and brings together evidence from the three previous analysis chapters to explore the strengths and weaknesses of the NIA Initiative. It then provides recommendations for future endeavours using the design features of the NIA Initiative to provide guidelines. The analysis highlights the unique challenges of landscape-scale conservation in addressing the multiple objectives of biodiversity conservation and ecosystem service delivery while engaging the public to facilitate sustainable landscape use in the long-term. The chapter concludes with recommendations for decision makers and emphasises the benefits of landscape-scale programs in conservation efforts.

**Chapter 8** concludes the thesis by pulling together all the key elements and findings of the thesis and demonstrating how the thesis has addressed the research objectives. This chapter underlines the empirical, methodological and conceptual contributions of the investigation to landscape evaluations in England and to broader research on landscape-scale conservation programs and sustainable land management. It also presents concluding reflections and potential avenues for future research.
2 Literature Review

The Nature Improvement Area Initiative ran from 2012 to 2015 and yet little has been done to address the challenging task of assessing the conservation management effectiveness of the intervention at both national and local scales. Furthermore, even less consideration has been given to the “why” of the outcomes and how the design and implementation of the Initiative, particularly with regard to the political and social contexts of the individual areas, impacted those outcomes nor how this should inform future work. There are a variety of approaches available to assess management effectiveness and debates about the best way to do so including methodological considerations with regard the type of data and the best indicators for measurement of the biophysical features interest. In this chapter, the development of key concepts, theories and methods are explored to better understand management effectiveness. This includes exploration of the definitions and framings of biodiversity, ecosystem services, ecological networks and sustainable landscapes, particularly in England. The discussions in this chapter will demonstrate why managing landscapes for multiple objectives is so challenging and will recognise the importance of local communities in such socio-ecological systems. Furthermore, one of the key contributions of this chapter is to examine the oversights in the existing Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) on the NIA Initiative by employing the IUCN Management Effectiveness Framework to highlight those gaps.

This chapter is structured as follows:

Section 2.1 begins with an overview of landscape management. This section defines and frames biodiversity and ecosystem services, then explores how the two concepts interact with regard to sustainable landscapes;

Section 2.2 focuses on the ecological network and space for nature in landscapes, particularly examining protected areas and designations in England. It then introduces the Lawton Report (Lawton et al, 2010), the report which provided the recommendations on which the Nature Improvement Area Initiative was based;

Section 2.3 examines socio-ecological systems and the politics of conservation, particularly emphasising community engagement in conservation which is key for achieving a step-change, the overall goal of both the Lawton Report (Lawton et al, 2010) and the NIA Initiative;
Section 2.4 introduces the Nature Improvement Area Initiative and the Collingwood Reports, the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014; CEP, 2015) which provide the overseeing body’s limited assessment of the management effectiveness of the NIA Initiative;

Section 2.5 explores the diverse set of methods used to assess management effectiveness, highlighting some of the main conceptual, methodological and operational challenges;

Section 2.6 presents the strengths and limitations of the existing body of work using the IUCN Management Effectiveness framework to highlight the knowledge gaps; and Section 2.7 concludes the chapter by reinforcing the knowledge gaps.

2.1 Defining and framing landscape management

Natural systems have changed extensively and at an incredibly rapid pace, particularly over the last 50 years. These changes, largely a result of anthropogenic impacts on earth systems, have been more rapid than any other comparable period throughout human history (MA, 2005). While the associated benefits to society and development, both in terms of well-being and economic advances, are considerable, they have resulted in significant damage to much of the natural environment and with substantial losses of wild nature. In the past, wild nature conservation has focused on biodiversity, but there has been a recent shift in focus towards the goods and services derived from ecological systems that benefit society, namely ecosystem services (Naidoo et al, 2008).

Biological diversity or biodiversity, the variation of life found on earth from all sources and across scales, is an incredibly complex concept with many different measures and which underpins ecological and environmental processes within ecosystems. The stocks and flows that underlie final ecosystem goods and services are a result of the interactions between the biotic and abiotic elements of ecosystems which involve a range of ecological as well as evolutionary processes (Mace et al, 2012). These goods and services, often classified as supporting, regulating, provisioning or cultural services, are essential to human well-being. The Millennium Ecosystem Assessment or MA (2005) has specifically recognised the necessity of ecosystem services to society and highlighted the threat to these services from unsustainable anthropogenic activities (Balmford et al, 2002).
The current state of ecosystem services is crucial because as global human populations grow, demand for ecosystem goods and services will unquestionably continue to rise significantly which will in turn cause continued pressures on natural systems (MA, 2005). Thus, it becomes a challenge of managing trade-offs by balancing immediate needs with long-term sustainability by ensuring the ability of the biosphere to deliver ecosystem goods and services into the indefinite future (Foley et al, 2005). Protected areas and designations form an important part of the global initiative to protect wild nature and ensure the continued function of the ecosystems within these areas (Margules and Pressey, 2000). However, most decisions regarding the way an ecosystem is managed within these spaces will result in some sort of trade-off, either between service delivery and wild nature or among different services (Mace et al, 2012). When considering how to successfully integrate ecosystem service delivery into present or future conservation programs, particularly in the form of protected or designated areas, it is necessary to more broadly evaluate the effectiveness of programs like the NIA Initiative and assess the impacts of management strategies on the achievement of the identified objectives and targets.

2.1.1 Defining biodiversity

It is essential to protect wild nature or biodiversity for both its current and future benefits but also for its intrinsic value. To protect wild nature, however, it is first necessary to understand the term. Wild nature is most commonly understood as biological diversity or biodiversity when describing protected areas and biodiversity is an incredibly complex concept with many definitions. The Convention on Biological Diversity or CBD defines biodiversity as “the variability among living organisms, from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems” (CBD, 1992, p 3). This is an inclusive but complex definition, thus often only certain aspects of biodiversity are considered when attempting to conserve it in practice; specifically, most often whatever aspects are deemed most valuable or achievable by the governing actors. The key feature of the CBD definition is the concept of variability, particularly considered to be the extent of variation in this case as opposed to a precise spatial or temporal component. Furthermore, the CBD definition stresses variability at three levels, within species, between species and of ecosystems, and the complexes which they are a part of. The reference to the complexes which they are a part of is, in particular, of key...
importance in that it acknowledges that “ecological interactions are both causes and consequences of biodiversity” (Mace et al, 2012, p 20).

The CBD definition is a particularly useful definition because it “is in common usage, has policy status and is inclusive” (Mace et al, 2012, p 20). The choice of a definition of biodiversity has, in turn, implications for metrics or indicators used to measure it. It also has implications for metrics used to measure ecosystem services. The CBD definition does not reflect some biodiversity metrics relevant to ecosystem services, but it can be interpreted in broad sense thus making it operational for most management effectiveness assessments.

The term ‘wild nature’ is used throughout this thesis as the laymen’s version of ‘biodiversity’. The term wild nature is considered to embody all the key elements of biodiversity, the variability in species and ecosystems across all levels and including the biotic and abiotic components. However, it is acknowledged that there is a value driven aspect to the term ‘wild nature’ in the sense that the emphasis is on ‘wild’ suggesting an exclusion of humans and thus perhaps illustrating a sub-conscious preference on the part of the researcher for systems which exclude people. It is useful to consider this in the context of self-evaluation and the place of the researcher in this work.

2.1.2 Defining and framing ecosystem services

The concept of ecosystem services is also a complex one that can be approached in many different ways. The Millennium Ecosystem Assessment, or MA (2005), describes ecosystem services as the value or benefits that humans derive from ecosystems. It classifies these services into four categories: provisioning, regulating, cultural and supporting services. Provisioning services are described as the goods or products that humans derive directly from ecosystems, regulating services as the benefits resulting from the regulation of ecosystem processes, cultural as the non-material benefits obtained from the variety of experiences resulting from interacting with nature and supporting as those services necessary for the provision of all other types.

The categories, however, have been criticised for their potential overlap and many studies have since proposed refinements. Furthermore, any economic valuation of services requires a differentiation between final goods and services and the
environmental or ecological processes that underpin them. It is the interactions among the biotic and abiotic elements of the systems, that are dependent upon ecological and evolutionary processes, which ultimately lead to final goods and services. The goods, however, and the processes which deliver those final services, often require additional inputs and any value to people depends upon both the context and the additional inputs. Often, though, the focus of management strategies is on the final outputs as opposed to the underpinning processes. Moreover, research suggests that there is a “cultural divide between biodiversity groups and associated ecosystem services” (UK NEA Chapter 4, 2011, p 65). This divide consists of culturally significant biodiversity assemblages on one side and biodiversity assemblages that support provisioning and regulating services on the other.

Alternative approaches addressing these concerns with ecosystem services research have been suggested. Seppelt et al (2011) conducted a review of ecosystem service studies and identified four elements that they suggest describe the ideal framework of ecosystem services investigation. These are “[i] biophysical realism of ecosystem data and models; [ii] consideration of local trade-offs; [iii] recognition of off-site effects; and [iv] comprehensive but critical involvement of stakeholders within assessment studies” (Seppelt et al, 2011, p 630). Biophysical realism identifies the measurement, modelling and monitoring of ecosystem processes and functions as the basis of ecosystem services exploration. In order to provide accurate research, Seppelt et al (2011) suggests studies must include “environmental data, model-based relationships for ecosystem function and feedback and tests of assessment for robustness and uncertainties (Oreskes, Shrader-Frechette & Belitz 1994; Jakeman, Letcher & Norton 2006)” (Seppelt et al, 2011, p 633). The consideration of trade-offs looks at temporal and spatial patterns that occur as a result of feedback in ecological processes which result in gains and losses in different ecosystem services. The recognition of off-site effects considers the potential that local decisions can have long-reaching impacts on distant ecosystem services, particularly with increasing globalisation and must be taken into account in ecosystem services research. Finally, the involvement of stakeholders is considered an important instrument to relate ecosystem functioning to human well-being. It involves three aspects: one, that stakeholders help to identify those ecosystem services particularly relevant to them, two that they assist in the development of management strategies and three, they evaluate different management options by, for instance, identifying those strategies impacting services which are most important for them. The researchers emphasise that these four facets are intended to guide critical self-assessments of the validity of
research in order to ensure scientific quality and have a lasting impact. However, it should also be recognized that practical difficulties will require compromises and adjustments which should be clearly stated and acknowledged. Ultimately, despite the drawbacks of the provisioning, regulating, supporting and cultural services structure, these categories are used in this research as they are widely used in other ecosystem services work such as the UK National Ecosystems Assessment or UK NEA and policy relevant as well as being employed within the NIA indicator framework. Thus, they are used for this research.

2.1.3 Sustainable landscapes

Finally, we bring biodiversity and ecosystem services together to discuss the concept of sustainability and sustainable landscapes. There are various definitions and, often the one selected for use in a situation depends upon the viewpoint or goals of the user; as Fish et al (2014) state “the very assumptions that drive and inform a pattern of land use as ‘optimal’ and link it to a given economic instrument reflect underpinning values, purposes, and aspirations” (p 62). For instance, Callicott and Mumford (1997) suggest that two “conservation-related concepts sprouting from the sustain radical can be immediately identified: (maximum/optimum) sustained yield and sustainable development” (Callicott and Mumford, 1997, p 33). They further suggest that there should be a third “sustain-rooted conservation concept: ecological sustainability” (Callicott and Mumford, 1997, p 33). Sustained yield and sustainable development are associated with ecosystem services or the human use and/or inhabitation of nature. According to them, then, the concept of ecological sustainability should be targeted towards conserving the wild nature of human-inhabited, economically exploited ecosystems (in other words, areas that deliver both conservation and ecosystem service benefits) while concepts like ecological integrity might be more appropriate to guide the conservation of strictly protected areas focused on wild nature conservation to the exclusion of people, for example, places like bio-reserves. This research acknowledges the ecological sustainability viewpoint and the idea proposed by Callicott and Mumford (1997) that ecological sustainability could provide a second, alternative approach to biological conservation, particularly in designated landscapes, which is complementary to the contemporary preservation-oriented approach of protected areas that might discourage human interventions.
Many major initiatives, however, come from the sustainable yield or development perspectives. The UK NEA defines sustainability as ensuring environmental function continues for generations and suggests that this should be achieved through appropriate management to “ensure that ecosystems continue meeting the needs for human well-being” (UK NEA, 2011, Ch 17, p 754). It cites the UK Sustainable Development Commission stating that sustainability is: “‘Living within environmental limits—respecting the limits of our planet’s environment, resources and biodiversity—to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations’ (Defra 2005)” (UK NEA, 2011, Ch 17, p 754). The emphasis here, however, is still the continuation of the function of nature for the benefit of humans, that is the provision of benefits that humans derive from nature, into the future and not necessarily consideration for wild nature in and of itself. There are both benefits and drawbacks to this “commodification of nature” (Robinson, 2011) approach to sustainability. Supporters have contended that conservation of wild nature will be achieved only when the greater part of society recognizes the economic value of biodiversity, which is potentially more of a motivation than the intrinsic value of wild nature. “In line with the ideology of economism, sustainable use is thought to be more likely to be achieved where “an economic value can be attached to a living resource, perverse incentives removed, and costs and benefits internalized” and where “favorable conditions can be created for investment in the conservation and the sustainable use of the resource, thus reducing the risk of resource degradation, depletion, and habitat conversion” (IUCN Sustainable Use Policy Statement, 2000)” (Robinson, 2011, p 961). Conservationists, however, worry that “both sustainability and biodiversity…are at grave risk of being co-opted by people primarily concerned about things other than biological conservation” (Callicott and Mumford, 1997, p 32).

In England, sustainable management is a key concept of the Ecosystems Approach Action Plan noted by the UK NEA and promoted by Defra. This approach is considered to involve a “more holistic and integrated approach based on a consideration of whole ecosystems; it requires that the value of ecosystems and their services is reflected in policy and decision making across Government departments” (UK NEA, 2011, Ch 17, p 754). This shows some balance between a purely conservation-oriented approach and an economic one in that it recognizes the importance of whole ecosystems and not merely ecosystems that function with regard to important services, but it also states that the value of ecosystems should be reflected in policy decisions which implies an economic outlook although this need
not necessarily be monetary in nature. This approach has been adopted as part of numerous initiatives undertaken by various bodies including Natural England (the body overseeing the delivery of the NIA Initiative), the Forestry Commission and the Environment Agency as well as by several projects under the Asset Management Programme or AMP (UK NEA, 2011, Ch 17). The Ecosystems Approach is derived from the CBD which strives for the combined management of terrestrial, aquatic and other biotic resources to encourage conservation in a sustainable and equitable way. The CBD states that “It is based on the application of appropriate scientific methodologies focused on levels of biological organization which encompass the essential processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of ecosystems.” (MA Conceptual Framework, 2005, p 29) The ecosystems approach offers a valuable means to understand the complexity of the human-environment relationship and the many links between people and nature. It acknowledges the dual objectives of biodiversity conservation and ecosystem service delivery while highlighting the impact policy and management choices can play in realising these multiple objectives. The next section examines the different potential relationships between the two objectives of biodiversity conservation and ecosystem service delivery, namely synergistic or trade-off.

2.1.4 Managing for multiple objectives: synergies and trade-offs

When examining potential relationships between biodiversity and ecosystem service delivery, there are multiple ways a synergy or trade-off might occur. There are direct conflicts between resources where, when a resource is used for one purpose, it is then unavailable for another purpose. However, there can be indirect conflicts as well where conducting one activity in an area indirectly impacts the ability of the system to perform another activity or service but there is no specific competition for a resource. The potential for conflicts is made more complex when you consider the impact of management decisions. Whenever an area is managed in some way for conservation or service delivery, there are often specific goals or priorities. Any choices based on these goals or priorities can impact the potential for synergies and trade-offs as well, both between biodiversity conservation and ecosystem service delivery but also between the delivery of different ecosystem services or between goods and services. The complexity of natural systems, however, and the linked ecological, social, physical and economic factors within them, make identifying any generalisations
about synergies or trade-offs difficult to establish based on theory, case studies or in principle (Howe et al, 2014). Nonetheless, general trends between biodiversity and ecosystem service delivery as well as between different types of services are discussed here to provide context.

The UK NEA (2011) has looked in depth at ecosystem goods and service delivery in the UK and its impact on natural systems and wild nature. However, this segment looks at broader trends that have been discussed in the literature with regard to biodiversity and the four types of ecosystem service delivery, with the caveats that these trends cannot be assumed in individual areas or for the different types of services under the broader headings and that trends noted could also change with scale. In general, provisioning services have increased at the cost of the degradation natural environment as well as at the expense of supporting, regulating and cultural services. An increasing population has resulted large-scale changes to almost all ecosystems driven by the need to deliver ecosystem goods and services to an ever-increasing population (Foley et al, 2005). Agricultural and urban areas of land use have expanded world-wide, particularly in recent decades, in conjunction with the increasing consumption of energy, water, and fertilizer; all this has contributed to a substantial loss of biodiversity. The UK NEA (2011) discusses the substantial degradation and loss of wild nature in England and that “The main direct drivers of change primarily affect agriculture, woodland and urban land uses, while indirect ones concern economic forces and increasing population” (Ch 17, p 695). These changes in land use to fuel provisioning services potentially undermine the capacity of ecosystems to sustain natural ecosystem functions, particularly regulating and supporting functions including, but not limited to, forest production, water flow and quality management, carbon sequestration / storage and air quality management (Foley et al, 2005). This trend is true of England as well; the UK NEA (2011) notes that “England’s provisioning services contribute strongly to local and national economies and while environmental management is improving, significant impacts on interdependent regulatory, cultural and supporting services must be addressed” (Ch 17, p 695). That said, land used for provisioning services that is specifically managed to support additional ecosystem services as well could provide a broader range of ecosystem functions and services (Foley et al, 2005).

The next segment specifically looks at the current management of systems and indicators of where a trade-off between services might occur. A recent paper by Howe et al (2014) that conducted a meta-analysis specifically of ecosystem service synergies and trade-offs impacting human well-being identified three key indicators
where a trade-off might result in service delivery. It should be noted that this research did not consider trade-offs between biodiversity and service delivery but between different services. The most significant variable was having a situation which involved a private interest (one party receiving a direct benefit from a provisioning service, for example) in one or more ecosystem services. This is particularly notable when the actor benefitting more has a private interest and the loser has a public interest (such as a social benefit from a regulating service) in either the same or with a competing ecosystem service. Thus, their research indicates that trade-offs that result from management choices frequently arise in situations where there are private pecuniary gains on one hand and wider societal losses on the other (Zhang et al, 2007).

The second indicator was that trade-off situations were more likely to result in situations which involved provisioning service as opposed to a cultural, regulating or supporting service. Furthermore, frequently, the loser in the situation had a broader range of ecosystem service usage or, in other words, made use of other types of services beyond provisioning while the winner normally benefited specifically from the provisioning service. However, different provisioning services also resulted in trade-offs between them; additionally, there were also situations where the other service categories were dominant in a trade-off against provisioning services. This illustrates the importance of local circumstances. The researchers further suggest that there exists a “management incompatibility, or lack of consideration of the wider impacts by those making ecosystem service management/provision decisions” (Howe et al, 2015, p 272), particularly between provisioning and the other services where one suffers from the prioritisation from another although it is not necessarily the provisioning services which always dominate.

Scale is an important consideration as the third indicator was that trade-offs resulted more frequently when one actors, generally the stakeholder who benefits more, is acting at the local scale, perhaps because private interests are more frequently maintained at a local levels (Power, 2010; Zhang et al, 2007). Those losing out generally had a more varied profile with regard to the scale at which they were acting. Additionally, the researchers noted that the number of trade-offs diminished with increasing geographical scale when there was a minimum of one provisioning service involved.

Additionally, while the likelihood of a trade-off occurring diminishes with the absence of a provisioning service, the likelihood of a win-win does not reduce with the presence of a provisioning service. Similarly, the presence of one of the other three
indicators of a trade-off does not necessarily mean that a trade-off is unavoidable. Moreover, differences between the likelihood of a synergy or trade-off are only evident when looking at the ecosystem services in question and their benefits and uses, not when examining stakeholder profiles. Howe et al (2014) suggest that it is down to the managers in individual situations who have circumvented trade-off situations between different ecosystem services to achieve win-wins in practice, particularly by taking into account as many benefits or stakeholders as possible and not operating on the basis that provisioning services should take precedence over any other services. Clearly, the human-environment relationship is very important in conservation implementation and management. It is discussed more broadly in Section 2.3.

2.2 The ecological network: space for nature

The ecological network concept, according to Opdam et al (2006), is a key means for including biodiversity conservation into sustainable landscape development. Sustainable landscape development, as previously mentioned, is “accommodating the needs of the present without compromising the ability of the future generations to meet their needs (World Commission on Environment and Development, 1987; Ahern, 2002,” (Opdam et al, 2006, p 323). Sustainable landscape development must involve ecological planning which is defined by the inclusion of both biophysical and socio-cultural information to inform opportunities and constraints in landscape management.

2.2.1 Defining ecological networks

There are many different definitions of the ecological network concept. Several definitions are discussed here, the important features of each highlighted to indicate where the different definitions overlap or differ and then the ecological network concept employed by this research is stated. The ecological network concept began in the 1970s but did not achieve widespread attention until the 1990s (Bennet and Wit, 2001). Today it is widely used in various initiatives such as the NIA Initiative.

In 2001, the IUCN published a report discussing the development and application of the ecological network framework (Bennett and Wit, 2001). The report notes that many initiatives have used the concept of an ecological network to improve
conservation programs and that all aim to maintain ecological function while using natural resources sustainably. The definition formally employed states that ecological networks are “a coherent system of natural and/or semi-natural landscape elements that is configured and managed with the objective of maintaining or restoring ecological functions as a means to conserve biodiversity while also providing appropriate opportunities for the sustainable use of natural resources” (Bennet and Wit, 2001, p 16). The key features, biodiversity conservation and sustainable use of natural resources, should be achieved by creating a framework that enables ecological functioning of a landscape while also facilitating human use where suitable. This clearly implies more of a conservationist approach as opposed to a preservationist approach as human intervention is a key part of the definition and this aligns with the focus on sustainable use of ecosystem goods and services. This definition helps to set out the features that they identify as common to all the definitions of ecological networks which are:

- “a focus on conserving biodiversity at the ecosystem, landscape or regional scale
- an emphasis on maintaining or strengthening ecological coherence, primarily through providing for ecological interconnectivity
- ensuring that critical areas are buffered from the effects of potentially damaging external activities
- restoring where appropriate degraded ecosystems
- promoting complementarity between land uses and biodiversity conservation objectives, and particularly by exploiting the potential biodiversity value of associated semi-natural landscapes” (Bennet and Wit, 2001, p 16).

The report further notes that ecological networks operate across scales, making it a useful concept for both local and international applications.

The definition of an ecological network according to Opdam et al (2006) is “a set of ecosystems of one type, linked into a spatially coherent system through flows of organisms, and interacting with the landscape matrix in which it is embedded” (Opdam et al, 2006, p 324). They further explain that “a landscape usually contains several ecosystem types” and thus “several types of ecosystem networks” (Opdam et al, 2006, p 324). They also clarify that the term does not refer to the functioning of the network; while an ecological network might have a single objective, or be multiuse, the key emphasis is coherence with regard to ecological processes. Furthermore, an ecological network might potentially have multiple configurations in the landscape as a result of the four key physical components: total area covered by the network and quality as well as the density and permeability of the network which both contribute to the connectivity of the matrix (Opdam et al, 2003). These features allow for the
assessment of the spatial coverage and cohesion of a landscape. Ecological networks operate across scales, and assessment of these for physical components should also occur across scales, particularly as many potential impacts are scale-dependent. This definition, it is worth noting, emphasises that it does not refer to the functioning of the network, in contrast to the previous definition, which does include maintaining or restoring ecological function as a key feature of the ecological network. It also does not specifically reference human intervention or ecosystem services. Instead, ecological cohesion is emphasized. In a sense, this definition of an ecological network almost echoes certain features of a preservationist approach where ecological cohesion is maintained and the natural processes of the system allowed to happen without interference.

Lawton et al (2010), in the report Making Space for Nature which explored the state of England’s wildlife, define the ecological network as “suite of high quality sites which collectively contain the range and area of habitats that species require and ensure that ecological connections exist to allow species, or at least their genes, to move between them” (Lawton et al, 2010, p 14). This concept of the ecological network identifies core sites of high-quality habitat, surrounded by buffer zones to mitigate negative impacts. These core sites are connected by corridors which are small wildlife-rich spots that allow for the permeability of the landscape in order to facilitate movement between the core sites. Additionally, there are restoration zones or areas selected to create new, high quality sites that will ultimately become core areas. Such restoration zones will ideally enhance existing areas. These core sites, restoration zones and corridors sit within a mosaic landscape designed to allow for multiple uses and benefits. To further enhance the concept of multiple benefits, they also identify sustainable use areas which are sites intended to offer multiple benefits for both conservation of wild nature but also ecosystem service delivery. Ideally, these areas improve the permeability of the landscape to wildlife. They identify the key features underlying the ecological network concept as coherence and resilience. A “coherent ecological network is one that has all the necessary elements to achieve its overall objectives…[so that] the value of the whole network is greater than the sum of its parts” (Lawton et al, 2010, p 20). “A resilient ecological network is one that is capable of absorbing resisting or recovering from disturbances or damage caused by natural perturbations and human activities… while continuing to meet its overall objectives of supporting biodiversity and providing ecosystem services” (Lawton et al, 2010, p 20). The researchers also emphasize that ecological networks operate across scales and can be nested. This definition is more similar to that used by the IUCN in that it clearly
involves human interventions but also recognizes ecological function as important although that term is not specifically used. The emphasis on resiliency, the ability to weather a damage or disturbance while still supporting wild nature and providing ecosystem goods and services, essentially describes maintaining ecological function. Figure 2.1 shows the Lawton Report’s (Lawton et al, 2010) representation of an ecological network.

Figure 2.1 A diagram of the features of an ecological network.

The main themes that emerge from these different ideas of what constitutes a protected area or designation are coherence, resilience, and permeability with regard to ecological function across scales, and the potential for multiple, compatible uses of the landscapes with core spaces for wild nature in strictly protected areas complemented by other spaces for the utilisation and delivery of ecosystem services.

2.2.2 Protected areas and designations in England

Protected or designated areas form an important part of the global initiative to conserve wild nature and a key feature of many national strategies to maintain the functioning of natural systems including the UK but there are very different approaches to what should be protected. Dudley (2008) considers protected areas to “act as benchmarks against which we understand human interactions with the natural world” (p 2). They are “complimentary to measures to achieve conservation and sustainable use of biodiversity outside protected areas” (Dudley, 2008, p 2) and potentially in designated landscapes. In addition to their immediate benefits, protected areas also deliver essential space for evolution to occur, facilitating future ecological adaptation or restoration, which is particularly important in the face of increasing environmental change. However, understanding what constitutes a protected area is more complicated.

The term “protected area” is really a catchall for a variety of both terrestrial and aquatic designations, although it should be noted that this research is specifically interested in terrestrial protected areas and thus only terrestrial areas are discussed. Furthermore, the term captures a vast array of management approaches from highly protected sites where wild nature is prioritised and humans excluded to multiple-use areas where both conservation and ecosystem service delivery are encouraged.

A widely used and generally accepted definition for a protected area is that of the International Union for the Conservation of Nature and Natural Resources or IUCN which describes a protected area as:

“An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” (Dudley, 2008, p 4).

The IUCN further classifies protected areas into one of six categories depending upon the management objective, in other words, whether the focus is purely on wild nature conservation (category I) or whether the delivery of ecosystem services is also a
priority (category VI). It should be noted, however, that designation of an area to a specific category does not describe the management effectiveness, merely the original intention of the area.

While protected areas in many places encompass natural and/or almost-natural ecosystems or those systems which are being restored a natural state, not all are. Some areas “document the interplay between human activity and nature in cultural landscapes (Dudley, 2008, p 2). This is true of the UK where many desirable landscapes have been shaped by human interventions. Protected or designated areas can exist across a variety of scales, from small areas to landscape-scale initiatives. Often, the priorities for designated areas vary with the scale, with smaller areas having a greater focus on wild nature conservation potentially to the exclusion of humans, while landscape-scale initiatives address human-environment interactions.

England’s protected area network is extensive and has many different designations, often from different times in history with various management priorities and which frequently overlap. Different analyses of England’s protected area network include different subsets of the many designations when discussing what truly constitutes a protected area, as shown in Figure 2.2.
Figure 2.2 An illustration of three categorisations of protected areas in England; different categorisations include or exclude certain designations depending upon the assessment of what constitutes a true protected area.

Author’s own using data from: The Lawton Report (Lawton et al, 2010); the JNCC website (http://jncc.defra.gov.uk/page-1527, accessed 17/05/2015); Putting Nature on the Map (Crofts et al, 2014).

These varied analyses often consider the level of protection a designation is granted as well as the original purposes of the area.

2.2.3 The impacts of scale: landscape-scale initiatives

Landscape-scale initiatives are an increasingly common approach to conservation (Sayer et al, 2017) and although they are not defined by a specific size and thus vary extensively in area, there are three broad features that characterise them according to Pressey and Bottrill (2009). First, their boundaries can consider or define “patterns and processes of biodiversity” (p 464) as well as the associated social uses, pressures and governance or management approach, thereby ideally providing managers with a range of practicable priorities, restrictions or opportunities. While landscapes inherently involve some heterogeneity with regard to ecology with different types or patches of vegetation, these are unified by a “fundamentally connected background which contains some kind of internal order or logic (Forman and Godron, 1986: Forman, 1995” (Shepherd, 2008, p 2). Next, landscapes are intended to be large enough to deliver a “spatial context for conservation decisions”
(Pressey and Bottrill, 2009, p 464) allowing consideration of such features as complementarity of the overall network, connectivity between individual sites, pressures on natural features and relationships between various ecosystem services. Finally, landscapes are still sufficiently restricted in size so that the areas selected as potential conservation sites are the areas in which actions are ultimately applied.

Landscape-scale conservation initiatives are different from more traditional protected areas in that they acknowledge the larger system that includes humans and wild nature, and the associated multiple functions of biodiversity conservation and ecosystem service delivery. Sayer et al (2017) define the landscape-scale approach as follows: “a long-term collaborative process bringing together diverse stakeholders aiming to achieve a balance between multiple and sometimes conflicting objectives in a landscape or seascape,” (p 466). This definition emphasises the balance of potentially conflicting objectives and the importance of community engagement. However, it is vague with regard to the role the landscape-scale approach can play in improving space for nature, instead focusing on the benefits for people; nonetheless, such initiatives can play a major role in facilitating biodiversity conservation within strict protected areas by improving connectivity, limiting fragmentation and providing essential buffer zones that shield strict reserves from outside pressures or disturbance.

Across scales, diversity in stakeholder type and associated values in wild nature conservation is increasingly being acknowledged, particularly in landscape-scale initiatives. In almost all landscapes, conservation success or otherwise is influenced by management context and those stakeholders driving the approach, which can range from local individuals to international organisations, as well as other social factors or elements not directly situated in the local landscape. These factors are comprised of both the formal elements including management policies, processes and institutions wherever the landscape is situated, but also the tangential local and more remote elements which impact how the landscape interacts with the larger region.

The landscape-scale approach emphasises the idea that it is not sufficient to only take into account areas which are strictly managed for protection of wild nature when planning but that strategies must consider the wider systems including people. Other, neighbouring areas must also be considered, beyond even the immediate buffer zone. The promotion of sustainable interaction between nature and people can be managed most effectively in larger, landscape-scale areas, thus underlining the
importance of the ecosystem approach, which facilitates both a broader conservation management tactic on the ground as well as a consideration of interconnections and the human-environment relationship. Human beings are active ecosystem components and must be considered. Human values are key in achieving sustainable ecosystem management. Under many scenarios, many day-to-day management decisions which direct progress towards effective conservation and, ultimately, sustainability of landscapes are made by local stakeholders. When designing or managing protected areas or designations, it is important to consider the approach employed and how this impacts management strategy.

Sayer et al (2017) provide, what they term, a “generic theory of change for landscape approaches” (p 470) which illustrates the important elements and feedback variables in landscape conservation systems. **Figure 2.3** shows this framework. Sayer et al (2017) identify the theories of change as a useful framework because it “traces the links between an intervention and an ultimate impact and makes the assumptions underpinning prediction of the end result explicit (Brooks et al, 2013; Prinsen and Nijhof, 2015),” (p 469).
Figure 2.3 A general framework for a successful landscape-scale system in the achievement of objectives. The management coalition is the main driver of progress towards objectives while the arrows indicate the direction of travel within the framework. ‘Good governance’ and ‘capacity’ are considered positive feedback variables while the ‘competing claims’ help validate the implementation of the approach. The sustainable use of the landscape, the long-term objective, is external to the framework and is achieved through landscape interventions. The metrics are recommended criteria for assessment and measurement, each of which aligns to the essential practices, namely 1 determination and communication of well-defined objectives, 2 an accepted theory of change, 3 a fair approach for ongoing stakeholder engagement, 4 consideration of important actors and policy processes, 5 governance or management effectiveness, and 6 transparency.


Sayer et al (2017) further state that “Landscape approaches are the most recent in a long series of attempts to achieve multiple outcomes through spatially defined interventions, many of which have fallen out of favor, because their effectiveness could not be demonstrated (Sayer and Campbell 2004),” (p 473. Clearly it is necessary to critically evaluate programs such as the NIA Initiative and contribute to evidence on the effectiveness of interventions and consider how future endeavours might be improved. However, approaches must consider the unique features of landscape-scale programs and adjust accordingly.
2.2.3 The Lawton Report

The impetus behind the NIA Initiative began with the Lawton Report on Making Space for Nature (Lawton et al, 2010) in which it was determined that while England’s protected area system has provided many benefits for wild nature, there was potential to improve the resilience and coherence of the existing ecological network(s). The Report (Lawton et al, 2010) outlined recommendations for Ecological Restoration Zones or ERZs and it was in response to these recommendations that the NIA Initiative was developed.

The basis of the Ecological Restoration Zone was derived largely from the concepts of landscape-scale conservation and the ecological network. Lawton et al (2010) envisioned making space for nature by improving the existing ecological network(s) in England: “Ecological networks have become widely recognised as an effective response to conserve wildlife in environments that have become fragmented by human activities. An ecological network comprises a suite of high-quality sites which collectively contain the diversity and area of habitat that are needed to support species and which have ecological connections between them that enable species, or at least their genes, to move,” (Lawton et al, 2010, p vi).

The ultimate objective, however, was a “step-change” (Lawton et al, 2010, p v) in the current approach to nature conservation. Lawton et al (2010) proposed this step-change as “a new, restorative approach which rebuilds nature and creates a more resilient natural environment for the benefit of wildlife and ourselves,” (p v). Furthermore, this step-change should embrace “large-scale habitat restoration and recreation,” (Lawton et al, 2010, p ii) thus emphasising the value of a landscape-scale approach. This constitutes a shift in emphasis from the preservation of what currently exists to a focus on the restoration and re-creation of ecosystem function to ultimately achieve the re-establishment of ecological systems and processes. This switch in emphasis in turns mirrors the focus from purely biodiversity conservation to the ecosystem goods and services derived from natural systems on which humans depend (Naidoo et al, 2008) and which are, or could be, demanded of most ecosystems (Mace et al, 2012).

To achieve this step-change, community engagement is essential; Lawton et al (2010) state that this step-change is not possible “without society accepting it to be necessary, desirable, and achievable. This will require strong leadership from government and significant improvements in collaboration between local authorities,
local communities, statutory agencies, the voluntary and private sectors, farmers, landowners and other land-managers and individual citizens,” (p ix).

The recommendations of Lawton et al (2010) for ERZs in many ways mirror the recent trends in conservation discussed throughout the beginning of this chapter. Despite this transition towards a landscape-scale approach, there is a dearth of empirical data demonstrating the efficacy of the approach in delivering environmental and social benefits according to a recent review (Reed et al, 2016) despite widespread support for landscape approaches (Sayer et al, 2017). This work seeks to address that gap by providing an empirical assessment of the NIA Initiative.

2.3 Social-ecological systems: the politics of conservation

The human-environment relationship is a complex yet incredibly important concept as this relationship dictates the characteristics of the areas selected for protection or designation and the features of those areas that are prioritised for management (Chan et al, 2006). Often, the goals of protected areas are dictated by the policies that create them. For instance, recall the discussion of synergies and trade-offs between biodiversity and / or ecosystem services discussed in Section 2.1.4 and how services are prioritised. Thus, this work acknowledges the field of political ecology which allows for an understanding of the political dimensions of conservation (Adams and Hutton, 2007, Stott and Sullivan, 2000; Zimmerer and Basset, 2003; Peet and Watts, 2004; Robbins, 2012). Political ecology interprets conservation as a particularly political and social issue which involves challenges between different actors or stakeholders and their participation in the process of defining and implementing policies (Adams and Hutton, 2007; Brechin et al, 2002; Neumann, 1997; Agrawal and Gibson, 1999; Benjaminsen and Svarstad, 2010). Political ecology argues that environmental and social elements are inherently linked, that not only the conservation process, that is the policies and management decisions that drive it, need to be considered a result of political processes but that the way an understanding of natural world is actually formed, framed and communicated by an actor, even if derived from formal scientific exploration, is political (Escobar, 1999). “A ‘critical’ political ecology is an ability to reveal the hidden politics within supposedly neutral elements about ecological causality” (Forsyth, 2003, p 53). To address this, it is imperative to explore the ways in which protected areas / designations are designed and implemented, particularly in the context of England and the United Kingdom where this research is based, and
how this interacts with progress towards achieving the multiple goals of biodiversity conservation and ecosystem service delivery in a sustainable way, namely through the inclusion of the wider community in the conservation process.

2.4 The Nature Improvement Area Initiative and the Collingwood Reports

In 2011, DEFRA published the Natural Environment White Paper (NEWP), the Natural Choice: Securing the Value of Nature (Defra, 2011b). It outlined, for the next 50 years, the government’s ideas for the natural environment and the actions that would be taken to deliver that goal. It emphasized the multiple benefits that might be expected from natural systems, stating that, to achieve this, it is necessary to effectively value the social and economic benefits of a properly functioning natural environment while also acknowledging the intrinsic value of wild nature in order to enhance the environment, economic growth and personal wellbeing. As part of the NEWP (Defra, 2011b), a competition was run to select 12 Nature Improvement Areas to improve England’s ecological networks and provide win-wins for both biodiversity conservation and ecosystem service delivery.

NIAs were designated in 2012 in order to facilitate the creation of connected and resilient landscape-scale ecological networks in England (CEP, 2014a). Each area is overseen by a local partnership which embodies a “shared vision for the natural environment” (NIA 1, p 5) and is envisioned to help deliver a ‘step-change’ in the current approach to nature conservation from merely preservation to multiple- or sustainable-use conservation. The “partnerships of local authorities, local communities and landowners, the private sector and conservation organisations” (CEP, 2014a, p 1 – 2) each received funding from Defra and Natural England. The areas were to provide a number of features:

- “opportunities to establish and improve ecological networks by enlarging, enhancing and connecting existing wildlife sites and creating new sites
- a shared vision for the natural environment among a wide partnership of local people, including statutory and voluntary sectors
- surrounding land that can be better integrated with valued landscapes by restoring wildlife habitats and support natural processes [to] adapt to climate change impacts
- benefits to urban areas and communities, with, where appropriate, ecological networks extending into urban areas
- ‘win-win’ opportunities that offer multiple benefits, such as for:
  - the water environment and Water Framework Directive objectives
• flood and coastal erosion risk management
• the low-carbon economy
• opportunities to inspire people through an enhanced experience of the natural environment” (CEP, 2014).

The NIA management strategy was based around four themes: biodiversity; ecosystem services; social and economic features; and partnership working (Defra, 2011c). These four themes were meant to work in conjunction with other legislation in order to achieve targets outlined in national policy to meet international commitments but, most notably for this research, they are meant to embody ‘win-win’ opportunities for both biodiversity and a variety of ecosystem services.

The NIA Initiative was evaluated in three reports, the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) released following each year during which the Initiative ran between 2012 and 2015. These assessments were largely based on the monitoring and evaluation framework established for the NIA Initiative; a critical analysis of the monitoring system is presented in section 5.3. The Final Monitoring and Evaluation Report (CEP, 2015a) used the framework illustrated in Figure 2.4 for its analyses. The methodological framework and processes of the Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) are broadly discussed here. The weaknesses highlighted are some of the main focuses of this thesis. The outputs as assessed by the Final Monitoring and Evaluation Report form one of the focuses of this thesis and, as such, are presented and discussed in Chapter 6.

![Figure 2.4 The logic model for the NIA evaluation.](Source: Final Monitoring and Evaluation Report (CEP, 2015a, p 13).)
The evaluation was conducted using guidance from the Magenta Book (HM Government, 2011) and employed a logic model to frame the approach. The logic model specifically focused on the connections between the following elements: inputs, processes/activities, outputs, outcomes, and impacts (CEP, 2015a). The framework specifically sought to understand and assess the assumed connections between the individual and amalgamated outcomes of the NIA partnerships with specific consideration for the inputs, activities and processes. Essentially, the approach is described as employing a blend of process and impact evaluation, though with more emphasis on the impact aspect. The evaluation was intended to explore:

1) the processes behind how the NIA partnerships achieved the objectives, specifically the inputs, processes and activities, as well as
2) what, specifically, the NIAs had delivered, particularly with consideration for the four broad categories of objectives, namely biodiversity, ecosystem services, social / economic benefits and contributions to wellbeing, to understand the outputs, outcomes and impact.

The emphasis in the Final Monitoring and Evaluation Report is distinctly on the implementation and outputs; it overlooks the context and planning phases entirely and is limited on outcomes. The Final Monitoring and Evaluation Report (CEP, 2015a) acknowledges this, stating “The evaluation at the end of the grant funded period has therefore had to focus on inputs, processes and outputs, with the outputs and impacts only reported where possible,” (CEP, 2015a, p 13).

To undertake this assessment, the model used both quantitative and qualitative data acquired from a variety of sources according to the Final Monitoring and Evaluation Report (CEP, 2015a) and illustrated in Figure 2.5.
The only interviews conducted were those done with the partnership chairs. Three separate interviews were conducted with this small group throughout the three-year period and all were targeted to specific topics. Those topics are as follows: NIA research activities and innovation (December 2013 – January 2014); partnership working and social, economic and wellbeing benefits (April – May 2014); and the difference being an NIA has made (January – February 2015). These three topics provide little understanding of the design or implementation of the NIA Initiative at local level. Furthermore, engaging with partnership chairs overlooks important local knowledge from those involved with NIA activities on the ground.

Ultimately, of the three approaches intended as a means to assess the NIA Initiative, only one was actually possible; the other two methods lacked sufficiently sensitive data with the Final Monitoring and Evaluation Report (CEP, 2015a) merely stating “Approaches 2 and 3 were experimental and tested whether comparative data on uptake of environmental stewardship options could provide the basis for assessing the difference landscape scale conservation interventions (such as the NIA initiative) have in a particular area. No statistically significant relationships were found between the presence of the NIA partnership and the uptake of environmental stewardship
options, in either the trajectory analysis (Approach 2) or the matched comparison analysis (Approach 3). This was due to the number of confounding factors,” (p 10). What this section illustrates is the many problems with the Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) and the need for a critical and comprehensive assessment of the effectiveness of the entirety of the NIA Initiative.

2.5 Assessing management effectiveness: Concepts and challenges

So how does one explore management effectiveness in a specific initiative? Management effectiveness evaluation seeks to understand how appropriately protected areas or networks are being operated, specifically, how governance is impacting progress towards or achievement of an area's objectives. The evaluation of management effectiveness is realised by the examination of criteria, generally appropriately selected indicators, against the stated objectives. The term management effectiveness emphasises three main ‘themes’ in protected area administration (Hockings et al, 2006):

• design and context issues which encompasses individual sites as well as systems or networks of areas;
• process considerations including the suitability of management approaches and systems;
• progress towards objectives, with consideration for the values embodied.

There are a number of different management effectiveness methodologies which have been developed by a variety of actors from international conservation organizations to individual countries and include assessments for both terrestrial and marine protected areas or MPAs. This work focuses on the IUCN Management Effectiveness framework. The IUCN framework is used by several of the most common management effectiveness methodologies, for example the RAPPAM and the Tracking Tool (Leverington et al, 2010). Furthermore, even methodologies which preceded it mention it in recent publications (Martin and Reiger, 2003: Leverington et al, 2010). The real appeal of the IUCN framework is the consideration of the cycle of management which considers all elements of management: context issues such as values, pressures as well as both internal and external factors that impact management; inputs and processes; and outcomes such as progress toward or achievement of objectives, shifts in values, and influences on the local community.
This is particularly useful as methodologies which emphasise ‘input’ and ‘process’ indicators can overlook some of these elements (Leverington et al, 2010).

The IUCN-WCPA evaluation framework (Hockings et al, 2006) provides a foundation for evaluating systems or networks of protected areas or designations. An evaluation should examine the individual framework elements as well as the connections between them to provide a full understanding of management effectiveness, examining individual areas as well as larger systems of protected areas. Consideration of the context of individual areas is key as each area or system has specific circumstances and requirements, thus the framework should be modified to suit, as is done with the NIA Initiative. The IUCN management effectiveness framework informs the questions which are tailored to the objectives of the NIA Initiative as stated in the Guidance Notes (NIA 1).

Evaluation is also critical for adaptive management (Leverington et al, 2010). Change is a natural part of socio-ecological systems and can impact any or all of the ecological systems, the community, the economy and the governing system of an area. As global change accelerates, it is necessary to critically examine the effectiveness of an area or system strategy for achieving conservation. It is critical that managers understand which ideas or practices are succeeding with regard to the objectives and which are not future strategies can be adapted. Management effectiveness evaluation is an important tool in designing and implementing responsive, practical management strategies. It allows for an array of experiences to inform learning and constant improvement in approach, thus helping to anticipate and respond to future opportunities and pressures.

2.5.1 Qualitative data; the importance of local perceptions

A key feature of management effectiveness is the potential for use of both qualitative and quantitative criteria, indicators and data in the assessment. A criterion is the feature being measured and is characterised by the set of related indicators used to measure it. Progress towards objective is assessed by means of quantitative or qualitative indicators, that is variables which allow for the assessment of trends or status in the achievement of targets (Hockings et al, 2006). While quantitative data can be easily understood and, as a result, is often attractive to policy makers, qualitative data can provide key understanding of the management effectiveness of areas. Bennett (2016) highlights the importance of local perceptions of conservation
management, stating that “studies of the perceptions of local people can provide important insights into observations, understandings and interpretations of the social impacts, and ecological outcomes of conservation; the legitimacy of conservation governance; and the social acceptability of environmental management,” (p 582). Sayer et al (2017) emphasise something similar, specifically saying “Local knowledge, learning, and engagement are fundamental to success and citizen science has a key role in driving this (Sayer et al, 2015),” (p 473). While these comments discuss wider communities, local knowledge is equally as important with regard to local actors as in the NIAs as well. Having acknowledged the importance of qualitative data, the next section explores quantitative assessments of biodiversity and ecosystem service concurrence.

2.5.2 Assessing concurrence: exploring the biodiversity conservation and ecosystem service delivery of an area

Evaluating the provision of biodiversity and ecosystem services in protected areas and assessing the synergies and trade-offs of those spaces recognised for biodiversity conservation and those providing ecosystem services in a landscape area is complex (Naidoo et al, 2008). Trade-offs, however, can result from the delivery of certain ecosystem services, for example water quality and agricultural production, thus making the provision of both in a single area relatively difficult (Anderson et al, 2009; Eigenbrod et al, 2010; Duran et al, 2013). Those services which include intensive management practices often result in the degradation of natural environments, harm to biodiversity and the potential reduction of other types of ecosystem services. While agriculture, for instance, is clearly an important provisioning service (MA, 2005) which delivers a variety of essential goods and services, it is widely acknowledged to negatively impact biodiversity conservation due to the frequently intensive approach to land management (Mascia and Pailler, 2011; Power, 2010). Therefore, the values of the managing body and the resulting management decisions will impact how effective or otherwise a system or network is in embodying various ecosystem services, all of which are impacted by context of the area or system, factors such as the region and local socioeconomic situation (Duran et al, 2013). In an area such as the UK, where the landscape has been moulded throughout history by human activities and ecosystems therefore already impacted by human activities, agriculture might not be considered as detrimental a land use (Eigenbrod et al, 2009). Areas with comparatively intact assemblages,
however, might in contrast exclude agricultural or similarly impactful land uses from protected areas or networks (Soares-Filho et al, 2010; Duran et al, 2013).

There are generally considered to be two broad approaches to spatial assessments of ecosystem services which inform policy decisions (OECD, 2011). The first employs large-scale analyses which consider multiple services to determine a few estimates of service delivery for an area of consideration, perhaps habitat type or region (see examples Costanza et al, 1997; Troy and Wilson, 2006; Turner et al, 2007; Naidoo et al, 2008; Raudsepp-Hearne et al, 2010; Chan et al, 2011). Although simple, this broad-scale approach erroneously assigns every unit of an area the same value – without consideration for features such as the quality of the natural space, rarity or uniqueness of the features, the spatial configuration or connectivity, size, nearness to urban / suburban areas, or socio-economic factors / community values (OECD, 2011). Additionally, although global or larger-scale analysis can inform broad-scale priorities, interventions are generally implemented at local levels and thus smaller-scale assessments could be more appropriate for understanding individual initiatives. Broad-scale approaches also do not allow for analyses of service provision under new conditions. Natural systems are impacted by land use and management practices; a change in management approach will alter the system properties, processes and elements which support service provision, in turn changing delivery for both individual services but also the broader bundle (de Groot et al, 2010). It is essential to understand the land use and management practices and their impact on service delivery to effectively design interventions which produce the desired outcomes (Nelson et al, 2009).

In contrast, under the second approach, researchers specifically examine the delivery of a single service in a small area (OECD, 2011) and the impact of local factors on the delivery of the service of interest (see examples Kaiser and Roumasset, 2002; Ricketts et al, 2004). Although such methods address some weaknesses of the first method, the small-scale approach makes it difficult to apply learning to a wide variety of policy enquiries. Ideally, approaches should embody elements of both the thoroughness of the small-scale approaches and the broader applicability of larger-scale studies (Nelson et al 2009; examples of studies which try to do so: Boody et al, 2005; Jackson et al, 2005; Antle and Stoorvogel, 2006; Chan et al, 2006; Naidoo and Ricketts, 2006; Egoh et al, 2008; and Nelson et al, 2008).

Many studies assessing synergies and trade-offs, also referred to as concordance or concurrence, in biodiversity conservation and ecosystem service delivery have found
that the results are also generally scale dependent. Naidoo et al (2008) looked at concurrence at a global scale assessing ecoregions and then focussed on one area within a specific ecoregion to look at the impact of scale on biodiversity and ecosystem service synergies and trade-offs. They found that, although the California Central Coast ecoregion falls within a ‘win-win’ area in the global analysis, units which encompassed potential win-wins at smaller, local scales comprised less than 25% of the population. By extension, regions identified as trade-offs at larger scales are likely to include areas with win-win opportunities at local scales, particularly when a study includes services which operate over comparatively smaller scales. Overall, they found that there was no difference in ecosystem service delivery between areas selected to maximise biodiversity and areas which were randomly selected.

Larsen et al (2012) examined the concurrence in a protected area system using species at risk of extinction for the biodiversity indicator and four ecosystem service, namely carbon storage, freshwater resource provision, an option value defined as currently unknown benefits from biodiversity conservation and cultural values or services. The study determined that sites selected based on conservation priority also provided better service delivery. While the work mentions the study by Naidoo et al (2008), there was no discussion of the differences in conclusions. Methodological differences might provide some explanation as Larsen et al (2012) used ‘species on the edge of extinction’ as the biodiversity indicator, very different to the indicator used in the previous work. The differences between these two studies highlight the importance of choice of indicator and methodology as there is no single gauge which can accurately and completely encompass the many facets of biodiversity and effectively demonstrate changes for all the various ecosystems and scales given the innate variation and complexity of natural systems.

Anderson et al (2009) examined the concurrence of areas with high levels of biodiversity and areas providing high levels of selected service delivery, namely carbon storage, agricultural land value and recreational use, in Britain. The study examined whether those three services were spatially correlated with species of conservation concern, namely UK Biodiversity Action Plan or BAP species. The results suggested that the relationships were scale dependent as the trends noted at national levels differed when explored at smaller scales and by region. The species indicator likely impacted the results; the study found that in the north-west of the UK, low biodiversity was associated with high carbons storage, but these areas encompass valued habitats of conservation concern. It is also worth noting that the
biodiversity indicator does not provide any information with regard to conservation interventions or action (Eastwood et al, 2013).

Furthermore, it is important to note that studies generally break down the study area into planning units and assess levels or amounts of biodiversity and ecosystem service delivery in each according to study-specific targets rather than examining existing protected areas and assessing delivery against national policy targets. Some work has been done on the effectiveness of protected areas by looking at biodiversity and ecosystem service representation, which is delivery in protected areas as compared with what would be expected of an even distribution of delivery. Such studies have been carried out in different areas (Duran et al, 2013) including the UK (Eigenbrod et al, 2009; Anderson et al, 2009).

Eigenbrod et al (2009) examined the impact of conservation intervention or action and service delivery more directly in England. Their study explored the concurrence of service delivery (carbon storage, agricultural provision and recreation) with three types interventions, namely protected areas, protected landscape or what they term restrictive zoning and incentive payments to landowners such as agri-environment schemes. Essentially, the study assessed the delivery of specific ecosystem services in an area as a proportion of total delivery in England and whether the level was greater or otherwise than would be expected for the spatial area. The results suggest that protected areas provide high levels of biodiversity and deliver high levels of carbon storage, though low levels of recreation and agricultural provision. Similar patterns resulted for restricted zoning areas, but areas classified under the agri-environment scheme heading had no obvious trends in concurrence with regard to biodiversity, carbon storage or agricultural provision. Interestingly, recreation analyses indicated negative trends with all three intervention types. It is interesting that protected areas high in biodiversity are associated with high levels of carbon storage in this study as compared to the Anderson et al (2009) study where carbon storage and biodiversity were negatively associated at the GB scale. A key difference is that Anderson et al (2009) looked at area in general while Eigenbrod was focused on protected areas which represent habitats and large wilderness zones that have large carbon stores (Eigenbrod et al, 2009). The study emphasises, however, that it is unlikely that the concurrence or potential win-win situation noted between biodiversity and carbon storage will always be achievable.

Neither Anderson et al (2009) nor Eigenbrod et al (2009) address Nature Improvement Areas, examine the planning of such landscape designations or
examine the management effectiveness of the landscape designations against their goals or national / internationals targets. Furthermore, they do not look at individual areas within management strategies and compare between those. This research is intended to partially bridge that gap focussing on the planning of the 12 areas, the potential synergies or win-win opportunities between biodiversity conservation and ecosystem service delivery in NIAs and examining the management effectiveness of the areas in the context of the existing ecological networks in England.

Plummer (2009) identified the need for research to examine potential errors in the mapping and spatial assessment of ecosystem services, particularly those representations created using value transfer. A paper by Eigenbrod et al (2010) claims to be the first such study; the results illustrate errors associated with spatial value transfer-based proxies. Essentially, proxy-based estimates of service delivery relying on inputs in the form of coarse and / or categorical data, for example broad vegetation types, are liable to result in inaccurate representations of the true spatial distributions of services. Furthermore, many such approaches used in previous studies rely on estimates of services derived from spatial data collected from outside the study area boundaries or from only a small subset of the focus area itself, resulting in inaccurate distribution data. This can result in weaker correlations when assessing concurrence between ecosystem services and biodiversity when compared to studies which use the mean values of primary data covering the whole of the focus area (Eigenbrod et al, 2010).

In spite of data limitations, concurrence assessments of biodiversity and ecosystem service delivery are useful tools for informing management decisions. Understanding what potential synergies and trade-offs between biodiversity conservation and ecosystem services delivery exist in an area could allow for a better intervention approach and design, thus maximizing benefits. Human health and wellbeing and biodiversity conservation are interconnected; sustainable land management should involve targeted interventions to maximise both current as well as future benefits. To realize this potential, it is necessary to further knowledge by striving for quality ecosystem service quantification and mapping acknowledging existing limitations while striving to include as many elements of as many different services as possible. Better mapping facilitates better exploration and understanding of the diverse ways natural systems and humans interact and how to work towards sustainable solutions for both elements.
2.6 Highlighting the knowledge gaps

The preceding literature review has illustrated that there is a dearth of clarity on the management effectiveness of the NIA Initiative but also a lack of understanding of the effectiveness of landscape approaches in general (Sayer et al, 2017). A good understanding requires, among other things, an consideration of the context of an individual area including interaction with a variety of stakeholders, an appreciation of potential trade-offs between the multiple objectives, an exploration of not only the outputs but the outcomes and why or why not those outcomes were achieved and, finally, an understanding of how the intervention sits in the context of other conservation programs in the area of interest (Sayer et al, 2017). This point is echoed by Fish (2011) who emphasises two points, namely “the need to think ‘holistically’ about how any given project, proposal or plan would impact on service provision and human well-being; and, second, the need to manage ecosystem services in relation to wider stakeholder values, needs and priorities,” (p 673).

The multiple objectives of the NIA Initiative constitute a tall order for any initiative, particularly the multiple objectives of wildlife conservation, ecosystem service delivery and community engagement. In order to consider the provision of multiple objectives within NIA designations, there must first be collaboration and agreement between stakeholders at the local level. This depends in large part on the structure and management of the existing body of stakeholders which is heavily impacted by the management context (Hockings et al, 2006). Jacobs et al (2016) further emphasise this point, stating “more research is needed on tools and methodological approaches for inclusion and engagement of multiple social actors and their multiple values, and lessons should be learned about the effects of these different approaches on the research output and outcomes” (p 217). However, none of the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) explored the existing governance, management strategies or the relationships and their formality in any depth. While the first annual Monitoring and Evaluation Report (CEP, 2013) identified the importance of exploring the context of the existing governance and management strategies, it never built on that intention, stating only that “Exploring these historic partnership and governance aspects in more detail is considered important as context in understanding the relative success and achievements of the NIA partnerships.” (CEP, 2013, p 27). The lack of consideration for management context is an extraordinary oversight which is examined in detail in Chapter 4.
The second major oversight in the three Monitoring and Evaluation reports (CEP, 2013; CEP, 2014a; CEP, 2015a) is the lack of consideration for potential interactions, namely synergies and trade-offs, between the various objectives. In the Final Monitoring and Evaluation Report, (CEP, 2015a) for example, the word ‘trade-off’ is used only once in the entire report on page 83 and not with respect to either biodiversity context or ecosystem service delivery. This is especially egregious given the supposed synergy of multiple objectives, specifically ‘win-win’ situations, were a key feature of the Initiative; however, the word ‘win-win’ is only used twice in the Final Monitoring and Evaluation Report (CEP, 2015a) on pages and 6 and 123 at the beginning and end of the report. It is clear that there is an assumed synergy between biodiversity conservation and ecosystem service delivery but no further exploration, with the report merely stating “Reflecting the integrated approach, all NIA activities related to enhancing or creating habitats or encouraging local people to engage with the natural environment, will have also enhanced ecosystem services,” (CEP, 2015a, p xi). Essentially, the stated outcomes overlook a detailed assessment of this key objective entirely; assessment of this is provided throughout Chapters 5 and 6 in this thesis.

A third, significant problem of the Final Monitoring and Evaluation Report (CEP, 2015a) was to conduct targeted, in-depth interviews only with the partnerships chairs as opposed to those people involved with the on-the-ground management of the areas in question. Local insights might provide key data about the experiences of the stakeholders and people involved in the initiative (Bennet, 2016; Sayer et al, 2015). Although the information collected included survey data from others involved with the Initiative, it does not provide the depth and breadth of data that semi-structured interviews allow for nor the exploration of the experiences specifically important to the participants.

Fourthly, the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) fail to provide an understanding of how the NIA Initiative fits into the larger context of landscape-scale programs in England, neither by exploring the collaboration within, between or outside of the NIA Initiative nor by critically assessing the national leadership of the Initiative. Local insights provide important data regarding collaboration and national leadership. The collaboration and national leadership of the NIA Initiative are examined in Chapter 6.

Finally, the Final Monitoring and Evaluation Report (CEP, 2015a) provides a basic assessment of outputs but a very limited understanding of outcomes, particularly with
regard to the community engagement objectives and the step-change put forth by Lawton et al (2010) and promoted heavily in the NIA Guidance Notes (NIA 1). Furthermore, there is no real understanding of why those outputs which were achieved were successful and why those objectives that were not were unsuccessful. Understanding what worked and why is essential for informing future landscape-scale endeavours. These oversights are addressed in Chapters 5 and 6 of this work.

The last major purpose of this thesis is to contribute to the knowledge gap on the management effectiveness of landscape-scale programs, of which there is a lack in the literature (Sayer et al, 2017). This work hopes to address that knowledge gap by considering the combination of multiple objectives of the NIA Initiative which presents challenges for the conventional measures of impact and employ critical strategies to explore the links between project deliverables, outputs, outcomes, and impacts explicitly to fully examine the landscape approach.

The NIA Initiative emphasises the effective engagement of partners, stakeholders and the wider community in the management of the NIA areas, an important principle which is increasingly seen as essential to the landscape process (Selman, 2009; Bennett, 2016). The engagement of various stakeholders depends on the goals of the participants and the degree to which strict protection measures are emphasized against “the appeal of continuing traditional land management practices, the potential for social learning and environmental education, the scope for management by non-governmental organisations, and the inclusion of public enjoyment as a purpose of designation” (Selman, 2009, p S143). The design, implementation and management of the NIA Initiative at both national and local levels, including the management context, and the Initiative’s achievement of its stated objectives, are the subject of this work and discussed in the analysis Chapter 4, 5, 6 and 7.

2.7 Conclusions

Overall, there remains a need to explore those areas of management effectiveness that the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a), particularly the Final Monitoring and Evaluations Report (CEP, 2015a) have overlooked. The preceding review of key research has emphasised that literature on the NIA Initiative and management effectiveness, including both qualitative and quantitative analyses, requires a thorough understanding of the context, implementation and outputs / outcomes including why those outputs / outcomes were
or were not achieved; the current assessments of the NIA Initiative do not provide this. It is essential to address this oversight. In spite of criticisms, there is now more acknowledgement of the complex and dynamic nature of sustainable social-ecological systems, particularly in the face of global change. Elements from the areas of conservation biology and work social-ecological systems have been brought together in order to explore the challenges of designing, implementing and managing a conservation program and the common pitfalls in achieving the desired multiple objectives. Using methods and information gathered from these sources, this work seeks to address the weaknesses of the existing, limited assessment of the NIA Initiative and examine not only what results were achieved but why those results were achieved.

Having explored the various elements central to this thesis, the following chapter aims to explain the methodology employed to examine the management effectiveness of the NIA Initiative in achieving its stated objectives. In Chapter 1, the decision to explore the NIA Initiative was discussed. Management effectiveness assessments in both theory and practice have been explored in this chapter as well as the inadequacies of the current examination of the NIA Initiative identified; however, a further critical knowledge gap is the lack of many multiple-scale, including landscape-scale, management effectiveness assessments. Research must better elucidate how effective landscape-scale programs are at achieving their stated objectives at multiple scales. It is also important to recognise how local contexts impact the implementation of larger-scale programs in their areas.
3 Research Methodology

The methodology employed to frame, design, collect and analyse the data is discussed in this chapter. The value of mixed methodologies in research on socio-ecological systems has been discussed in earlier chapters. Thus, a framework and methodology are presented to examine the design, implementation, outputs and outcomes of the NIA Initiative using both qualitative as well as quantitative data.

A non-linear or iterative method was followed to use the mixed-methodological approach which brings together elements of both qualitative and quantitative research. This acknowledges the position of several conservation management academics who suggest that a more comprehensive understanding of management effectiveness in a landscape-scale program such as the NIA Initiative should be examined using a variety of approaches that derived from multiple disciplines (Sayer et al, 2017; Mace et al, 2012; Hockings et al, 2006). Consequently, literature on management effectiveness and social-ecological systems as well as that concerning quantifying and mapping biodiversity and ecosystem services are used to develop ideas and methodologies employed for this work. Furthermore, the process is developed with acknowledgement of the socio-ecological context of the individual NIAs in England. The field research was conducted, and data collected between 2014 and 2016 in the individual NIAs to gain better understanding of and insight into study areas.

The chapter is structured as follows:

Section 3.1 introduces the intentions and scope of the work and identifies the key research questions;

Section 3.2 provides the conceptual framework for the study and the key epistemological positions used throughout the research;

Section 3.3 presents the methodological framework, providing information on research design and introducing the value of mixed-methodologies;

Section 3.4 details the data collection including the field research and discusses the procedures used for gathering primary data;

Section 3.5 details the geo-spatial analyses and explores the methodologies used for examining the biophysical features of the 12 NIAs;
Section 3.6 presents the strategy for the analysis of the data as well as its presentation in this work;

Section 3.7 discusses some of the main challenges faced throughout the field work and analysis; and,

Section 3.8 recaps, then concludes the chapter.

3.1 Research purpose and scope

This work is based on the understanding that management effectiveness is complex, non-linear, and multi-disciplinary, resulting from the interaction of biophysical features, ecological systems and social systems within fundamentally dynamic spaces. This work explores the hypothesis that the design, implementation, management and outputs / outcomes of the NIA Initiative would be better understood through the exploration of the human-environmental interactions in which the Initiative is embedded. Furthermore, it is essential to not only understand the impacts of the management context in the design and implementation of the initiative but also the impact in the outputs and outcomes of the Initiative in achieving its stated objectives.

The methodology is developed using the IUCN management effectiveness conceptual framework. The previous two chapters have discussed limitations and gaps in the existing assessment of the NIA Initiative as well as how a lack of recognition of the management context have led to misconceptions and an incomplete understanding of the outputs and outcomes of the NIA Initiative. Through its interdisciplinary approach and foundations in the theories of effective design, implementation and management, a mixed-methodological assessment of the Nature Improvement Initiative will provide an understanding of the successes and limitations of the program in achieving its objectives and enable improvements in future endeavours.

With a focus on both the local and national levels of the NIA Initiative in England, this research examines the multiple benefits derived from the ecological network. The conceptual and methodological framework used in this work considers conservation / restoration of ecological systems as well as the delivery ecosystem services provided by those natural systems and the community engagement in the conservation process. This is critical to examine the potential for win-win situations in
the 12 Nature Improvement Areas but also the potential for trade-offs between different objectives.

3.1.1 Research questions

This work is designed to address four principal research questions (RQs);

**RQ1:** Did the NIA Initiative as the program was originally designed fulfil the Lawton Report’s vision for working towards a “step change” in nature conservation?

**RQ2:** Did the NIA Initiative as the program was implemented and managed at both national and local scales throughout the three-year period meet its own needs towards achieving a “step change” in nature conservation?

**RQ3:** What are the key achievements and drawbacks of the NIA Initiative both locally and nationally and what insight does this provide with regard to the interactions between biodiversity conservation, ecosystem service delivery and community engagement at both local and landscape scales?

**RQ4:** Was the NIA Initiative different to previous programs intended to address weaknesses in the existing ecological network in England and how can the successes and limitations of the NIA Initiative be incorporated into future landscape-scale management programs to promote sustainable land management through continued biodiversity conservation, ecosystem service delivery and community engagement?

These four questions will be explored by means of the following research objectives which enable the researcher to:

- Compare the Lawton Report recommendations and NIA competition criteria, examining the activities keeping in mind the dual mandate of biodiversity conservation and ecosystem service delivery
- Examine the local management and biophysical contexts of the individual NIAs in the context of the program requirements and their impact on the structure and consensus orientation of the partnerships keeping in mind the dual mandate of benefits for wild nature and ecosystem service delivery
- Investigate the implementation of the initiative at national and local levels, examining the competition and selection process, compare the objectives
and targets of the individual NIAs to the NIA activities criteria, examine the eventual national monitoring system and ultimately, assess the effectiveness and efficiency of the areas in implementing national objectives at local scales

- Explore the consideration of win-win scenarios for both biodiversity conservation and ecosystem service delivery throughout the execution of the NIA initiative.
- Examine the impact of the structure and implementation of the initiative on the biodiversity conservation and ecosystem service delivery outcomes (were they inevitable?)
- Understand the implications of this landscape-scale approach for biodiversity conservation and ecosystem service delivery through an investigation of the relationships between wild nature, ecosystem services and land management
- Compare the of the NIA initiative to previous programs with similar aims
- Propose recommendations for future landscape-scale initiatives with regard to the combined focus on biodiversity conservation and ecosystem service delivery in the context of Defra’s 25-year plan

3.1.2 Scope of the research

The scope of the research is focused, thus limiting a potentially broad field of study, by employing a local level, participatory methodology which is specifically focused on the identified objectives of the NIA Initiative and the recommendations of the Lawton Report (Lawton et al, 2010) on which the NIA Initiative was based. Yin (2009) and Stake (1995) emphasise that including boundaries helps avoid common challenges such as including too many features in a case. Key features within the scope of this work are as follows:

The IUCN Management Effectiveness framework: this framework is used to guide the research into the Nature Improvement Area Initiative. This work focuses on the experiences of people directly involved with the on-the-ground administration of the 12 NIAs in England and explores the context of the design and planning of the individual areas, the inputs and processes of the program and the delivery of the national objectives, particularly sustainable land management which encompasses both wild nature conservation and ecosystem service delivery as well as community engagement in the conservation process.
Local level, multi-scale approach: This work examines each of the 12 individual NIA including their local partnerships, their collaboration both with other NIAs and other organizations outside the NIA Initiative as well as the national leadership in order to explore successes and problems with the Initiative across scales. Additional, GIS-based analyses are used where there is information available to provide national context for the individual NIAs. This work seeks to address common criticisms around the gap between local evidence and experiences and scientific evidence. Furthermore, the multi-scale approach which explores local and national elements, will facilitate a comprehensive study with robust results where the data is triangulated where possible.

The multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement: There is an incredibly complex, multi-layered relationship between biodiversity and ecosystem services which was discussed in Chapter 2. Generally, there are two approaches to managing this complex relationship which derive from how biodiversity is viewed; one in which biodiversity is considered an ecosystem service, considered the conservation perspective, and another in which biodiversity and ecosystem services are the same thing, termed the ecosystem services perspective (Mace et al, 2012). Community engagement in the conservation process and the perceptions of biodiversity and ecosystem service delivery impact heavily on the design, implementation and management of a conservation program such as the NIA Initiative. The following sections discuss the conceptual framework as well as the main epistemological decisions made, after which the methodological tactics employed to direct assessments of the concepts are touched on.

3.2 Conceptual framework for analysis

The conceptual framework for this work is derived from the IUCN Management Effectiveness framework, shown in Figure 3.1; this framework is used to address the key research gaps in the Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) of the NIA Initiative (Chapter 2).
Figure 3.1 The conceptual framework of management effectiveness analysis employed in this research.

Source: Adapted by author from the IUCN Framework for management effectiveness (Hockings et al, 2006).

Thus, the implementation of the framework is customised specifically to the situation and context of the Nature Improvement Area Initiative. The six stages of the IUCN Management Effectiveness framework are presented below in Table 3.1. By employing this framework, this work will shed new light on the design, implementation, management and outputs / outcomes of the NIA Initiative and the importance of management context in the process.
Table 3.1 The six stages of the conceptual framework of analysis.

<table>
<thead>
<tr>
<th>Element</th>
<th>Principle of assessment</th>
<th>Elements of evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>Protected or core areas and networks are created to conserve key values and understanding the values along with their importance at varied scales (global, national or local) is essential for management planning as well as evaluation.</td>
<td>The values and significance, threats, external influences and stakeholders and local communities</td>
</tr>
<tr>
<td>Planning</td>
<td>Protected or core areas and networks are established to conserve wild nature so understanding the biophysical and management design features is vital for examining management effectiveness.</td>
<td>The design features of a protected area or a protected area system – the physical, legal and institutional factors.</td>
</tr>
<tr>
<td>Inputs</td>
<td>Input assessments explore the sufficiency of resources – personnel capacity, facilities, data / information, operational capital and equipment – which support effective management.</td>
<td>The resources needed; the extent to which these resources are available; and the efficiency of use of those resources.</td>
</tr>
<tr>
<td>Process</td>
<td>Management process assessments explore the quality of management within a protected area network or site.</td>
<td>The implementation of the management strategy including monitoring and evaluation, communication, staff management and training and governance processes.</td>
</tr>
<tr>
<td>Outputs</td>
<td>An examination of outputs determines if protected area managers and other stakeholders accomplished the stated objectives and targets.</td>
<td>The pre-existing plans, objectives, targets and / or standards that have been established which can then be used to evaluate progress.</td>
</tr>
<tr>
<td>Outcomes</td>
<td>A consideration of outcomes explores the actual results of management actions, particularly whether management is upholding the key values underpinning the establishment of the protected / core area or network.</td>
<td>The achievement of the core values and desired outcomes for the protected area or system.</td>
</tr>
</tbody>
</table>


In the conceptual framework presented in Figure 3.1, there are three broad elements which each are further categorised into two sub-components or stages: Design / planning, Adequacy / appropriateness and Delivery (Hockings et al, 2006). It is challenging to design an assessment which encompasses every single one of the socio-ecological factors that contribute to management effectiveness. As a result of a literature review and assessment of gaps in the NIA Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a), four considerations are expanded on here as they are key to the research presented in this thesis. The first; to capture the various components of the socio-ecological system which contribute to management effectiveness, a mixed-methodological approach which emphasises data triangulation is employed. Secondly, it is important to consider each stage in an assessment of management effectiveness, a key feature of which is management context, a feature of design / planning. Context was entirely overlooked by all three NIA Monitoring and Evaluation Reports (CEP, 2013; CEP 2014a; CEP, 2015a). Thirdly, the Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) do not adequately consider the whether the process of implementation was successful in achieving the original plan and objectives. Finally, the conceptual
framework makes a distinction between outputs, the actual achievements of the intervention, and outcomes, the achievement of more nebulous but nonetheless important goals such as the ‘step-change’ in nature conservation in the NIA Initiative. The Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) emphasise outputs but provide less consideration of outcomes. Thus, the consideration of conservation as a social challenge is expanded upon.

3.2.1 The use of mixed methods

There is a significant amount of discussion in literature on socio-ecological systems around qualitative and quantitative research and the benefits and limitations of both approaches (Alessa et al, 2016). Through time, these debates have progressed to an acknowledgement of mixed-methodological approaches (Ostrom, 2009). This mirrors similar debates in conservation research (Ban et al, 2013; Sandbrook et al, 2013; Mascia et al, 2003). Research questions and practical solutions for sustainable approaches to land use necessitate a methodology which can traverse boundaries upheld by stricter conceptualisations (Reynolds, 2007). This work thus employs a mixed-methods approach, incorporating both qualitative, narrative-driven analyses as well as quantitative, spatial analyses of the individual NIAs and triangulating with available secondary data to examine the management effectiveness of the NIA Initiative at both national and local levels. Sufficiently triangulating both the primary and secondary as well as the quantitative and qualitative data will likely address some of the challenges associated with the individual approaches.

3.2.2 The importance of management context

Context provides essential background data for designing and implementing effective intervention strategies as well as for planning and targeting an effective evaluation towards key elements of management effectiveness. Understanding the context is a vital initial step in the cycle of management effectiveness evaluation (Hockings et al, 2006). Protected areas and designations embody specific values and exploring these values along with their significance at local, national and even global scales is key for the evaluation of interventions and their management strategies. However, it is also necessary to understand the significance of these values in an area, any pressures
which might exist and any external impacts or influences on these values, for example, local communities in which specific stakeholders embody significant sway.

There are some specific features that should be considered when exploring context; these are as follows:

- Values and significance, which includes perceived importance from both the biological as well as the socio-cultural perspectives, often identified through objectives;
- Threats, including both internal and external threats, across scales;
- External influences, which should include influences across scales, from the policy environment at the national level through to the stakeholder relationships at the local level; and
- Stakeholders and local communities, which involves an exploration of what groups or individuals are involved, how they are involved and local people or groups that might be impacted by management decisions.

A consideration of the external influences is key as such factors can impact the success or otherwise of specific interventions or management choices. For example, Sterling et al (2017) found that understanding of governance and social-cultural context plays an important role in all types of stakeholder engagement efforts. Outcomes of interventions or initiatives can only be explored after key values, objectives and/or targets and pressures of the area in question are identified. Context also impacts the inputs of an individual area; the inputs of an area become even more significant when that area is part of a larger program such as the NIA Initiative. Context also impacts inputs’ the literature suggests that the quality of an evaluation is affected by the resources available to an individual area (Hockings et al, 2006), although it should be noted that this is a challenging as well as rather subjective topic. Assessments therefore need to consider the inputs available, examine the impact of context on those inputs and identify gaps and shortfalls.

3.2.3 The differences between planning and the process of implementation

Management planning is an essential element of management effectiveness; this includes suitable, measurable objectives or targets which are underpinned by a sound plan and sufficient resources. A key feature of management planning assessment is an examination of the quality of the plans, namely the scope, the suitability and
measurability of the objectives / targets and their significance in the applied management interventions. The basis of an evaluation of management effectiveness is really rooted in understanding the management plan of the area, particularly key objectives and targets and how these relate to its stated outputs and outcomes (Hockings et al, 2006). Essentially, the targets or benchmarks inform the choice of indicators employed for the evaluation process, generally once the programme or intervention has finished.

An important stage in the evaluation of management effectiveness is therefore to examine the process of implementation and whether it truly facilitates the achievement of the original, desired outcomes of the management plan. This is approached in two ways in this research: first, by whether the NIA Initiative constitutes an adequate response to the original recommendations outlined in the Lawton Report (Lawton et al, 2010), which is addressed in Chapter 4; secondly, by whether the NIA Initiative achieves its own objectives, targets and desired outcomes, as stated in the NIA Guidance Notes (NIA 1), throughout the implementation process, the assessment of which is addressed in Chapters 5 and 6.

### 3.2.4 Conservation as a social challenge

The overall goal of the Lawton Report’s (Lawton et al, 2010) recommendations for Ecological Restoration Zones was a step-change in the current approach to conservation, a shift towards an approach which involved the wider community in the conservation process and altered their understanding of that process to the benefit of nature. This objective of a step-change echoes other calls for acknowledging the importance of community engagement in the conservation process or, in other words, an investment in social capital. Pretty and Smith (2004) suggest that conservation interventions in rural areas consider biodiversity at three levels, namely: farms and their agrobiodiversity, adjacent natural areas in wider landscapes and protected or core areas, similar to the ecological network approach used in Lawton et al (2010). They further suggest that recent interventions have demonstrated that rural communities can adapt or improve their understanding of natural systems as well as human-nature interactions or relationships in concurrence with the development of new societal guidelines, norms and institutions, a process which is very similar to the step-change that Lawton et al (2010) envisioned. Furthermore, this approach might facilitate the dispersal of new concepts and positive outcomes for nature to larger
areas. Finally, Pretty and Smith (2004) suggest that social capital facilitates the dispersal of novel concepts or approaches more rapidly.

There are, however, criticisms of this community-based conservation approach. Outcomes have varied significantly, and results have often been poorer than expected (Balint, 2006; Kellert et al, 2000; Barrett et al, 2001). This has, in turn, led to a variety of discussions in the body of literature around conservation over the advantages of community-based conservation (Agrawal and Gibson, 1999) and to critical evaluation from various, differing perspectives (Redford and Sanderson, 2000; Brosius and Russell, 2003). Two positions have emerged (Berkes, 2004). One suggests that the failure of community conservation is a result of its improper implementation, especially with regard to the devolution of authority and responsibility (Songorwa 1999; Murphree 2002) and not due to the weakness or impracticality of the concept. The second holds that the conservation and development objectives, though both important, should be “delinked because the mixed objective does not serve either objective well (Redford and Sanderson 2000)” (Berkes, 2004, p 621). This work addresses the first position by critically examining the implementation of the NIA Initiative. The second position is beyond the scope of this work although it is touched upon in Chapter 7.

3.3 Methodological framework

In practical terms, the main contributions of this research are an exploration of the design, implementation, management and outputs / outcomes of the NIA Initiative and its achievement of the stated objectives, both the Lawton Report’s (Lawton et al, 2010), whence derived the recommendations on which the program was originally based, and the Initiative’s own goals. An important feature of the NIA Initiative’s objectives is the emphasis placed on potential win-win scenarios between biodiversity conservation and ecosystem service delivery in the NIAs and management strategies for achieving these win-win scenarios. Assessing the management effectiveness of a program such as the NIA Initiative is a challenging task and this section will focus on the broad approach used to design the research approach, collect the data and perform the analyses for. The data and analyses for this thesis take two forms, namely the semi-structured interviews and primary literature from the NIAs as well as GIS-based spatial analyses of biophysical features in the 12 NIA areas. To meet the aims of this study, two assessment methodologies are employed:
1. A qualitative, narrative-driven approach to understand the context, planning, inputs and processes of the NIA initiative and examine how the individual NIAs adapt national management objectives for multiple objectives to local circumstances; and

2. A quantitative, geo-spatial approach to consider the biophysical features of the NIAs including:

   a. A connectivity assessment to examine the contribution of the NIAs to the connectivity of England’s ecological network;
   b. A buffer assessment to examine the potential buffering potential of the NIAs for the smaller protected areas within them; and,
   c. A concurrence assessment to examine the potential synergies and trade-offs between wild nature conservation and specific ecosystem services in the NIAs. The concurrence assessment uses indicators employed by the NIAs and other work done by the UK government.

By combining elements from each of the two methodologies, the strengths of both approaches are used to examine the achievement or otherwise of the multiple objectives of the NIA Initiative and identify the potential win-wins for both biodiversity conservation and ecosystem service delivery as well as management strategies that help promote such opportunities. The following sections present each methodological approach in turn; Section 3.4 discusses the qualitative, field research design while Section 3.5 discusses the design of the quantitative, geo-spatial based analyses.

3.4 Data collection

The data collected during the fieldwork included 12 semi-structured interviews with people (sometimes individually, sometimes together) involved with the on-the-ground administration of the NIA initiative and 2 at the national level along with numerous discussions / conversations. A recording device was used to capture the semi-structured interviews, but handwritten notes were also taken and summarised following the interviews. Ethics approval was sought and deemed not necessary as the interview subjects were competent, consenting adults discussing a national program funded by public bodies; nonetheless, oral and written permission to conduct and record the interviews was obtained in all cases. The data were anonymised and
transcribed by a third party; a Confidentiality form was signed by the third party prior to the transcription being undertaken. All interview data is kept in accordance with data protection regulations. The details of the data used in this research are detailed in the following sections.

3.4.1 Primary and secondary NIA document data

Secondary data about the NIAs was also acquired prior to, during and after the fieldwork. This data includes published reports and other data regarding the NIA initiative as well as primary document data such as the 2nd Stage Business Plans for each of the 12 areas which were produced as part of the original competition to take part in the NIA initiative. Some, though not all, of these reports are publicly available. The others were sourced through personal contacts in each of the NIA partnerships. All primary and secondary document data about the NIAs used in this work are detailed in Table 3.2.
Table 3.2 Primary and secondary document data about the NIAs used in this research.

<table>
<thead>
<tr>
<th>Document</th>
<th>Citation</th>
<th>Reference</th>
</tr>
</thead>
</table>
3.4.2 Conducting the interviews

One of the most frequently used methods in qualitative research is the interview (Warren and Karner, 2009). The researcher visited all by two of the areas to conduct semi-structured interviews with the NIAs by means of a questionnaire that was

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Compiled by author.
developed following a comprehensive review of secondary literature about the NIA Initiative and identification of gaps in that literature. An open-ended, semi-structured interview format was decided on for this work in order to facilitate discussions with participants, gain their trust and open up the dialogue to ensure understanding of their perspectives. To that end, the questionnaire provided a framework, but the approach was fluid allowing a natural flow of conversation. The format enabled collection of information about their perceptions of the national design, implementation, management and outcomes of the NIA Initiative as well as an understanding of the local implementation emphases and priorities. The questionnaire also sought to gain insight into the involvement of the partnerships in other, various conservation initiatives as well as the participants’ views on the interaction of the NIA Initiative with other programs and how the NIA Initiative fit within the larger framework of conservation approaches in England. Furthermore, the use of open-ended queries allowed for insight into their understanding of the NIA Initiative and its impact in shaping their local objectives and priorities.

The questionnaire for the NIAs followed a uniform structure and is included in the Appendices. At the outset of an interview, oral permission was first established to conduct and record the interview, then the research topic was broadly introduced. However, specific terms were avoided in order to limit any bias in the work. For example, the terms ‘biodiversity’ or ‘ecosystem services’ were avoided so that respondents could provide unbiased data on their perceptions of the design, implementation, management, outputs and outcomes at both national and local levels. The follow-up questions were developed so as to be flexible and thus allow for an exploration of relevant topics or issues as led by the respondent. The interviews varied in length, but were, on average, two hours long. The interview responses are signposted throughout this thesis by being presented in italics and using randomly assigned Roman numerals to refer to the individual NIA.

3.4.3 Informal conversations and observations

Informal interactions along with observations during the site visits provided useful insights throughout the fieldwork and interactions with members of public bodies. This encompassed informal conversations with analysts and policy makers in England, who generally preferred exchanging information informally. These discussions helped gain a more comprehensive picture of the situational context, the work and potential
challenges in the field. Observations were recorded through field notes and allowed for triangulation of data gathered by means of other techniques as well as to consider discrepancies amongst various sources of information.

3.4.4 GIS-data acquisition and analyses

GIS analyses were, as previously discussed, also conducted to provide national context on buffering, connectivity, land use, biodiversity and ecosystem service delivery in the 12 NIAs. The geospatial data used was primarily downloaded from UK government databases but also obtained from other sources as necessary. The specific origin of each geo-spatial data set used in the analyses is discussed in Chapters 4 and 5; however, the general sources are provided here.

a) MAGIC Database: https://magic.defra.gov.uk/Dataset_Download_Summary.htm, now data.gov.uk
b) NBN Database: https://registry.nbnatlas.org/datasets

3.5 The GIS-based research

A broad overview of the steps followed in developing the quantitative, biophysical analyses are discussed here. Figure 3.2 shows this process. Details of the specific indicators selected as well as the rationale for their selection can be found in Chapter Five, which includes a comprehensive analysis of potential synergies and trade-offs between biodiversity conservation and ecosystem service delivery in the literature as

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well as in England’s ecological network. When considering the spatial assessment of biodiversity and ecosystem service features, three important considerations become apparent in existing research; the scale of the analysis, the methodology or indicators used and data availability and reliability. Data was discussed previously in Section 3.4. This section deals specifically with the process of the analyses.

Figure 3.2 Typical steps followed in the mapping of biodiversity and ecosystem services

![Diagram of typical steps](image)

Created by author with data from literature on mapping biodiversity and ecosystem services (e.g. Costanza et al, 1997; Troy and Wilson, 2006; Turner et al, 2007; Naidoo et al, 2008; Raudsepp-Hearne et al, 2010; Chan et al, 2011).

3.5.1 Consideration of scale

In order to better establish the potential for synergies or trade-offs between biodiversity conservation and ecosystem service delivery, context is required; a value of a specific feature means nothing without an understanding of whether it is higher or lower in comparison to other areas. Thus, two additional protected landscape designations are also included in the assessment in order to better illustrate potential synergies or trade-offs as well as provide context for the 12 NIAs. These two designations are AONBs and NPs.

In the connectivity analysis, a number of small protected area designations are also considered. This work restricts core protected areas to six designations: Sites of Special Scientific Interest or SSSIs; Biosphere Reserves or BRs; Ramsar Sites; National Nature Reserves or NNRs; Local Nature Reserves or LNRs; and Limestone Pavement Orders or LPOs. The analysis includes those six designations as they are largely in line with those considered by Lawton et al (2010) in the Making Space for Nature Report, the recommendations of which informed the NIA Initiative. Special Protection Areas or SPAs and Special Areas of Conservation or SACs are not included in this analysis, though the two designations are covered by Lawton et al (2010) because all SPAs and SACs are also designated as SSSIs. The analysis here
also includes two other designations not discussed by Lawton et al (2010); Biosphere Reserves and Limestone Pavement Orders. These two designations were included as 1) Limestone Pavement Orders are a priority habitat in the UK and priority habitats are a focus of the NIA Initiative and 2) one of the NIAs is also a Biosphere Reserve. Thus, the two designations were considered to be of relevance to the NIA Initiative and any exploration of the areas. Finally, the Woodland / Forest Park designation did not have an available GIS data set at the time of analysis.

3.5.2 Identification of key features

Both the Lawton Report (Lawton et al, 2010) and the NIA Guidance Notes (NIA 1) identified certain ecosystem services of interest; the NIA Guidance Notes (NIA 1), in fact, largely drew on the endorsements of the Lawton Report (Lawton et al, 2010) when emphasising certain services. Thus, those services specifically mentioned are the ecosystem services that are focused on in this work; these services, in no particular order are: recreation, water quality, flooding and carbon storage. Agriculture and urban areas are also included as, although neither are specifically listed as ecosystem services, both are identified in the NIA Guidance Notes (NIA 1) as areas of focus.

3.5.3 Selection of indicators

Biodiversity is an incredibly complex concept as are many of the ecosystem services considered here; as a result, measurements are generally conducted using proxy indicators in order to characterise the feature being examined. Indicators were selected by critically examining previous assessments (for example, (e.g. Costanza et al, 1997; Troy and Wilson, 2006; Turner et al, 2007; Naidoo et al, 2008; Raudsepp-Hearne et al, 2010; Chan et al, 2011), including those specifically focusing on England (such as UK NEA, 2011; Eigenbrod et al, 2009; Anderson et al, 2009) and considering the available data. It was essential to select indicators of relevance to the feature of interest as well as the ecological, social, political and economic context of the study area.
3.5.4 Quantification and aggregation of indicators

The purpose of this analysis was to compare a feature of interest between different NIAs as well as between different designations, namely the 32 Areas of Outstanding Beauty and the 10 National Parks on the mainland of England. However, each of these areas is a different size. To address this, a planning unit of 1-kilometer by 1-kilometre is used for each analysis. This allows for the determination of an average value of the feature of interest per square kilometre in the area of interest. To establish what square kilometres would be considered to be part of the area in question, an analysis was conducted to determine the most accurate representation of the size of the area were, for example, all squares for which the area was 10% or more covered by the designation included in the analysis. This analysis was run for the all values in 10% increments between 0 and 100%. For this work, grid squares were considered to be within a landscape designation when 50% or more of the grid square was covered by the designation. The 50% cut-off was chosen for the landscape designations because the calculated area of the designations matched best with the actual area of the designations. Table 3.3 illustrates this process.

### Table 3.3

A table illustrating the assessment of grid squares considered to be within a designation or not; the percentage which resulted in a total area closest to that of the actual area of the 12 NIAs was chosen, in this case 50%.

<table>
<thead>
<tr>
<th>%</th>
<th>Estimated NIA Area (ha)</th>
<th>Actual NIA Area (ha)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>5,883</td>
<td>5,131</td>
<td>752</td>
</tr>
<tr>
<td>40</td>
<td>5,597</td>
<td>5,131</td>
<td>466</td>
</tr>
<tr>
<td>50</td>
<td>5,143</td>
<td>5,131</td>
<td>12</td>
</tr>
<tr>
<td>60</td>
<td>4,904</td>
<td>5,131</td>
<td>-227</td>
</tr>
<tr>
<td>80</td>
<td>4,368</td>
<td>5,131</td>
<td>-763</td>
</tr>
</tbody>
</table>

Source: created by author from own analyses.

3.5.5 Buffer analysis

Buffering potential was identified in the NIA objectives as a key feature of the areas (NIA 1), thus it is considered as part of the analysis of the biophysical features of the NIAs. There is no specific guideline for the size of a buffer zone (Carvalho Perelló et al, 2012); thus, the most appropriate design is considered to be an area of sufficient
size to protect a core site from the specific threats to that site where possible (Carvalheiro et al, 2011). Although buffer zone design is species and threat specific (Schwartz, 1999), the guiding principle is that any type of buffer zone is better than not having one at all (Diamond 1975). The challenge is with competing land uses as the expansion of surrounding, competing land-uses, such as agricultural/horticultural or built-up areas, can impact the core site; for example, populations of target species can be negatively impacted habitat loss, poor connectivity of sites for dispersal and edge-effects (Treves, 2009), all of which can be mitigated by suitable buffer zones (Watson et al, 2013; Wegmann et al, 2014). When considering buffer zones in the context of the NIAs, the NIA area itself was considered to be a buffer zone for the core sites of designated areas within it. The 1-kilometre buffer zone surrounding the NIA was comparatively arbitrary and largely used for indicative purposes as the emphasis is on the core sites within the NIAs; thus, the NIAs themselves are considered buffer zones between the core sites and the 1-kilometre area surrounding the NIAs. The buffer analysis is discussed in detail in Section 5.4.1.

3.5.6 Connectivity analysis

Connectivity is also mentioned in the NIA objectives as a key feature of the areas (NIA 1) and so it is considered in the examination of the NIAs and their contribution to England’s ecological network. The proximity and connectivity of designated areas to one another affects species representation and persistence; greater connectivity facilitates the dispersal of individuals between areas, thus reducing the likelihood of the loss of genetic diversity due to inbreeding (Hanski, 1998). Given the rapid expansion of anthropogenic land use worldwide, it is critical to maintain species dispersal within ecological networks, and therefore exploring the connectivity and planning of the ecological network is important (Williams et al, 2005). Many studies evaluating the effects of spatial features on protected area effectiveness are based on theoretical approaches (Possingham et al, 2000; McDonnell et al, 2002; Williams, 2008), or on empirical cases restricted to small geographical scales; this study considers aspects of both approaches. The connectivity analysis is discussed in detail in Section 5.4.2.
3.5.7 Concurrence assessment

A concurrence assessment is an assessment of the ‘amount’ of, in this case, both biodiversity and an ecosystem service in a specific area. The term ‘amount’ is used with caution because these indicators merely provide an estimate of one aspect of the feature of interest; no single indicator can truly provide a means to measure such complex concepts as biodiversity. The squares within each, individual designation are averaged and a single value determined; these are then graphed on scatter plots to assess for correlations indicating potential synergies or trade-offs between two features. A “synergy” refers to a positive spatial pattern between a biodiversity indicator and an ecosystem service indicator suggesting that enhanced biodiversity conservation would also likely result in the improved delivery of the service in question. In contrast, a trade-off refers to a negative spatial pattern between a biodiversity indicator and an ecosystem service indicator thus suggesting that enhanced biodiversity conservation would potentially result in a decrease in the delivery of the specified service or vice versa.

The use of all three landscape designations, NIAs, AONBs and NPs, within the analysis is intended to enrich findings, ensuring accurate, landscape-scale results on the potential synergies and trade-offs between biodiversity and certain ecosystem services in England are described. The two scales of assessment are:

I. Designation-level: NIAs were chosen for the dual purposes of benefitting both people and wildlife through the improvement of natural spaces while AONBs and NPs are selected for their landscape character but with the statutory goal of protecting wild nature.

II. Individual landscape area: there are twelve NIAs, all with different management contexts, biophysical features and objectives and targets.

The concurrence assessment is discussed in detail in Section 5.5.

3.6 Data analysis and writing up

Triangulation of data is used to assist with the exploration of the NIAs which employs diverse, mixed methodologies as well as primary and secondary data to bolster conclusions. Triangulation “involves using several methodologies to reveal multiple aspects of a single empirical reality, a discovery process designed to get at an
objective truth that may be systematised as a formal theory of social structure and process,” (Miller and Fox, 2004, p 35). Triangulation of data is helpful for addressing differences or conflicts in data gathered employing a mixed-methods approach. After the data was collected, it was coded, analysed and organised in a way that best communicated the evidence. The following segments provide a brief illustration of the data analysis and communication in this thesis.

3.6.1 Examining copious amounts of complex information

Two different approaches were used to analyse the primary, semi-structured interview data. Firstly, an Excel spreadsheet was used to record structured data about the features of the 12 NIAs, including data from the interviews, the biophysical data and the secondary data. Secondly, qualitative data was coded, as per usual qualitative research protocols (Cope, 2010). Employing inductive reasoning, data and ideas from each, individual interview were identified and linked to a theme using constructs identified as part of the initial review of the secondary literature as well as from emerging patterns within the interview data. These included themes such as ‘Partnership structure’, ‘Participation’, ‘Strategic vision’, ‘Selection of area’, ‘Bid process’, ‘Motivations’ and ‘Management strategy’. Coding was done manually using both the transcriptions and field notes, following which individual themes were described and visually categorised. Both quantitative and qualitative data were coded to facilitate the combination approach and analysis.

3.6.2 Analysis and presentation

The conceptual framework was used to inform data analysis by basing the approach on the stages of management effectiveness (see Figure 3.1). The six stages correspond with the four research questions identified previously in Section 3.1 of this chapter and presented in Chapters 4, 5, 6 and 7. They are described in Table 3.4.
Table 3.4 Structure of the analysis and presentation of the results.

<table>
<thead>
<tr>
<th>Aim of analysis</th>
<th>Analysis</th>
<th>Data</th>
<th>Results chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1 Examine the design of the NIA Initiative and whether the Initiative embodies the key recommendations for the ERZs</td>
<td>Document analysis of the Lawton Report (Lawton et al, 2010) and the NIA Guidance Notes (NIA 1) and Criteria (NIA 2) and Local NIA perspectives and empirical evidence on the design of the NIA Initiative. Examination of biophysical features of the NIAs</td>
<td>Primary data &amp; Secondary data</td>
<td>Chapter 4</td>
</tr>
<tr>
<td>RQ2 Examine the implementation of the NIA Initiative and its achievement of its design objectives</td>
<td>Document analysis of business plans and Local NIA perspectives and empirical evidence on implementation of the NIA Initiative and Analysis of implementation of NIA Initiative in Collingwood Reports (CEP, 2013; CEP, 2014; CEP, 2015)</td>
<td>Primary data</td>
<td>Chapter 5</td>
</tr>
<tr>
<td>RQ3 Examine the outputs of the NIA Initiative and its achievement of its objectives</td>
<td>Analysis of outputs and outcomes of NIA Initiative in Collingwood Reports (CEP, 2013; CEP, 2014; CEP, 2015) and Local NIA Perspectives on outputs and outcomes</td>
<td>Secondary data</td>
<td>Chapter 6</td>
</tr>
<tr>
<td>RQ4 Develop context specific findings to aid in planning improved landscape-scale conservation programmes</td>
<td>Analysis of information from RQ1, RQ2 and RQ3 to develop specific recommendations for future programmes based on the successes and failures of the NIA Initiative</td>
<td>Primary data &amp; Secondary data</td>
<td>Chapter 7</td>
</tr>
</tbody>
</table>

Source: created by author.

3.6.3 Reporting results

Outcomes, when discussing results, are normally communicated in relative as opposed to absolute terms. This is particularly true for the quantitative results presented in Chapter 5 regarding the connectivity, buffering and synergistic potential (for biodiversity conservation and ecosystem service delivery) of the NIAs. For example, one NIA potentially exhibits more opportunity for synergistic situations at a landscape scale than another. This acknowledges that the intention of this work is not to deliver definite, statistically significant outputs, but to explore the different management strategies associated with the implementation of the NIA Initiative at both national and local levels and the central theme of synergies and trade-offs in landscape-scale management. Thus, where quantification is feasible, results are
communicated numerically, for example x out of 12 NIAs discussed water quality in their management strategies. However, results are presented in relative terms where quantification is not possible or impractical (Joakim, 2013). These terms are presented here to clarify the approach to how non-specific results are discussed.

(i) ‘few’ refers to a small number (3 or less, also 25% or less) of respondents;
(ii) ‘some’ refers to when the number of respondents was not known or not quantified, for instance in situations where the discussion is not relevant to all NIAs;
(iii) ‘a number of’, ‘many’ or ‘several’ refers to where more than three NIAs were in agreement, but fewer than nine (or 75%). Often, these were responses noted to occur consistently across various NIAs but expressed in different ways;
(iv) ‘most’ refers to nine (75%) or more of the NIAs.

3.7 Notes from the field

In any fieldwork undertaken, the setting varies with regard to geographical, political and cultural elements. Wherever the situation, there are likely to be challenges such as negotiating trying or dangerous circumstances to overseeing the difficulty of collecting data in varied situations (Tomei, 2014). A number of difficulties were expected in the field which included ethical, methodological and logistical challenges. This section addresses those challenges.

3.7.1 Research ethics

It is essential that a researcher is aware of ethical considerations and issues; in this case, there were minimal ethics considerations as the participants were capable, consenting adults discussing a public program, although with potentially controversial personal opinions. As a general rule, any data collected was gathered, as previously discussed, with written and oral consent from the participants; furthermore, respondents were asked to provide only data which they were comfortable sharing and could request that certain responses be treated cautiously or kept private at any time throughout the process. The researcher communicated prior to the start of the
interview that a respondent’s personal information would not be recorded, made public or shared and that the work was strictly for research purposes only.

3.7.2 Connecting with people: Continuity within the NIAs

This research was particularly interested in the experiences of the people directly involved with the on-the-ground implementation and management of the NIA Initiative. One of the key oversights of the Final Monitoring and Evaluation Report (CEP, 2015a) was that it only conducted in-depth interviews with the Partnerships Chairs, not those involved with the day-to-day running of the Initiative in their local areas. However, the structure and implementation of the program resulted in some difficulties in accessing the managers as many NIAs experienced a high turnover of personnel. Staff retention difficulties were experienced throughout the three-year funded period of the NIAs. However, the end of the funded period of the program particularly brought about the loss of staff for many NIAs (CEP, 2015a). For example, “In Northern Devon, at the end of the grant funded period all NIA employed staff, except the project manager chose to move to new projects,” (CEP, 2015a, p 52). The field work for this thesis took place over the course of about 16 months from November 2015 through March 2017; thus, the end of the program and associated staffing changes proved challenging in some cases. Nonetheless, at least one representative was interviewed for each NIA.

3.7.3 “Why would an American be interested in the NIAs?”: As a non-British researcher

This research relies heavily on locally derived perceptions and information. In order to access that information, the respondents had to trust me with potentially controversial opinions. My status as an outsider (as I am originally American and have an American accent) resulted in both questions regarding my interest in the Initiative but also in an understanding of a shared passion and foundation from which to start the interviews. This largely resulted from what the NIAs perceived as my genuine interest in the obscure subject matter specific to England; why else would an American travel so far to discuss their thoughts on a little-known program? However, it also required that I be aware, as a researcher, of my own preconceptions, both as a scientist but also as a person raised in another society with a different approach to
conservation. For example, a paper by Bills and Gross (2005) noted differences between American and UK stakeholders’ perceptions of approaches to managing agricultural landscapes where the UK group emphasised a shared positive vision for the landscape which was in contrast to the American group.

Throughout fieldwork, it is essential that the researcher reflect on the research and their place in it, as it allows a researcher to critique their approach and facilitates thoughtful, deliberate action (Pio and Singh, 2016). Denscombe (1998, p 208) emphasises that “the researcher plays a significant role in the production and interpretation of qualitative data”. This is often termed reflexivity in qualitative research, a tool with which the researcher can turn the focus of the process inward to critically assess progress (Freshwater and Rolfe, 2001). Throughout this work, I endeavoured to be aware of my position, as well as whether and how I was impacting on it. This was more easily done as the fieldwork was spread out and interspersed by other aspects of research. This process enabled me to challenge myself to think critically about the process and remain “open to new theoretical and practical possibilities” while in the field (Freshwater and Rolfe, 2001, p 534).

3.7.4 “They’ll be frank to you,”: As someone outside the NIA Initiative

Another feature of my being American was that it further emphasised my distance from official sources; I was not, in any way, associated with the public bodies overseeing the Initiative. I also had a different frame of reference; my interest was the design, implementation and management as well as the outputs and outcomes, not merely the perceived successes or failures of the individual NIAs. As a result, the respondents were generally very comfortable being quite frank about their thoughts. As one NIA stated, “I think the problem is with our… You know, they have these conferences…that we speak at, and everyone will want to… Nobody’s going to want to speak negatively about their area they’re coming from…So, it’s very difficult to get an honest appraisal, in a way, isn’t it? They’ll be frank to you now, but if…I had [attended specific NIA conference], I wouldn’t have said anything because, you know, what is the point, in front of a load of people saying…? It sounds really negative, as much as anything, doesn’t it, and there are lots of positives out there. Yes, it’s not just that somebody won’t say anything. Some people are really… You know, for the right reasons, will be really trying to impress,” (NIA i). Essentially, my perceived ‘otherness’
was advantageous in encouraging the respondents to open up about their honest opinions.

### 3.8 Conclusions

This chapter has presented how mixed-methodological approaches were employed to develop an assessment of the design, implementation, management, outputs and outcomes of the NIA Initiative. Interviews with NIA managers were used to focus on local factors and coupled with quantitative, spatial data and secondary data to examine the local and national context for the research questions. The approaches outlined emphasise the use of data triangulation where possible to help provide a comprehensive exploration and understanding of management effectiveness to achieve multiple objectives in conservation. The chapter further addressed the issues posed with regard to ethical considerations and an understanding of the varied local opinions and perceptions of different participants. The following chapters address the findings with regard to each of the four research questions using the methodologies discussed here.
4 The Development of the Nature Improvement Area Initiative: ERZs and the NIAs

The focus of this chapter is to examine whether the NIA Initiative, as the program was originally designed, addresses the Lawton Report’s vision for working towards a “step-change” (Lawton et al, 2010, p 68) in nature conservation. This analysis pays particular attention to the idea of “win-win” (Lawton et al, 2010, p ix) or synergistic situations for both wild nature conservation and ecosystem service delivery. Such win-win situations are an important issue with ever-increasing demand for land resources, particularly with regard to agricultural production and space for a continually rising population to live (Foresight Land Use Futures 2010; Lawton et al, 2010); Lawton’s recommendations in the report titled “Making Space for Nature” (Lawton et al, 2010) for the development of Ecological Restoration Zones present a step towards addressing this challenge. However, little consideration has been given to whether the NIA Initiative as a program embodies those recommendations or how the design coupled with the management and biophysical contexts of the NIAs impacted the NIA implementation of the Initiative which is discussed in Chapter 5. Recent work (for example, the 25 Year Environment Plan, Defra, 2018b) on developing future plans for the wild nature of England make this work necessary in order to provide essential data for prospective endeavours.

This chapter addresses research question one: Did the NIA initiative, as the program was originally designed, address the Lawton Report’s vision for working towards a “step change” in nature conservation? A “step-change” in nature conservation is defined here as a shift in the current “approach to wildlife conservation, from trying to hang on to what we have, to one of large-scale habitat restoration and recreation, under-pinned by the re-establishment of ecological processes and ecosystem services, for the benefits of both people and wildlife” (Lawton et al, 2010, p ii). By providing insight into whether the NIA Initiative embodies the recommendations of the Lawton Report for Ecological Restoration Zones or ERZs, this chapter aims to provide insights into the success of the NIA Initiative in achieving Lawton’s views for England’s ecological network and contributes to scientific knowledge about the twelve Nature Improvement Areas in England.

This analysis incorporates documents including the Lawton Report (Lawton et al, 2010), NIA data including Guidance Notes (NIA 1), Criteria (NIA 2) and the annual Collingwood reports (CEP, 2013; CEP, 2014a; CEP, 2015a) as well as biophysical, spatial data (please see Table 4.4 and local knowledge and experiences from each
of the 12 NIAs and, where possible, triangulates the document assessment with data from the semi-structured interviews and GIS analyses. The list of documents is presented in Table 3.2.

The research question is addressed through a number of objectives that are structured as follows:

Section 4.1 examines the policy drivers of both the ERZs and the NIAs as presented by key secondary sources from the UK Government, compares them and then examines the multiple objectives with consideration for potential synergies and trade-offs between those objectives, between biodiversity conservation / ecosystem service delivery and between different ecosystem services, specifically focussing on those services which are touched on by the Lawton Report and carried through to the NIA Initiative.

Section 4.2 explores the ERZ recommendations and NIA literature interpretation of stakeholder involvement, then examines the management contexts of the 12 NIAs. Importantly, the analysis highlights local managers’ perspectives on landscape designations, the ecological network and access to funding for wild nature conservation in England.

Section 4.3 presents the biophysical features that each type of area, both ERZs and NIAs, should ideally embody and then investigates those features of relevance to biodiversity conservation, ecosystem service delivery and land use in the NIAs to examine trends using geospatial data for landscape designations in England.

Section 4.4 investigates the recommended actions to achieve both the ERZs and the NIAs, then explores them under the two umbrellas of wild nature conservation and ecosystem service delivery, specifically considering potential synergies / trade-offs.

Section 4.5 draws on document analysis and qualitative information from the semi-structured interviews with the NIA managers to gain better insights into the desired outcomes, examining both national and local motivations for the NIA Initiative and exploring the value of a long-term vision as emphasised in the Lawton Report.

Section 4.6 discusses funding, both the funding recommended by the Lawton Report for the establishment of ERZs and the funding allocated to the 12 NIAs along with the expectation at the national level of the ‘self-sustainability’ with regard to finances of the individual NIAs into the future.

Section 4.7 concludes this chapter with an overview of the key findings.
4.1 Policy drivers: Ecological Restoration Zones and Nature Improvement Areas

This section focuses on the policy drivers of both the Ecological Restoration Zones as put forth by the Lawton Report (Lawton et al, 2010) and the Nature Improvement Area Initiative as presented in the Natural Environment White Paper (2011) using document analysis of the two reports along with the Nature Improvement Areas Competitive Grant Scheme General Guidance Notes (NIA 1) and the Nature Improvement Areas Criteria (NIA 2). Policy drivers are understood as broad aims, targets or statements that are desirable by the various bodies of government or non-government organisations for satisfying their overall goals.

The definitions of both ERZs and NIAs are presented here along with a table (Table 4.1) examining the key objectives of each.

- **Ecological Restoration Zones**: “large, discrete areas within which significant enhancements of ecological networks are achieved, by enhancing existing wildlife sites, improving ecological connections and restoring ecological processes.” (Lawton et al, 2010, p 72). The emphasis in the definition is on improving the core sites for wildlife and facilitating connectivity between them, thereby restoring the ecological processes. These should be areas in which “both the scale of what can be delivered to enhance the network, and the ensuing benefits for wildlife and people, will be very high” (Lawton et al, 2010, p 68), in other words “the gold-standard for places where we should focus efforts to achieve the shift to the restorative phase of nature conservation.” (Lawton et al, 2010, p 68). These areas, although diverse depending upon local circumstances, should embody certain, specific opportunities or features, as outlined in Table 4.1. While such areas should offer benefits for both wildlife and people, the focus is on restoring natural ecosystems and processes, making space for nature.

- **Nature Improvement Areas**: “large, discrete areas that will deliver a step change in nature conservation, where a local partnership has a shared vision for their natural environment. The partnership will plan and deliver significant improvements for wildlife and people through the sustainable use of natural resources, restoring and creating wildlife habitats, connecting local sites and joining up local action.’” (NIA 1, p 5). When examining the definition of Nature Improvement Area, the emphasis is more on the shared vision for the sustainable use of wild nature rather than the improvement of wild nature for more resilient ecological systems. This involves the restoration and creation
of habitats as well as the improvement of connectivity between core sites, but the overarching goal is different to that of the ERZs.

This key difference between the policy drivers for the ERZs and the NIAs is further illustrated when examining their stated objectives, as presented in Table 4.1. The numbers accompanying the NIA objectives, which are out of order, provide the original sequence as stated in the NIA documents but are paired here by content to facilitate comparison.

Table 4.1 Comparison of the stated objectives of the ERZs and NIAs. The accompanying numbers provide the original sequence in the source document.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Ecological Restoration Areas</th>
<th>Nature Improvement Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared vision</td>
<td>1. “a shared vision for an enhanced, resilient natural environment exists among local communities, landowners, local authorities, NGOs and government agencies;”</td>
<td>2. “a shared vision for the natural environment among a wide partnership of local people, including statutory and voluntary sectors;”</td>
</tr>
<tr>
<td>Core sites</td>
<td>2. “significant enhancements of the ecological network over large areas are planned (and subsequently implemented) by enlarging and enhancing existing wildlife sites, improving the ecological connectivity between sites and/or creating new wildlife sites;”</td>
<td>1. “opportunities to establish and improve ecological networks by enlarging, enhancing and connecting existing wildlife sites and creating new sites;”</td>
</tr>
<tr>
<td>Buffer zones</td>
<td>3. “the surrounding land use is better integrated with the management of the network, so that businesses remain profitable while reducing the pressures upon sites and improving the ability of wildlife to move between them;”</td>
<td>3. “surrounding land that can be better integrated with valued landscapes by restoring wildlife habitats and support natural processes adapt to climate change impacts;”</td>
</tr>
<tr>
<td>Biodiversity &amp; ecosystem services</td>
<td>4. “wildlife habitats and underpinning ecosystem processes are restored, so that the ecological network is both better able to cope with pressures and change, and can help to reduce climate change and its impacts;”</td>
<td>5. “‘win-win’ opportunities that offer multiple benefits, such as for: the water environment &amp; Water Framework Directive objectives, flood and coastal erosion risk management, the low-carbon economy;”</td>
</tr>
<tr>
<td>Community engagement</td>
<td>5. “people are inspired by their enhanced experience of the natural world.” (Lawton Report, p 71-72)</td>
<td>6. “opportunities to inspire people through an enhanced experience of the natural environment;”</td>
</tr>
<tr>
<td>Urban spaces</td>
<td>No stated objective.</td>
<td>4. “benefits to urban areas and communities, with, where appropriate, ecological networks extending into urban areas” (NIA Guidance notes, p 5)</td>
</tr>
</tbody>
</table>

Source: Created by author using data from Lawton et al (2010) and NIA Guidance Notes (NIA 1)

The two sets of objectives are very similar; in some cases, the NIA Initiative objectives are taken almost word for word from the Lawton Report recommendations. There are, however, some notable and key differences: 1) the emphasis in the NIA Initiative objectives on win-win opportunities for both wild nature as well as people and 2) the focus in the NIA Initiative on urban areas and people, a key focus for one of the designers at Natural England. As discussed, the Lawton Report (Lawton et al, 2010) is primarily concerned with making space for nature, that is improvements to the ecological network which advance the coherence and resilience of the ecological
network. The emphasis on benefits for people, namely the ecosystem services on which people depend, is specific to the NIA Initiative. Three categories of ecosystem services are provided as examples of potential win-wins in the NIA objectives: water management (framed in terms of benefits for the environment and people including water quality, flooding and coastal erosion), carbon storage and sequestration (framed in terms of benefits for the environment but with more emphasis on benefits for people including the low-carbon economy) and varied cultural services (framed again in terms of benefits for people such as enhanced experience of the natural environment and benefits to communities) which focuses on recreation for the purposes of the concurrence work. While recreation does not encompass all aspects of cultural ecosystem services, it does explore access. Tratolos et al (2015) argue that recreational activities, of which access is a key aspect, form an important part of the way in which the benefits of cultural services are realised and that other cultural benefits, which might be considered distinct from recreation, are frequently stimulated through direct experience of natural spaces; thus it is key to evaluate access to such spaces if other benefits are to be fully understood. Fish et al's (2016b) framework for cultural ecosystem services also emphasises "that services and benefits do not simply arise from ecosystems but are co-constructed through the interaction between people and their environments," (Fish et al, 2016a, p 330).

Two types of potentially conflicting land uses are also prioritised in the NIA objectives: urban areas and agricultural land. While agricultural land use is not explicitly stated, it is implied by the statement “surrounding land that can be better integrated with valued landscapes” (NIA 1, p 5) as, when this is explored further in the NIA Criteria document, it specifies "surrounding land that is managed, including for sustainable food production, in a wildlife friendly way" (NIA 2, p 2). What is not addressed by the NIA Criteria (NIA 1) and Guidance Notes (NIA 2) is the potential trade-offs that might occur, both between biodiversity conservation and the delivery of certain ecosystem services but also between different ecosystem services. As Mace (2014) states, “It is widely assumed that conserving the greatest numbers of wild species and intact habitats will be consistent with maximizing the ecosystem services that these areas provide to people. Yet, although most ecosystem functions are enhanced with more ecological and species diversity [Cardinale et al, 2012], adequate supplies of food or clean water for growing human populations have come from converting intact wilderness into land for agriculture, and canalizing or even draining many rivers and wetlands, thus reducing diversity." (p 1559)
Land area is a limiting resource and, as such, presents an obvious trade-off, as land designated for creating new sites or expanding existing sites for nature conservation is thus not available for other purposes. To address these potential trade-offs, the Lawton Report (Lawton et al, 2010) merely states that as more existing sites are improved, there will be less of a need for new sites. The Lawton Report (Lawton et al, 2010) provides a hierarchy to assist with such decisions, which is summed up by “more, bigger, better and joined” (Lawton et al, 2010, p 61). The hierarchy provided suggests that “better management of existing sites” is preferred over “bigger sites” which is preferred to “more sites” which is better than purely focusing efforts to “enhance connectivity” which is turn is better than just focusing efforts to “create new corridors” (Lawton et al, 2010, p 58). Of course, the application of this hierarchy can vary depending upon local circumstances.

Although the Lawton Report (Lawton et al, 2010) does not discuss trade-offs further, it does discuss current and future trends in land-use, specifically presenting ‘Foresight in Land Uses: Making the most of land in the 21st century’ (Foresight Land Use Futures, 2010) as a thorough assessment of pressures on land use in the UK. Land use in the past has been largely dictated by policy which has emphasised agriculture (Lawton et al, 2010). The Foresight in Land Uses document identifies six main drivers of land use change over the next four decades. These are: demographic change; economic growth and changing economic conditions; climate change; new technologies; societal preferences and attitudes; and the policy and regulatory environment. In other words, urban and suburban as well as agricultural land use are both likely to increase as pressures on land use in the UK. To explore these potential trade-offs between ecosystem services, first urban and suburban spaces are considered, then recreation, agricultural land use, water and, finally, carbon.

**Urban and suburban spaces**

As previously mentioned, the second difference between the ERZ and the NIA policy drivers is that the NIA objectives explicitly mention the inclusion of urban areas and communities, which is not touched on at all in the Lawton Report ERZ objectives. Urban and suburban areas impact green spaces within them in diverse ways and improving urban or suburban green spaces for the benefit of wild nature is not simple. Nielsen et al (2014) conducted a review of empirical studies on species richness in urban parks in the UK and determined that while parks are among the most species-
rich of urban green spaces, exotics constitute a sizeable share of those species, particularly plant species. Furthermore, improving urban biodiversity requires management at different scales. Goddard et al (2009) suggested that another key urban green space, the individual garden, is a much smaller unit of management than that which is necessary to maintain viable populations of certain species and thus management to improve biodiversity in urban gardens requires action across scales, which can be difficult.

Improving key means of connectivity between core sites to improve urban biodiversity can be challenging in urban and suburban spaces due to the heavy development of such spaces (Rudd et al, 2002), particularly groups such as plants or invertebrate species which may not use urban greenways for dispersal (Angold et al, 2006). Additionally, the effects of continued urbanisation have different impacts depending on the level of development and the types of species; extreme urbanisation tends to result in a decrease in species richness for most specie groups but moderate urbanisation, perhaps more along the lines of that found in suburban areas, can result in increasing species richness for some groups and decreasing species richness for others (McKinney, 2008). The Lawton Report also emphasises that “A richer, less hostile environment around the network will also, in itself, provide space for nature and support the provision of ecosystem services at landscape scales.” (Lawton et al, 2010, p 88). In other words, a buffer zone around urban green spaces can potentially improve biodiversity, but this is likely to be more difficult in built up area.

Urban and suburban spaces also impact other ecosystem services and their delivery. Green spaces near urban centres can play an important role in recreation, but NIAs which are overwhelmingly urban may run into trade-offs with regard to the delivery of other ecosystem services as well as biodiversity than NIAs with more moderate areas of urban or suburban land uses. Tratalos et al (2007), who examined the relationships between urban form and certain measures of ecosystem service performance, including storm-water run-off and carbon sequestration in UK cities, determined that almost all measures of ecosystem performance declined with increasing urban density. Agricultural production as a land use is also in direct conflict with urban and suburban spaces, although smaller-scale urban agriculture can provide important benefits for both biodiversity and some ecosystem services (Lin et al, 2015).
Recreation

Upon initial examination, improving or increasing green space for recreation also provides more and potentially better space for nature. Thus, recreation might be thought to be a win-win opportunity and a key ecosystem service in the attempt to achieve a “step-change” in nature conservation as sought by the Lawton Report. Recreation in green spaces, in both urban and rural environments, directly engages people with nature and provides a whole host of benefits for both physical and mental well-being (Wolch et al, 2014). In fact, engaging people is a key objective of both the Lawton Report and the NIA Initiative: both seek to “inspire people” through an “enhanced experience” of natural spaces. However, while improving access and securing and / or improving green spaces for recreational purposes can provide space for nature, some recreational activities can also have detrimental impacts on wild nature in those spaces (Pickering, 2010). This is also true of certain ecosystem services, for example the natural history and perceived cultural value of a landscape (Ament et al, 2017), particularly depending upon the type of recreational activity and the level of use.

Furthermore, improving the quantity or quality of an area for recreation or cultural values does not necessarily improve the quantity / quality of the space for nature nor are local perceptions of biological value always accurate (Brown et al, 2004). As one NIA said, “Everyone looks at a green field and says, ‘That is absolutely beautiful,’ when it’s just a field of rye grass, so biodiversity-wise it’s not particularly interesting at all. Like, 40 years ago, they were species-rich grasslands, and that change has happened, and now everyone thinks...People just don’t even understand that that’s happened.” (NIA i). Thus, it cannot be assumed green space conserved for recreation or landscape value will also provide a beneficial opportunity for wild nature conservation. Fish et al (2016) also noted a ‘discrepancy’ in the public perception of wild nature in Northern Devon NIA through an examination of cultural ecosystem services in the area, stating “At one level, general awareness of the area as being formally designated for its natural heritage and importance was low; just over a quarter of questionnaire respondents were aware they lived in a ‘Nature Improvement Area’ and less than a fifth were aware of the area's UNESCO Biosphere Reserve status” (p 335).

Recreation can also interact negatively with other ecosystem services. Farmers do not always like people crossing their land for recreational purposes which can inhibit access to certain sites. Defra’s Health and Harmony consultation noted that “Public
access was a popular topic of discussion. Many supported the benefits of access, such as improved public health and engagement, however farmers frequently raised concerns about potential damage to their businesses and property,” (2018a p 6). One NIA also raised this point: “farmers hate rights of way” (NIA xi). Finally, improving access in the form of cleared spaces or roads to natural spaces can increase water run-off, thereby increasing erosion (Pickering, 2010) and decreasing water quality. In other words, win-win opportunities cannot be assumed.

Agriculture

Agricultural production results in not one but two potential broad trades-offs: one between land used for agricultural production and land for conservation but also a second trade-off potentially between the productivity of land already used for agricultural production and sustainable management of that space in order to enhance its contribution to the ecological network. The Lawton Report (Lawton et al, 2010) states that “government policy drove the intensification of land-use for much of the twentieth century, while the EU Common Agricultural Policy has had a strong influence on how agricultural land is used and managed in recent decades” (p 21). As Erb et al (2013) state, agricultural intensification or “many of the current techniques of yield enhancement are associated with far-reaching, detrimental ecological and social effects [Foley et al, 2005; IAASTD, 2009; Tilman, 2001]” (p 464).

Agri-environment schemes or AES, which are supported through the Common Agricultural Policy, are the primary approach for sustainable environmental management in the countryside; there are two types of schemes currently used, namely Higher Level Stewardship or HLS and Entry Level Stewardship or ELS. HLS is a targeted scheme that focuses on areas identified as important for achieving the scheme’s biodiversity or other conservation objectives. Its priority are the most significant or key areas of priority habitat and populations of priority species. Its major constraints are the limited funding available to the scheme, the complexity of set-up, and the necessity of continuous, targeted advice to achieve high calibre agreements (Lawton et al, 2010). As a result of resource limitations, HLS is confined to certain land managers whose land encompasses a priority area, thus restricting its effectiveness.

ELS, in contrast, is available to all land managers. However, it is also less effective with regard to benefits for wild nature conservation (Davey et al, 2010 in Lawton et
al, 2010), although there have been some positive results (Field et al, 2010; Pywell et al, 2010 in Lawton et al, 2010). It exemplifies a pick-and-mix approach which has resulted in a skewed uptake favouring certain habitats for management, combinations of options which are not chosen to achieve key outcomes and certain options which are not as effective as they might be were there improved guidance available and improved coordination between nearby landowners (Lawton et al, 2010).

Furthermore, AES are considered to be able to provide only moderate gains for biodiversity (Kleijn et al, 2006; Birrer et al, 2007; Davey et al, 2010). A review of recent research suggests that most demonstrate general increases in farmland biodiversity in response to such schemes, but the size of the effect depends upon the structure and management of the surrounding landscape (Betáry et al, 2015). Some species benefit more than others; plants tend to demonstrate the strongest positive responses to AESs, then invertebrates, while birds and mammals produce the smallest responses (Whittingham, 2011; Kleijn et al, 2006; Gabriel et al, 2010). Finally, the effects on different areas of farmland are not consistent; schemes aimed at areas not involved in production (like field margins and hedgerows) are more effective at enhancing species richness than those aimed at productive areas (like arable crops or grasslands) (Betáry et al, 2015).

HLS and ELS underline the two, overarching trade-offs between wild nature conservation and agriculture; HLS demonstrates the trade-off in land use where land used for agricultural purposes is shifted to land used for wild nature conservation and ELS a trade-off in production whereby land is managed more sustainably, potentially reducing productivity. Furthermore, agricultural production, in addition to presenting a trade-off with wild nature conservation, can also present trade-offs for other ecosystem services. In fact, “a key finding of the UK NEA was that land-use change in the UK over the past 40 years had increased the output of provisioning services, mainly agricultural production, at the expense of a range of regulating and cultural services” (Norris and Butler, 2013, p 1). Agricultural production can result in increased water pollution (Mateo-Sagasta et al, 2017; Gobel et al, 2007), increased surface runoff resulting in a higher frequency and greater extent of downstream flooding (McIntyre and Thorne, 2013) and reduced carbon storage depending upon landscape features (Johnson et al, 2014). Yet research suggests that, when exploring the impacts of agricultural intensity on ecological processes, biodiversity as well as ecosystem services including carbon storage, water quality and water retention are vital for a comprehensive, analytical framework for considering land use (Erb et al, 2013).
Water

Effective water management can provide win-win opportunities in some respects for water quality and wild nature. What is briefly touched on in the Lawton Report (Lawton et al., 2010) in the water management segment and explored more in Section 4.2 of this work in the context of the NIA Initiative is the engagement of landowners/managers like water companies who utilise positive land management to address water quality problems. Water companies often find that funding appropriate land management is the most cost-effective means for addressing water quality issues and also has the benefit of improving the environment for wild nature (Lawton et al., 2010). United Utilities addressed water quality by focusing on wider catchment management in the north of England in conjunction with the RSPB and with the dual focus of improving water quality and wild habitats (Keirle and Hayes, 2007). South West Water addressed water quality issues by working with land managers upstream and others in partnership to address water quality issues downstream, thus avoiding costly treatment in the south west of England (Grand-Clement et al., 2013; Smith, 2013). Certain natural habitats also contribute effectively to water flow and regulation by reducing run-off and increasing storage (Farley et al., 2005; Thomas and Nisbet, 2006). While water management may provide win-win opportunities for wild nature and water quality, water storage or carbon sequestration (addressed in the following section), it is also in conflict in some regard with agricultural production and the inclusion of urban/suburban areas in the ERZs or NIAs as shown in the preceding sections.

Carbon

Carbon storage as an ecosystem service is often cited as a win-win scenario in conjunction with nature conservation as many natural habitats and ecosystems are carbon sinks including a number of priority habitats in the UK. The Lawton Report (Lawton et al., 2010) emphasises one habitat in particular: peatlands, specifically lowland peat, which is not as well protected in the UK as other habitats nor fully recognised for the large contribution such ecosystems could make to mitigating climate change. Peatlands are associated with the provision of a variety of ecosystem services including carbon storage, improved water quality and flood protection (UK NEA, 2011). Furthermore, management practices are known to affect some of these
critical ecosystem services provided by peatlands, particularly carbon storage (Hubacek et al, 2009). Agriculture, in particular, has resulted in the degradation of peatland habitat as a result of drainage, peat cutting, burning, grazing or afforestation (Bonnett et al, 2009). Historically, drainage was undertaken to facilitate increased food production as well as mitigate flooding, although there is little evidence that drainage did in fact alleviate flooding (Ratcliffe and Ostwald, 1988; Holden, Chapman and Labadz, 2004; Stewart and Lance, 1983; Wilson, Wilson and Johnstone, 2011). Farming has also intensified in recent decades, further increasing pressures on the habitat-type, particularly as peatlands cannot sustain high grazing densities (Holden et al, 2007; Holden, Chapman and Labadz, 2004).

4.2 Management contexts and partnership perspectives on England’s ecological network

The focus of this section is on participation of organisations in the NIA Initiative and how this is framed by the ERZ recommendations in the Lawton Report (Lawton et al, 2010) and interpreted by the NIA Initiative in the Guidance Notes (NIA 2). It explores the role of institutions in policy discourse, which highlights three key issues according to Rydin; the problem of participation; the problem of achieving consensus; and the role of professional policy makers (1999, p 476). Section 4.2.1 examines and compares the ERZ and NIA Criteria and Guidance Notes (NIA 1; NIA 2) on participation, particularly exploring the approach to landowners / managers and emphasis on connections with existing landscape designations. The second section, Section 4.2.2, then examines the management contexts of the 12 NIAs and the resulting impact on the partnerships which ultimately took part in the Initiative.

4.2.1 Participation: ERZs and NIAs

The Lawton Report (Lawton et al, 2010) specifically identifies the ERZs as a shared vision between varied actors with a unified approach to their local landscape all hoping to achieve a ‘step-change’ in the current approach to nature conservation. These areas were to be managed by a “consortia of local authorities, local communities and landowners, the private sector and voluntary conservation organisations, supported by national agencies” (Lawton et al, 2010, p 72). These local actors were to come together to achieve the vision of the Lawton Report (Lawton et
al, 2010), with the intention that local people value their local environments and prioritise wild nature. Lawton et al (2010) suggest that their vision will only be achieved if “we work at local scales, in partnership with local people” (p ii) to deliver a more coherent and resilient wildlife network.

When examining the NIA data, the Guidance Notes (NIA 2) state that “partnerships established in England [are] invited to apply” (p 7), thus establishing an emphasis on pre-existing partnerships in some form. These partnerships were to include two or more actors including local governments / planning authorities (including National Parks and Areas of Outstanding Natural Beauty), significant private landowners, environmental Non-Government Organisations with land holdings, or community and social enterprises, town and parish councils or the private sector with the involvement of a government body such as the Environment Agency, Forestry Commission or Natural England. Furthermore, the Guidance Notes (NIA 2) state that formal partnerships should be in place prior to the second stage of the application which is the Business Plan that outlines specific objectives and targets for each NIA.

While the lists of potential actors detailed in the Lawton Report for the ERZ program and those specified in the NIA Initiative Guidance are very similar, as shown in Table 4.2, they illustrate some fundamental differences in approach.
Lawton et al (2010) envisioned partnerships in terms of a shared vision amongst local people in order to emphasise the importance of making space for nature in their local areas. The NIA Initiative, in contrast, emphasises partnerships in a delivery context, seeking areas with established relationships and working practices which enabled multiple stakeholders to work collaboratively, particularly from the voluntary sector / NGOs according to conversations with people in Natural England. Essentially, the NIA approach facilitates a more top-down approach, overlooking certain stakeholders such as the small, private landowners or managers or landowner / manager groups specifically.

Understanding the role of the landowner or manager as participants in this approach is key, particularly as Lawton states that a top-down approach is not sufficient (Lawton et al, 2010, p 56). The Lawton Report (Lawton et al, 2010) emphasises that its recommended approach will only work if it does not constitute an unreasonable burden on landowners and managers. Furthermore, the report suggests that protected spaces for wildlife need not necessarily be designated spaces, as the most
direct way of securing the ecological network is by engaging in a sympathetic manner with the owners and managers of the areas in question. This is true of both private owners and land managers but also conservation NGOs which own and manage a significant amount of land in England. In other words, designations are important but so are non-designated spaces managed in a considerate way for wildlife, for which engaging with landowners / managers is key; “private landowners, land managers and farmers have a crucial role to play in delivering a more coherent and resilient wildlife network,” (Lawton et al, 2010, p ii).

The top-down slant of the NIA Initiative is furthered by the emphasis on connections with existing landscape management authorities such as National Parks or Areas of Outstanding Natural Beauty, which is not present in the ERZ recommendations. Landscape designations are acknowledged in the Lawton Report (Lawton et al, 2010) as important parts of England’s ecological network but are not directly linked to the ERZs. As the Lawton Report (Lawton et al, 2010) states: “Space is precious and the better we manage our remaining wildlife sites and the habitats within them, the less area we will need to create new habitats to establish a coherent and resilient ecological network.” (p 57). AONB and NP landscape designations contribute significantly to the ecological network; they contain more than 50% of SSSIs by area in England. Furthermore, there is definite room to improve the contribution of AONBs and NPs to the ecological network as, though they contain more than half of designated small protected areas, they are not necessarily better at providing conservation benefits for the small protected areas within them when compared to small protected areas outside any landscape designations (Lawton et al, 2010). Thus, the Report concludes that they have quite a bit of potential but should be made to work harder at providing both conservation benefits as well as ecosystem service benefits, as discussed in Recommendation 14 of the Lawton Report (Lawton et al, 2010):

“Recommendation 14: In view of the opportunity presented by their existing statutory remits, in National Parks and AONBs:
(a) favourable condition of SSSIs should be achieved as quickly as possible;
(b) non-SSSI semi-natural habitat should be brought under management equivalent to SSSI standards; and
(c) other land should be managed so as to enhance connectivity.” (p 80).

The contribution of landscape designations like the National Parks and AONBs to England’s ecological network is of increasing importance; in fact, the government recently ran a Landscapes Review from the 20th of October, 2018 to the 18th of
November, 2018 in order to improve understanding of what “works well and what could be improved in England’s National Parks and Areas of Outstanding Natural Beauty” (Landscapes Review, 2018, https://www.gov.uk/government/consultations/landscapes-review-national-parks-and-aonbs-call-for-evidence). Ultimately, however, what emerges from this analysis is the understanding that the Lawton Report’s (2010) idea of a shared vision of a local partnership and that of the NIAs were fundamentally different; the ERZ approach emphasises more of a bottom-up approach whereas the NIA Initiative emphasised a more top-down approach. Furthermore, the top-down emphasis on connections with existing partnerships and landscape designations by the NIA Initiative has implications for the implementation, delivery and outcome of NIA initiative goals and is thus discussed in detail in the following section, Section 4.2.2.

4.2.2 Management contexts and the 12 NIAs

The formality of the existing partnerships (namely whether formal, informal or otherwise) was reported in the First Annual NIA Report (CEP, 2013). However, as previously mentioned, this report and all subsequent reports failed to explore the existing governance, management strategies or the relationships and their formality in any more depth; specifically, the reports neglected to examine the nature of the relationships that existed prior to the Initiative and, particularly, the impact of those relationships on the partnerships that were set up for the NIA program. Indeed, the Report identified the importance of exploring the context of the existing governance and management strategies but never built on that intention. “Exploring these historic partnership and governance aspects in more detail is considered important as context in understanding the relative success and achievements of the NIA partnerships.” (CEP, 2013, p 27). This work agrees with that statement and further holds that exploring the existing management structures is of key importance when examining the political processes of the implementation, success and outcomes of the NIA Initiative as a whole as well as the achievements of the individual partnerships.

As stated in the First Annual Report (CEP, 2013), six partnerships had been formally established prior to the NIA Initiative; those NIAs were Dark Peak, Dearne Valley, Humberhead Levels, Meres and Mosses, Northern Devon and Wild Purbeck. Four were considered to have had formal/informal partnerships; those include Birmingham and the Black Country, Greater Thames Marshes, Morecambe Bay and Nene Valley.
Two, Marlborough Downs and South Downs, created new partnerships for the NIA Initiative. However, the South Downs NIA was led by the South Downs National Park Authority which had quite a bit of experience with landscape management and partnership working and thus might be considered to have had relationships with potential partners despite the fact that no partnerships existed. As the South Downs Park Authority stated: “We’re very keen on partnership working. And we don’t lead on everything, but we felt this was something that was applicable across the whole of the national park and we should lead on.”

This work argues, however, that the formality, or lack thereof, of the existing partnerships is not enough to provide a solid understanding of the impact of management contexts on the NIA partnerships. A more in-depth examination is needed which takes into account not only the formality of the partnership but the type of lead-body and the resources of the partnership as well. This analysis is presented here. There are twelve NIAs which this research argues can be broken down into three categories of four NIAs each. The described characteristics and groupings of the 12 NIAs according to this management context breakdown can be seen in Figure 4.1.

Figure 4.1 Characteristics of management groups and classification of individual NIAs. Landscape designation is noted as LD.

<table>
<thead>
<tr>
<th>Management Group 1</th>
<th>Management Group 2</th>
<th>Management Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Existing, largely formal partnership or strong lead with partnership experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Large overlap with LD which is incorporated into management approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Landscape management body as stakeholder</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Existing, largely formal partnership</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- No significant overlap with LD or no acknowledgement of LD with which NIA overlaps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- No landscape management body as stakeholder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formal and informal or new partnership</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No significant overlap with LD or no acknowledgement of LD with which NIA overlaps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No landscape management body as stakeholder</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NIAs</th>
<th>NIAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Peak</td>
<td>Birmingham &amp; the Black Country</td>
</tr>
<tr>
<td>Morecambe Bay</td>
<td>Greater Thames Marshes</td>
</tr>
<tr>
<td>South Downs</td>
<td>Marlborough Downs Marshes</td>
</tr>
<tr>
<td>Wild Purbeck</td>
<td>Nene Valley</td>
</tr>
<tr>
<td>Dearne Valley</td>
<td>Humberhead Levels</td>
</tr>
<tr>
<td>Humberhead Levels</td>
<td>Meres and Mosses</td>
</tr>
<tr>
<td>Meres and Mosses</td>
<td>Northern Devon</td>
</tr>
</tbody>
</table>

Source: Created by author based on data from semi-structured interviews, the NIA Year 1 Monitoring and Evaluation Report (CEP, 2013) and biophysical features determined using ArcGIS and data from the magic.gov.uk data based described in Table 4.4.
There are three considerations regarding groups in this framework. Morecambe Bay is identified as a formal / informal partnership in the Year 1 Monitoring and Evaluation Report (CEP, 2013) but the lead partner is an AONB and thus is it is considered to have the characteristics of Management Group 1: an NIA with existing relationships or a formal partnership which includes a body overseeing a landscape designation. South Downs is identified as new a partnership, but it is led by the South Downs Park Authority and thus is also considered to have the characteristics of Management Group 1. Finally, the area of the Northern Devon NIA includes a Biosphere Reserve international landscape designation but this designation is an international designation which is perhaps not as widely recognised in the UK (see Fish et al, 2016) and thus it is considered to most closely embody the characteristics of Management Group 1, an NIA with an existing, formal partnership but which does not include a body which oversees a landscape designation.

Existing partnerships largely dictated stakeholder involvement. A breakdown of the types of stakeholders involved with the individual NIAs can be seen in Figure 4.2

Figure 4.2 A breakdown of the types of stakeholders involved with each, individual NIA.

Source: Derived from Year 1 Monitoring and Evaluation Report (CEP, 2013).

In three cases, according to the semi-structured interviews, the existing partnerships or relationships pretty much transitioned almost directly into the NIA partnerships. Furthermore, these three NIAs all belong to either Management Group 1 or 2. In another five NIAs, a few additional partners were brought in. However, most of the NIAs in this group indicated that additional partners had been somewhat tangential,
helping with certain projects or in certain ways but not necessarily involved with the overall direction or implementation of the NIAs or involved from the very beginning. Thus, existing management structures again largely informed the resulting NIA partnerships. Lastly, four NIAs did involve new partners in a significant way, but these partners were mostly sourced through personal contacts. In some cases, this involved groups which had not traditionally worked together, but this was limited. Indeed, while in some NIAs, interest in the NIA Initiative was quite enthusiastic and many organisations were keen to join, this resulted in additional management challenges, such as the need to limit involvement discussed next.

The lead body or group directing the NIA Initiative application also generally coordinated the involvement of other groups, overseeing what groups were involved and how. As one NIA stated, “It’s a bit of a pragmatic mix of what you’d like to do, who your best partners are in terms of how efficient and organised they are and getting the proposals up and costed according to the timescale.” (NIA iv). In some cases, this meant limiting involvement in some capacity. The decision of which stakeholders to involve and which to limit had longer-term effects for certain NIAs: “…right at the start of the project – 30 organisations turned up. He cut that down to 10…Hindsight says it would have been nice to involve slightly different people…” (NIA vii). In others, participation was not limited, which proved difficult to manage by the end of the initiative. Additionally, some NIAs found that groups that had not traditionally worked together found it difficult to combine forces. NIAs in the last management category, those areas without existing relationships or formal partnerships, seem to have struggled more than the others. Ultimately, however, the lead bodies organised who was involved and how, which, again, was often heavily influenced by existing relationships.

In addition to impacting general participation, the management context categories also revealed another trend in the data: areas with landscape designations also appear to take a long-term approach to engaging with landowners, often establishing and maintaining relationships with local landowner / manager groups and emphasising continuous, consistent interaction. One NIA stated that “We know from talking to the farmers that what they want is continuity. That’s why we decided, even though it may have cost possibly a bit more, we would buy in the time from FWAG, who again were there before and are there afterwards and provide that continuity. I think that’s actually a much better strategy.” (NIA iv). This participation is not limited to small landowners or managers however; in some cases, the landowners or managers are utilities or other types of organisations such as the National Trust. Such
interactions are not emphasised in areas without landscape designations and these relationships likely play an important role in engaging landowner / manager groups which might not otherwise be included in the conservation dialogue.

Lead bodies and steering groups directed the strategic vision of the NIAs. As one NIA put it, "I guess for all of these NIAs, whoever is the lead partner cajoles the support out of everyone else and then sees what they want out of it." (NIA i) This strategic vision embodies the priorities of the groups in question including how they approach biodiversity conservation, ecosystem service delivery and win-win opportunities for both. This section first explores the types of lead bodies and organisations participating in the NIAs, then examines how strategic vision was developed by the NIA stakeholders in the partnerships and, finally, ends with an exploration of the varied approaches to landowner / manager engagement, all while referring back to the categorisation of management context detailed previously.

There are seven different types of lead bodies in the NIAs: wildlife trusts, the RSPB, AONBs, NPAs, a Regional Park, the Thames Estuary Partnership Ltd and the Marlborough Downs NIA Ltd. Most often, the lead body was also the accountable body. In three cases, lead bodies and accountable bodies were different; for all three, the financially accountable body was a county / district council. Lead bodies, however, drove strategic vision and participation and were responsible for delivering on objectives in all cases. Thus, this work is primarily concerned with lead bodies. Table 4.3 shows the various types of lead bodies along with the number of NIAs led by that type of body, their scale of influence, their designation focus and addresses their biodiversity conservation / ecosystem services priorities or emphases. The data were sourced by examining the information provided by the establishing bodies regarding the features and objectives of each category, the sources of which are found below the table.
Table 4.3 Table of lead bodies and their characteristics.

<table>
<thead>
<tr>
<th>Lead Body Type</th>
<th>No. of NIAs led by type</th>
<th>Scale</th>
<th>Designation Focus</th>
<th>Biodiversity Aims</th>
<th>Ecosystem Service Aims</th>
<th>Emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildlife Trust</td>
<td>4</td>
<td>Operating nationally, Individual focus locally</td>
<td>Across scales: protected areas to living landscapes</td>
<td>Yes</td>
<td>Yes</td>
<td>Dual but emphasis on Biodiversity</td>
</tr>
<tr>
<td>RSPB</td>
<td>2</td>
<td>Operating nationally</td>
<td>Protected areas</td>
<td>Yes</td>
<td>No</td>
<td>Biodiversity</td>
</tr>
<tr>
<td>AONBs</td>
<td>2</td>
<td>National</td>
<td>Landscape Areas</td>
<td>No</td>
<td>Yes</td>
<td>Dual but emphasis on Cultural Ecosystem Services</td>
</tr>
<tr>
<td>NPA</td>
<td>1</td>
<td>National</td>
<td>Landscape Areas</td>
<td>Limited</td>
<td>Yes</td>
<td>Dual but emphasis on Cultural Ecosystem Services</td>
</tr>
<tr>
<td>Regional Park</td>
<td>1</td>
<td>Local</td>
<td>Protected Areas</td>
<td>Limited</td>
<td>Yes</td>
<td>Dual</td>
</tr>
<tr>
<td>Thames Estuary Partnership Ltd</td>
<td>1</td>
<td>Estuary-based</td>
<td>Specific landscape</td>
<td>Yes</td>
<td>Yes</td>
<td>Dual</td>
</tr>
<tr>
<td>Marlborough Downs NIA Ltd</td>
<td>1</td>
<td>Specific landscape area</td>
<td>Specific landscape</td>
<td>Yes</td>
<td>Limited</td>
<td>Biodiversity</td>
</tr>
</tbody>
</table>

Source: Created by author with data from the following sources:

7) NIA Year 1 Monitoring and Evaluation Report (CEP, 2013) and Marlborough Downs Business Plan (MD BP)

The impact of the management context was of key importance when it came to developing a bid for the NIA Initiative. Landscape designations such as AONBs and NPs in England generally have a management body such as a partnership or authority which develops a management plan including strategic vision for the area (Natural England website, 2017; National Parks UK website, 2018). Thus, NIAs whose lead bodies or key stakeholders were landscape management authorities had a strong basis from which to work. Areas without landscape management bodies as partners but which had formal, existing partnerships also developed their strategic vision from previous work done by the partnerships. “Because the…Partnership had been around for so long, it had done a lot of that background work. It knew where and why priorities were priorities, and what the strategic outcomes were. Lots of that had been cleared up. In terms of the bigger picture, the groundwork was there for why all the key partners were bought in.” (NIA vi). Those areas with informal, or without any
existing partnership at all, struggled more. “There’s been a lot of work on nature conservation, but even today it’s not quite coordinated. People are doing their own thing.” (NIA x). With the first two Management Groups, the NIAs had a much better basis from which to launch a bid when compared to areas without existing relationships or formal partnerships in place.

Formal partnership agreements were to be in place prior to the 2nd stage of the competition according to NIA Guidance Notes (NIA 1). Furthermore, prior to the dispensation of funds, partnerships were expected to have the capacity and finances in place to cover any project costs prior to the start of the program (NIA 1), which posed a significant barrier for some NIA applications. 10 of the NIAs discussed the improved capacity of areas with landscape designations and established partnerships to access funding like the NIA Initiative over areas with more informal or fragmented approaches and no landscape designation. As one NIA summed it up: “It’s quite interesting in terms of major designations that actually if you already exist in some form of partnership with a bit of a structure, you’re in a far better position to get the money than you are if you come along and say- I look at that and say- I mean what really annoyed me was this is desperate to have a coherent plan and yet money goes to AONBs, which have been getting money for plans for decades.” (NIA x). However, as one NIA with a landscape designation points out, there is always need for more funding to continue conservation work: “there almost was a risk we didn’t get the grant because we had too much going on anyway and we didn’t need it, kind of thing. I think there was a bit of feeling of, ’Lots has been happening in [specific area], so you don’t need that grant.’ We were going, ‘No, we do need it. We have done a lot, but we want to do a lot more. There’s a lot more to do.’” (NIA iv). The ERZs were intended to be designed so that all types of areas could access the funding opportunity provided they demonstrated the potential for significant benefits for the ecological network. Thus, the emphasis on existing partnerships by the NIA Initiative does potentially exclude some groups from applying or engaging effectively in the competition process but also impacts how the NIAs interact with the existing ecological network of landscape designations in England.

Finally, the management context impacts how priorities were developed for a bid; areas with strong partnerships built upon existing strategies. They were not necessarily seeking to employ new or innovative strategies but often just continuing on with their established objectives. In fact, of the eight existing partnerships, six indicated that they were predominantly carrying forward with existing priorities, work that likely would have been undertaken regardless of the NIA Initiative. As one NIA
put it, “we saw it as a mechanism to lever funding to actually deliver what our aspirations were as a partnership already. We already had those aspirations and then this was a major opportunity that arose that we wanted to try and bid for,” (NIA ii). If the NIA bid had not been successful, in many cases the partnerships stated that they would have carried on with the work in other ways. There is clearly some interest in expanding beyond the status-quo, but existing partnerships seem pre-disposed towards existing strategies that perhaps do not provide as much innovation as new partnerships might. In conversations with contacts overseeing public bodies, it was noted that there was pushback from perceived traditional conservation bodies working to continue existing, often site or specie-specific approaches.

Ultimately, this examination of the three categories of management context highlights the over-arching challenge: the difficulty in focusing limited resources (including both biophysical and financial) to achieve the most benefits for conservation and the ecological network in England. Understanding the management contexts of the NIAs is essential in addressing this challenge. Established partnerships were better prepared for the bid process outlined by the NIA Initiative; however, such areas also had established stakeholder groups and management plans in many cases, limiting both wider community engagement and potentially innovation. The Lawton Report (Lawton et al, 2010) acknowledges the importance of adding new spaces for wild nature, stating “Protecting and managing components of England’s ecological network is essential, but will not be sufficient to make the network resilient and coherent” (Lawton et al, 2010, p 83). The importance of management context, with consideration for the three Management Groups described here, is discussed and used to understand results throughout the four analysis chapters, including the next section, 4.3, which explores the biophysical features of both the selected wider landscape areas and the focal areas within those landscapes. This section particularly deals with the design of the NIA Initiative, that is the how, not the what; the impact of existing management strategies on the implementation and outcomes of the NIA Initiative are addressed in Chapters 5 and 6.

4.3 Biophysical requirements of the ERZs and NIAs and features of the 12 individual NIAs

This section presents a comparison of the desired biophysical features for both ERZs (Lawton et al, 2010) and NIAs as stated in the NIA Guidance Notes (NIA 1) and
Criteria (NIA 2) as well as explorations and analyses of the actual biophysical features of the 12 NIAs conducted using UK Government spatial data (please see Table 4.4) and associated qualitative data sourced from the semi-structured interviews with managers. This section is organised in the same format as other sections: ERZ and NIA recommendations are discussed and compared first then the biophysical features and associated qualitative data of the individual NIAs examined.

Table 4.4 A table of GIS data sets utilised in these analyses, including source and date of access.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Data Set / Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land use</td>
<td>25 - metre raster</td>
<td>Centre for Hydrology and Ecology (CEH) LCM2015 25-metre, April 09, 2017</td>
</tr>
<tr>
<td></td>
<td>1 - kilometre raster</td>
<td>CEH LCM2015 1-kilometre, April 09, 2017</td>
</tr>
<tr>
<td></td>
<td>Environmental Stewardship Agreements</td>
<td>Environmental Stewardship Scheme Agreements (England), shapefile, data.gov.uk, September 28, 2019</td>
</tr>
<tr>
<td>Designated area</td>
<td>NIAs</td>
<td>Nature Improvement Areas shapefile, data.gov.uk, March 1, 2013</td>
</tr>
<tr>
<td></td>
<td>AONBs</td>
<td>Areas of Outstanding Natural Beauty - England shapefile, data.gov.uk, March 1, 2013</td>
</tr>
<tr>
<td></td>
<td>NPs</td>
<td>National Parks - England shapefile, data.gov.uk, March 1, 2013</td>
</tr>
<tr>
<td></td>
<td>Core Areas</td>
<td>Shapefiles for: Biosphere Reserves; Ramsar sites; SSSIs; Heritage Coasts, data.gov.uk, March 1, 2013</td>
</tr>
<tr>
<td>Species data</td>
<td>Species observations</td>
<td>NBN Priority Species Observations, May 11, 2016</td>
</tr>
</tbody>
</table>

Source: Created by author (CEH; NBN; all other data)

There are no physical features or descriptions of ERZs provided by the Lawton Report (Lawton et al, 2010) beyond that they are “large, discrete areas” (p 72) that should contribute to England’s ecological network(s). There are, however, a number of land
area criteria described by the NIA Guidance Notes (NIA 1) and NIA Criteria (NIA 2); “A candidate nature improvement area will:

- comprise a large area, probably greater than 10,000 ha, unless the proposal fits to some smaller obvious ecological boundary. To reduce the risk of effort being spread too thinly, partnerships should avoid proposing very large areas (e.g. in excess of 50,000 ha) unless they can convincingly demonstrate that significant enhancements are likely to be achieved throughout the NIA;
- include a variety of land uses, and may include urban areas;
- provide opportunities to enhance the functioning of ecological processes, facilitate adaptation to climate change and provide wider ecosystem services; and
- link with any existing landscape-scale initiatives in the vicinity, and/or with other recognised areas for enhancement (such as biodiversity opportunity areas).” (NIA 2, p 3).

In addition to these features, NIAs must also have or be able to create all aspects of a functioning ecological network as discussed in Section 2.2.1 and put forth by the Lawton Report (Lawton et al, 2010). The NIA Guidance Notes (NIA 1) suggest that potential core areas might be comprised of certain designations including, but not limited to, SSSIs, NNRs and LNRs. Given that the Lawton Report (Lawton et al, 2010) did not provide any strict biophysical criteria for ERZs, the NIA recommendations are examined critically with consideration for the policy drivers of the respective areas and the dual mandate of win-win opportunities for both wild nature and ecosystem service delivery, in the context of other landscape designations in England and with reference to the three management categories introduced in Section 4.2.2.

The NIA land / area criteria can be organised into five categories of biophysical features: size; land use; core areas; ecosystem service provision, which has a series of sub-categories discussed shortly; and links to / overlap with landscape-scale initiatives including AONBs or NPs. The category of ecosystem service provision, as derived from the Lawton Report (Lawton et al, 2010) and referenced by the NIA Criteria (NIA 2) and Guidance Notes (NIA 1), is focused on five ecosystem services which are agricultural production, carbon, water quality, inland and coastal flood management and recreation / access. As the provision of ecosystem services is really more of an implementation consideration, this is more appropriately discussed later in this work and thus can be found in Section 5.5. Each of the remaining criteria (size, land use, core areas and links to existing landscape-scale initiatives) are examined
in the following sections. As context is required in order for any quantitative features of the individual NIAs to carry meaning, it is, where appropriate, provided by also reporting on the features for other landscape areas in England, namely the 32 AONBs and 10 NPs located around the mainland of England.

Size

The NIA Guidance Notes (NIA 1) suggests a size of between 10,000 and 50,000 hectares unless a bid can make a convincing argument for falling outside those size guidelines. There is no source reference for this range, but the Guidance Notes (NIA 1) suggest that the restriction results from limited resources and a shorter timeframe as opposed to other considerations. The NIAs are smaller landscape designations on average than either the AONBs or NPs, as seen in Figure 4.3, but, given the local emphasis and shorter timescale, this is not surprising. The main consideration with regard to the size of the NIAs is how different areas approached the criteria during the competition process and its potential impacts on outcomes of the NIA Initiative, particularly given the limited resources.

Figure 4.3 A plot illustrating the range of sizes for the various individual NIAs, AONBs and NPs as well as the average size for each.

The NIAs ranged from just over 10,000 hectares in the case of Marlborough Downs to approximately 72,500 hectares in the case of Northern Devon. Figure 4.4
illustrates the various sizes of the NIAs as well as the minimum and maximum recommended sizes as per the NIA Guidance Notes (NIA 1). Three NIAs ultimately exceed the 50,000-hectare maximum size recommendation. Birmingham and the Black Country justified their choice by focusing on the area covered by their biodiversity partnership and local ecological records centre. Greater Thames Marshes adjusted their size after they had been granted the funding; “We went right up to 49,999 on the first application. Then afterwards we said we’ve got to include these Essex bits for political reasons, and they agreed, and we amended the boundary,” (Interview). The Northern Devon NIA was focused on a particular catchment, namely the River Torridge catchment.

There were a number of factors that impacted the physical areas that partnerships selected for their bids. NIAs in Management Groups 1 and 2, by and large, used the focuses of those partnerships to select their landscape areas; in total, 9 out of 12 NIAs said the landscape areas were based on the areas of importance for their partnerships. This does include two areas from Management Group 3, Birmingham and the Black Country and Nene Valley; both partnerships focused on areas already prioritised by their lead partners. The three NIAs which were not developed solely based on the boundaries of areas already overseen or prioritised by partnerships were Northern Devon, in Management Group 2, which chose a subset of the existing Biosphere Reserve to prioritise and two in Management Group 3: Greater Thames Marshes (previously discussed) and Marlborough Downs. Marlborough Downs was an entirely new partnership predominantly based upon the land of the privately owned / managed farms of the farmers directly involved in the NIA Initiative bid.
The selection of formal boundaries, however, was approached differently by various NIAs, which emerged in the analyses as potentially a feature of their existing management structures or contexts. Several NIAs in Management Groups 1 or 2 reported considering the size and boundaries of their areas of influence as an NIA to be fluid depending upon circumstances. The boundary was essentially considered to be merely a formality. “[the area that we] had identified was just under the 50,000, it was 46,000, 48,000 or something like that, it's in the plan. To be honest, it's one of those things you have to have a boundary, but it wasn't actually very important in a way…We very much wanted a lot of the education work and community work to be wider.” (NIA iv). Furthermore, some NIAs did adjust their area of influence during the 3-year period of the initiative to allow for focus on areas outside the original boundaries.

In contrast, the two areas in Management Group 3 who discussed their area selection indicated that they took a much more rigid approach to the criteria, the implication being that it was a means to make them more competitive for the bid process. However, upon learning that other NIAs had not stuck strictly to the size recommendations, one NIA in this group adjusted its boundaries after the original selection process as well, stating “We had a big debate about the designation of the area, because we had to agree between us and [the other stakeholder] how we were going to divvy that up…I found out later that actually other NIAs just didn’t care about
The area. They just put in what they thought was a good area. We were very strict because we wanted to win the money.” (NIA x). Ultimately, to some NIAs, the size criteria was perceived as an additional barrier in the application process.

The management context is again important with regard to the selection criteria put forth by the NIA literature and its impact on the areas making bids for NIA funding. The over-arching goal of the Lawton Report (Lawton et al, 2010) and the ERZs is to improve the ecological network over large areas. The guidelines set forth by the NIA Guidance Notes (NIA 1) and Criteria (NIA 2) heavily impact the types of areas which are able to effectively apply for the initiative and which are selected to participate (further explored in Section 5.1). On one hand, areas which are rigidly controlling for the size of their NIAs might omit key focal areas for their local ecological networks. However, a large size, meaning one above the upper limit, also involves some considerations with regard to available resources. Three NIAs have areas greater than the upper recommended size limit of 50,000 hectares; that is 25% of the 12 areas. Given the shorter time-period of the NIA Initiative and the limited funding (discussed in Section 4.6), this is potentially a disadvantage as the same funding will necessarily be spread over a larger area; it is also the stated reason for imposing a size-limit recommendation in the NIA Guidance Notes (NIA 1). The willingness to select a larger NIA would also indicate a preference for existing or formal partnerships in the application process, as they were more likely to embrace larger areas or consider their area of influence a fluid concept which could be expanded if necessary.

Land use

Land use has a substantial impact on the ability of landscape area to provide opportunities for biodiversity conservation and ecosystem service delivery, as touched on in Section 4.1. The land use of the NIAs is explored here in the context of the management categories previously discussed in Section 4.2.2 and with consideration for the dual mandate of biodiversity conservation and ecosystem service delivery. In this section, land use, for clarity, is divided into three categories: priority habitat, agricultural and urban / suburban or built-up land use. This is done for ease of analysis based upon the UK geo-spatial land use data but also because it provides a good basis for examining the potential impacts on ecosystem service delivery. Agricultural land use and urban / suburban land use are some of the biggest components of land use as discussed in section 4.1 but the different land use
categories also interact and impact potential delivery of a variety of ecosystem services.

The NIAs, on average, have a smaller percentage of their area which is priority habitat when compared to the averages for either AONBs or NPs, and thus a larger percentage of their area on average which is agricultural and / or built-up. This is shown in Figure 4.5. Thus, when examining the land use in individual NIAs, areas in Management Group 1 have more priority habitat and less of their area which is agricultural or built-up land use.

**Figure 4.5 Land use in NIAs as compared to AONBs and NP.**

![Land use in NIAs as compared to AONBs and NP.](image)

*Source: created by author using NIA, AONB and NP shapefiles and land use data (Table 4.4).*

Areas in Management Group 2 tend to have less priority habitat and more of their area as agricultural or built-up land use than areas with landscape designations but more priority habitat than areas in Management Group 3. This is shown in Figure 4.6.
While overlapping with an existing landscape designation can provide an advantage, it is not the only factor which impacts area of priority habitat, a key indicator used throughout the NIA Initiative. To explore this, an analysis was run to examine the area of priority habitat in the NIAs as compared to a random sample of areas in England of the same size as the specific NIA in question. Six NIAs have a larger area of priority habitat than might be expected when compared to a random selection of areas of the same size in England. This includes all four areas in Management Group 1 but also two areas, one each, from Management Groups 2 and 3. Three are no different with regard to priority habitat when compared to a random selection of areas of the same size in England and three have less priority habitat when compared to a random selection of areas of the same size in England. This is shown in Table 4.5.
Table 4.5 Assessment of statistically significant differences between actual priority habitat within the NIAs and priority habitat in randomly sampled areas of the same size in England. Red indicates an NIA with significantly less priority habitat, yellow an NIA that is no different and green an NIA with significantly more priority habitat when compared to randomly sampled areas.

<table>
<thead>
<tr>
<th>NIA</th>
<th>Actual Area of PH</th>
<th>Relationship</th>
<th>Avg PH: Randomly Selected Areas</th>
<th>t-test p-value</th>
<th>sign test p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birmingham and the Black Country</td>
<td>3,738</td>
<td>&lt;</td>
<td>8,117</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Dark Peak</td>
<td>21,257</td>
<td>&gt;</td>
<td>3,886</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Dearne Valley</td>
<td>1,348</td>
<td>&lt;</td>
<td>2,272</td>
<td>p &lt; 0.01</td>
<td>p = 0.54</td>
</tr>
<tr>
<td>Greater Thames Marshes</td>
<td>18,378</td>
<td>&gt;</td>
<td>6,903</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Humberhead Levels</td>
<td>8,997</td>
<td>&gt;</td>
<td>6,680</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Morecambe Bay</td>
<td>20,978</td>
<td>&gt;</td>
<td>6,321</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Marlborough Downs</td>
<td>666</td>
<td>&lt;</td>
<td>974</td>
<td>p &lt; 0.01</td>
<td>p = 0.31</td>
</tr>
<tr>
<td>Meres and Mosses</td>
<td>1,753</td>
<td>&lt;</td>
<td>4,655</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Northern Devon</td>
<td>6,914</td>
<td>&lt;</td>
<td>8,164</td>
<td>p = 0.02</td>
<td>p = 0.50</td>
</tr>
<tr>
<td>Nene Valley</td>
<td>2,840</td>
<td>&lt;</td>
<td>5,443</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>South Downs</td>
<td>10,872</td>
<td>&gt;</td>
<td>5,375</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
<tr>
<td>Wild Purbeck</td>
<td>14,277</td>
<td>&gt;</td>
<td>5,944</td>
<td>p &lt; 0.01</td>
<td>p &lt; 0.01</td>
</tr>
</tbody>
</table>

Source: Created by author using NIA shapefiles (Table 4.4) and PH data (Table 5.7).

Some individual NIAs highlighted their predominant land uses and acknowledged the benefits or challenges associated with these features. Birmingham and the Black Country is a predominately urban trust which was an important feature in their bid. As part of their business application, they highlight that it is “the largest urban area in the UK” (BBC BP, p 1) and a “unique opportunity to engage the 2.2 million people who live and work within the area” (BBC BP, p 1).

Marlborough Downs is also of note; it falls under Management Group 3 as a newly formed partnership, but it does in fact overlap heavily with another landscape designation, although it does not include a landscape management body in the partnership. Despite this, it has the smallest area of priority habitat for its size of all the NIAs and less than would be expected when compared with random areas of the same size in England. Essentially, the management context of being a newly formed partnership in which individual farmers were key partners resulted in the larger landscape area as well as the focal areas within that landscape to predominantly emphasise agricultural land. Marlborough Downs also acknowledged the unique features of their area with their bid. “none of these organisations, [the other NIAs], they’re not farmers and they can’t get to do anything without the farmer. Without the landowner. So, they are wasting the space. And we wanted to prove the farmer can do it without people telling us what to do. So, it’s what they call ‘bottom-up led’. Okay?
It’s quite unique, it’s the only one.” (Interview). South Downs also has quite a bit of agricultural land use and emphasised their good relations with private landowners as fundamental to their approach as well. This illustrates the importance of exploring the impact of management context on the area selection and the biophysical features associated with those choices.

The emphasis on varied land uses in the NIA literature does present some considerations with regard to trade-offs between biodiversity and ecosystem service delivery as well as between certain ecosystem services discussed in Section 4.1. However, it also opens up the NIA application and larger conservation process to areas with, perhaps, more non-traditional land use features. The Lawton Report (Lawton et al, 2010) emphasises space for nature with surrounding areas managed in a wildlife-friendly way; NIAs which are overwhelmingly agricultural or built-up will present more difficulties for achieving this goal. However, incorporating areas which are largely agricultural or built-up does potentially help involve a variety of people in the conservation process and dialogue, perhaps achieving that sought-after step-change in nature conservation, even if such areas are not necessarily able to completely prioritise space for nature as emphasised in the Lawton Report (Lawton et al, 2010).

Core areas

Core areas are the key sites in an ecological network which are intended to provide high quality space for nature. In the NIA Initiative in England, these core sites are often made up of various small protected area designations as discussed in Section 3.5.1.

These core areas of designated sites were the focal point for many NIAs, around which their specific areas of focus were designed; this is true for NIAs from all three management groups. The core areas helped NIAs direct their efforts when historic partnerships traditionally operated over larger spaces. In some cases, it required refining the focus and eliminating certain protected areas. “Basically, it was a case of starting by drawing a line around the designated site, including a bit in the south where there was a very specific water quality problem but no designated sites, and then making that line a bit more bubbly. It really was, when you look at the designated- There really is only one more really major site that we could have put in, and it was so far removed from everything else that it would have been far too difficult.” (NIA vii).
However, the extent of core areas that each of the NIAs contain and their relative contributions to England’s ecological network with regard to priority habitat and priority species (both previously discussed as key indicators in the NIA Initiative in Chapter 3) varies and is likely impacted by the management context of the areas. NIA work predominantly focuses on maintaining existing sites as discussed above although there was some habitat creation; this is likely because the NIA Initiative was focused on priority habitat which is predominantly covered by existing designations of core sites (Lawton et al, 2010). Given the importance of core sites to the coherence and resilience of an ecological network, an exploration of the core areas both within the NIAs in general, as compared to the AONBs and NPs, and between different NIAs provides important information with which to explore the Initiative.

NIAs, when compared to NPs, have a smaller proportion of their land also designated as small protected areas, 28% versus 20% as seen in Figure 4.7 (it should be noted that this is calculated using percentages to account for the varied sizes of the landscape areas). However, NIAs actually have a higher average proportion of their land designated as small protected areas on average when compared to AONBs, which come in at 17%.

Figure 4.7 Comparison of area of individual landscape designation also designated as a small, protected area designation for NIAs, AONBs and NPs.

Source: created by author using NIA and small protected area shapefiles (Table 4.4).
Despite the fact that NIAs have a slightly higher percentage of their area designated as small core areas when compared with AONBs, this varies between NIAs. NIAs which overlap heavily with a landscape designation have a larger percentage of their areas also designated as SSSIs, the most common type of small protected area, as demonstrated by Table 4.6.

Table 4.6 Percentage of area of individual NIAs also covered by SSSI designation by management group.

<table>
<thead>
<tr>
<th>Management Group</th>
<th>Percentage of NIA also covered by SSSI designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Group 1 - Landscape management body as key partner</td>
<td>83%  22%  10%  23%</td>
</tr>
<tr>
<td>Management Group 2 - Formal Partnership</td>
<td>&lt;1%  15%  2%  1%</td>
</tr>
<tr>
<td>Management Group 3 - Formal and informal or new</td>
<td>2%  41%  4%  5%</td>
</tr>
</tbody>
</table>

Average - Management Group 1 34%
Average - Management Group 2 5%
Average - Management Group 3 13%

Source: created by author using NIA and small protected area shapefiles (Table 4.4).

It should be noted, however, that the expanse of area also designated as a protected area does not necessarily speak to the quality of the sites. To provide some insight into quality, the proportion of their area that is priority habitat and the priority species richness was also examined for individual NIAs, AONBs and NPs. NIAs in Management Group 1 do in fact have more priority habitat for their areas and a higher priority species richness than areas in Management Groups 2 or 3, as can be seen in Figure 4.8. In other words, areas in Management Group 1 appear to have an advantage with regard to the area of priority habitat and species richness within them when compared to areas which do not overlap with a landscape designation.
Core areas are a key feature of both the Lawton Report (Lawton et al, 2010) recommendations and the NIA Guidance Notes (NIA 1) and Criteria (NIA 2). The emphasis on connections with landscape designations in the NIA Initiative approach likely provides some advantage with regard to core areas in that areas with landscape designations could also have a larger percentage of their area designated as core areas for wildlife, particularly if they overlap with a national park, more priority habitat and a higher priority species richness. However, emphasising such landscape areas does not necessarily facilitate the most cohesive or resilient ecological network, a key feature of the Lawton Report (Lawton et al, 2010) recommendations. An examination of the connectivity to address the NIAs’ contribution to the coherence of England’s ecological network is discussed in Section 5.4.

Linkages to landscape-scale initiatives

NIA connections with AONBs, NPs and other landscape initiatives have been touched throughout Sections 4.2 and 4.3. This section here is used as a means to sum up the arguments of this thesis with regard to the impact of landscape designations and other strategies developed from the existing management and biophysical contexts on the NIAs. Essentially, areas which have as a stakeholder a landscape management body, like those that oversee the AONBs or NPs, as well as other landscape initiatives
without an associated designation, are perceived to have had an advantage with regard to the NIA Initiative bidding process.

While encouraging connections with existing partnerships and landscape designations, as the NIA Initiative does, likely embodies areas with potential to enhance the ecological network, it is not necessarily facilitating a coherent or resilient ecological network nor is it automatically involving others in the conservation dialogue as it concentrates resources on areas where work is focussed and ongoing. In contrast, however, the NIA Guidance Notes (NIA 1) and Criteria (NIA 2) emphasis on including a variety of land uses does potentially open the conservation process to areas not as often offered such opportunities, a key feature of the Lawton Report (Lawton et al, 2010) recommendations. However, it also overlooks the potential trade-offs between biodiversity conservation, the focus of the Lawton Report (Lawton et al, 2010), and ecosystem service delivery.

4.4 Recommendations for action: how to achieve the ERZs and NIAs

This section examines and compares the recommendations for action of both the ERZs (Lawton et al, 2010) and the NIAs as presented in the NIA Guidance Notes (NIA 1) and Criteria (NIA 2). The key recommended actions for ERZs as stated by the Lawton Report (Lawton et al, 2010) are focused on the core areas of the ecological network:

- “Improve the quality of current sites by better habitat management.
- Increase the size of current wildlife sites.
- Enhance connections between, or join up, sites, either through physical corridors, or through ‘stepping stones’.
- Create new sites.
- Reduce the pressures on wildlife by improving the wider environment, including through buffering wildlife sites.” (Lawton et al, 2010, p 66).

However, in addition to the actions focused on improving core areas, there are 24 recommendations put forth by the Lawton Report (Lawton et al, 2010) which involve all features of the ecological network, both core areas and the wider surroundings. These 24 recommendations address the various actions necessary to achieve a coherent and resilient ecological network in England. Some have already been touched on in previous sections. Furthermore, not all recommendations are directly related to either the ERZs or the NIAs. However, this section examines those that are, particularly those related to the identified actions or directions presented in the NIA
Guidance Notes (NIA 1). There are 14 recommendations from the Lawton Report discussed here and 26 bullet points from the NIA Guidance Notes (NIA 1) recommendations for Activities / Direction. This work uses document analysis to compare the 14 recommendations from the Lawton Report (Lawton et al., 2010) to the 26 Activities / Direction points in the NIA Guidance Notes (NIA 1). As previously discussed, the ERZ and NIA designations were intended to be adapted to the local needs of the different areas. Thus, the range of recommended actions is quite extensive and not all are relevant to any one landscape area.

First of all, however, a note on the actions presented in the NIA Guidance Notes (NIA 1). The actions or directions presented in the NIA Guidance Notes (NIA 1) are not well-written. There is a considerable amount of overlap between different points, several typos and limited thought given to clarity or categorisation. It is, essentially, a rather rough draft of ideas or suggestions. As a result of this, the relevant recommendations of the Lawton Report (Lawton et al., 2010) and the bullet points as provided by the NIA Guidance Notes (NIA 1) have been organised into a table in order to better examine and compare them; the categories were implemented specifically for this work but were derived from the policy drivers discussed in Section 4.1 and informed by their original sources, namely the Lawton Report (Lawton et al., 2010) for the ERZs or the NIA Guidance Notes (NIA 1) for the NIAs. This data is presented in Table 4.7. The Lawton Report (Lawton et al., 2010) recommendations are first categorised into five groups: core sites, larger ecological network, ecosystem services, planning, innovation and monitoring. Core sites deals with actions or directions for areas specifically designated for nature and with the main purpose of enhancing nature; the larger ecological network deals with areas around these core sites intended to improve connectivity or provide buffer zones; ecosystem services deals specifically with improving ecosystem service delivery; planning with actions that connect with other initiatives and work towards improving the larger ecological network; innovation with economically-focused endeavours, in this case payments for ecosystem services or biodiversity offsetting; and, lastly, monitoring deals with the monitoring recommendations for the undertaken actions to assess impact. All recommended actions or directions from the NIA Guidance Notes (NIA 1) are also grouped into those same categories and presented side by side with the Lawton Report recommendations. In this way, it is possible to examine the priorities and emphases of both the Lawton Report (Lawton et al., 2010) and the NIA Initiative with regard to their activities. It should be noted that funding is not addressed in this section but in Section 4.6 nor are any recommendations from the Lawton Report (Lawton et
al, 2010) which have been touched on previously covered again here. Also of note is that one recommendation might potentially be placed in multiple categories; however, in this work, the primary purpose of the recommendation ultimately drives its categorisation. An action’s primary purpose is determined by its placement within the original literature, the Lawton Report (Lawton et al, 2010) for the ERZs or the NIA Guidance Notes (NIA 1) for the NIAs. For example, Recommendation 7 (Lawton et al, 2010, p 76) might reasonably be considered under the category of either Core sites or Ecosystem services in Table 4.7. This work places the recommendation under the category of Ecosystem services because in the Lawton Report (Lawton et al, 2010), the recommendation falls within a section titled “Identifying and protecting ecosystem services” (p 72), sub-section “Natural spaces for people” (p 76).
Table 4.7 Recommended actions for ERZs and NIAs.

<table>
<thead>
<tr>
<th>Category</th>
<th>Lawton Report Recommendations</th>
<th>NIA Activities or Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core sites</td>
<td>Recommendation 9. The government should ensure that the remaining areas of high conservation value that currently are not well protected are effectively safeguarded.</td>
<td>Improve existing wildlife sites, including SSIS and Local Wildlife Sites (e.g. improving the area in favourable or recovering condition).</td>
</tr>
<tr>
<td></td>
<td>Recommendation 11. The recent progress in improving the management of SSISs must be sustained, with the aim of moving the condition of sites from ‘recovering’ to ‘favourable’.</td>
<td>Provide opportunities to existing wildlife sites and other network components, particularly those identified as national or local biodiversity priorities (such as hedgerows and rivers).</td>
</tr>
<tr>
<td></td>
<td>Recommendation 12. Local authorities should take responsibility for the identification and monitoring of Local Wildlife Sites and the management of LWS must be improved.</td>
<td>Priority area habitat expanded, restored and under management; as separate restoration areas (new wildlife sites), as an extension to existing wildlife sites.</td>
</tr>
<tr>
<td>Larger ecological network</td>
<td>Recommendation 19. Habitat creation by government and its agencies, granting trusts, businesses and the voluntary sector requires greater focus on the needs of ecological networks, in particular the need to contribute to Ecological Restoration Zones.</td>
<td>Improve areas of non designated wildlife habitat or bring these under conservation management.</td>
</tr>
<tr>
<td></td>
<td>Recommendation 21. Public bodies and other authorities responsible for canals, railways, roads, cycle ways and other linear features in the landscape, should ensure that they better achieve their potential to be wildlife corridors, thereby enhancing the connectivity of ecological networks, and improving opportunities for people to enjoy wildlife.</td>
<td>Area of habitat, or extent of other habitat features, additionally created or restored which increases ecological connectivity and reduces habitat vulnerability to future change and how cost effective this has been.</td>
</tr>
<tr>
<td>Ecosystem services</td>
<td>Recommendation 4. Public bodies and statutory undertakers planning the management of water resources should: • make space for water and wildlife along rivers and around wetlands; • restore natural processes in river catchments, including in ways that support climate change adaptation and mitigation; and • accelerate the programme to reduce nutrient overload, particularly from diffuse pollution.</td>
<td>The natural world contributes to people's quality of life enhancing well-being and health.</td>
</tr>
<tr>
<td></td>
<td>Recommendation 5. Authorities responsible for measures to reduce the risks from coastal erosion and flooding should do so in ways that enhance ecological networks where possible. This can be achieved by taking full account of the natural dynamism and functioning of the coast, thereby allowing wildlife and habitats to move and evolve.</td>
<td>Establishing more robust ecological networks will help to secure benefits for more people, particularly in towns and cities where more than 80% of us live and where disconnect with nature is often greatest.</td>
</tr>
<tr>
<td></td>
<td>Recommendation 6. Government should produce a strategy to ensure that we protect and secure multiple benefits from our carbon-rich soils and peatlands, and maximise their contribution to ecological networks.</td>
<td>Projects aiming to benefit wildife through enhancing ecological processes should also be able to deliver local landscape character and cultural association demonstrating significant benefits to local communities.</td>
</tr>
<tr>
<td></td>
<td>Recommendation 7. Responsible authorities should take greater steps to reconnect people to nature by enhancing ecological networks within urban environments, including wildlife-friendly management of green spaces, and by embedding biodiversity considerations in the need to adapt to climate change.</td>
<td>Demonstrate significant benefits to Local Communities, integrating environmental enhancements alongside economic growth and/or providing an up-lift in economic value.</td>
</tr>
<tr>
<td>Planning</td>
<td>Recommendation 1. Local authorities should ensure that ecological networks, including areas for restoration, are identified and protected through local planning. Government should support local authorities in this role by clarifying that their biodiversity duty includes planning coherent and resilient ecological networks.</td>
<td>Through improved quality of life, enhancement of health and well-being.</td>
</tr>
<tr>
<td></td>
<td>Recommendation 2. Planning policy and practice should: • continue to provide the strongest protection to internationally important sites and strong protection from inappropriate development to SSISs; • provide greater protection to other priority habitats and features that form part of ecological networks, particularly Local Wildlife Sites, ancient woodland and other priority BAP habitats.</td>
<td>Enhance the functioning of ecological process and wider ecosystem services including carbon sequestration and water management.</td>
</tr>
<tr>
<td>Innovation</td>
<td>Recommendation 17. The government should promote economic approaches that will favour conservation management by stimulating the creation of new markets and payment for ecosystem services, to ensure that the values of a wider range of ecosystem services are taken into account in decisions that affect the management and use of the natural environment.</td>
<td>The government should promote economic approaches that will favour conservation management by stimulating the creation of new markets and payment for ecosystem services, to ensure that the values of a wider range of ecosystem services are taken into account in decisions that affect the management and use of the natural environment.</td>
</tr>
<tr>
<td></td>
<td>Recommendation 22. If a formal system of biodiversity offsets is to be introduced, pilot schemes should be established to test and refine its operation, to ensure it meets the conditions we have set out for a safe and effective system.</td>
<td>Integration of biodiversity and ecological enhancement alongside economic growth.</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Recommendation 24. The Secretary of State for the Environment, Food and Rural Affairs should be advised on progress against recommendations in this report after two years, with a full evaluation of the outcomes for England's ecological network after five years.</td>
<td>An innovative approach to the NIA projects for example payment for ecosystem services or piloting biodiversity offsets.</td>
</tr>
</tbody>
</table>

Source: Derived using data from Lawton Report (Lawton et al, 2010) and NIA Guidance Notes (NIA 1). Categories were imposed for this analysis to provide clarity for document analysis and comparison but were derived from the policy drivers discussed in Section 4.1.
Of the five categories of recommended actions and / or directions, less time is spent examining the core sites and larger ecological network categories as these are very similar to both one another and the section on policy drivers. More attention is paid to the ecosystem service, planning, innovation and monitoring categories where more notable differences between the approaches of Lawton Report (Lawton et al, 2010) and the NIA Guidance Notes (NIA 1) arise.

When examining the recommendations for action / direction with regard to core sites and the larger ecological network, the Lawton Report (Lawton et al, 2010) and NIA Guidance Notes (NIA 1) are very similar, though the focuses are flipped: the Lawton Report (Lawton et al, 2010) is focused on the core areas while the NIA Guidance Notes (NIA 1) emphasise the wider ecological network which supports these core spaces. Nonetheless, they are broadly similar, particularly as many of the recommendations in the NIA Guidance Notes (NIA 1) are repetitive. The scale of focus is more local in the case of the NIA Guidance Notes (NIA 1), which is to be expected given the consideration of variation between local areas. The emphasis is similar, however, stressing the protection and improvement of existing priority sites and habitats as well as the creation of new designations where appropriate along with improved buffering and connectivity of these core spaces.

The ecosystem service recommendations in the Lawton Report (Lawton et al, 2010) specifically address water management including water quality as well as flooding and coastal erosion, carbon storage and cultural services broadly in equal measure across four recommendations. While the NIA Guidance Notes (NIA 1) touch on water resource management and carbon sequestration, more emphasis is placed on cultural ecosystem services; in fact, of the seven bullet points, six deal directly with the health and well-being as well as cultural associations of the local communities for their landscapes, although one point does touch on economic values. Essentially, cultural ecosystem services are focused on far more in the NIA Guidance Notes (NIA 1) than in the Lawton Report (Lawton et al, 2010). This is interesting because while there are some synergies between wild nature conservation and delivery of cultural ecosystem services, there are drawbacks as well, which are touched upon in Section 4.1 of this chapter and which are not addressed by either the Lawton Report (Lawton et al, 2010) or NIA Guidance Notes (NIA 1) or Criteria (NIA 2).

Of the seven bullet points in the Planning category from the NIA Guidance Notes (NIA 1), about half deal with linking the NIA Initiative to other landscape initiatives. In contrast, the Lawton Report (Lawton et al, 2010) emphasises planning an effective
network by identifying areas for restoration and which require ongoing protection, focusing on core sites. This includes local authorities clarifying and incorporating their “biodiversity duty” (Lawton et al, 2010, p 71) into the local planning approaches, a nod to the importance of councils, which often are key participants in the NIA partnerships. The NIA Guidance Notes (NIA 1), however, emphasises means for identifying priority areas using, for example, NEA evidence or biodiversity opportunity areas and chances for working towards the objectives of multiple initiatives like the England Biodiversity Strategy, UK Geo-diversity Action Plan or the Water Framework Directive (WFD). The emphasis placed on linking with other initiatives also perhaps highlights a challenge for the NIAs: accessing data and other evidence including local-scale information, particularly in areas where there was no existing partnership or where partnerships were informal or had a slightly different geographic focus. This refers back to Section 4.2 which discusses the benefits of having an existing partnership and associated resources.

Perhaps the starkest contrast occurs when examining the varied recommendations with regard to Innovation. The Lawton Report (Lawton et al, 2010 makes two recommendations regarding innovation, specifically addressing PES and biodiversity offsetting, both of which were also presented as examples of innovation in the NIA Guidance Notes (NIA 1). When examining the recommendation for PES, the Lawton Report (Lawton et al, 2010) suggests promoting economic approaches which favour conservation management so that the value of a wider range of ecosystem services is considered when making decisions that impact the management and use of the natural environment. The Lawton Report (Lawton et al, 2010) acknowledges that, in some cases, “Some people are prepared to pay a premium for products that bring benefits for wildlife” (p 83) and thus “If we take into account the potential values of a broad range of ecosystem services, the benefits of establishing and managing a coherent and resilient ecological network could, in many situations, outweigh the costs many times over.” (Lawton et al, 2010, p 83). Again, however, this approach is putting the needs of wild nature first, emphasising the establishment and management of a coherent and resilient ecological network. The prioritisation of wild nature is not necessarily as apparent in the NIA Guidance Notes (NIA 1) which advocates economic growth as well as ecological enhancement, referring to the “Integration of biodiversity and ecological enhancement alongside economic growth.” (p 11).

The contrast is even greater when examining biodiversity offsetting. The Lawton Report (Lawton et al, 2010) approaches biodiversity offsetting with caution, stating
that the possibility should be explored but with due regard to the conditions set out by the report for “a safe and effective system” (p 88). The Lawton Report (Lawton et al, 2010) particularly highlights risks that “biodiversity offsetting could undermine ecological networks if they lead to any reduction in the levels of protection afforded to wildlife sites and habitats” (p 87). The conditions for a safe and effective system are not discussed further here but mentioned in an effort to highlight the emphasis on due regard for wild nature. The NIA Guidance Notes (NIA 1), however, almost throw the idea of biodiversity offsets out without any further recommendations for how such a system might be implemented. Furthermore, as part of the recommended actions, the NIA Guidance Notes (NIA 1) suggest offsets as a potential source of income for the continued funding for NIAs; “Demonstrate how benefits will be sustained after funding ends; including recognition in local planning; fundraising proposals or funding streams identified and funding secured beyond public sector funding, including innovation such as offsets; recognised uplift in economic value” (p 11). Essentially, it is in no way treated with the caution emphasised by Lawton et al (2010).

There is only one recommendation in the Lawton Report (Lawton et al, 2010) and two in the NIA Guidance Notes (NIA 1) regarding Monitoring. The Lawton Report (Lawton et al, 2010) recommendation, for which the monitoring action is the final suggestion, is quite broad, stating only that “a full evaluation of the outcomes for England’s ecological network” (p 90) will be necessary after 5 years. This is not unexpected as the Lawton Report (Lawton et al, 2010) was addressing all the ecological network(s) of England and thus is, by design, quite broad. However, those in the NIA Guidance Notes (NIA 1) are equally broad, stating that the NIA monitoring and evaluation procedures should be in place prior to the second stage of the competition and that they must be in “compliance with standard monitoring and review processes supported by the agreed standard mechanisms in the Biodiversity Action Reporting Scheme (BARS) and/or the National Biodiversity Network (NBN)” (p 12). There are a number of considerations when examining these actions. First, it is likely to be difficult for areas with less formal partnerships and, perhaps, fewer resources to design and put in place a suitable monitoring system in such a short period of time as that in which the competition was run; timing is discussed in more detail in Section 5.1 and monitoring in Section 5.5. Secondly, the mechanisms of the BARS and NBN systems are for biodiversity data, not data for other features of sustainable land management as emphasised by the NIA Guidance Notes (NIA 1). Finally, if each area designs its own monitoring and evaluation procedures, it is likely to be difficult to scale such data up and examine outcomes for all 12 areas or the larger ecological network in England.
as recommended by the Lawton Report (Lawton et al, 2010). The monitoring and evaluation procedures of the NIA Initiative are dealt with in more detail in Chapter 5 which examines the implementation of the Initiative. However, problems with the design of the Initiative are noted here so as to lay groundwork for further analysis.

Ultimately, the recommended actions of the Lawton Report (Lawton et al, 2010), when compared with those in the NIA Guidance Notes (NIA 1), serve to illustrate further the fundamental differences in the two approaches. The aims may be broadly the same, improve natural spaces and systems to benefit people, but the changes in approach with regard to the recommended actions means the primary goal of ensuring better quality space for nature has the potential to be over-shadowed, a consideration which is discussed further in Chapter 6 regarding the outcomes of the NIA Initiative.

4.5 Desired outcomes: What the ERzs, NIAs and individual areas hoped to achieve

This section examines the national and local motivations and desired outcomes for the NIA Initiative. The national desired outcomes are discussed first, ERzs then NIAs, followed by the local motivations and desired outcomes. The motivations for the individual NIAs were examined in the context of the existing management structures as introduced in Section 4.2. There seems an assumption by the designers of the NIA Initiative that partnerships or areas would undoubtedly be interested in such initiatives as the NIA program. This is likely true when there is money involved and indeed, approximately 70 applications were submitted for 12 openings (CEP, 2015a). However, understanding the motivations behind the bids and the desired outcomes of the individual areas can be important, particularly in implementing initiatives over a longer period and ensuring that national outcomes are achieved.

The overwhelming goal of the Lawton Report is to achieve a coherent and resilient ecological network, which the report identifies as follows:

“Compared to the situation in 2000, biodiversity is enhanced and the diversity, functioning and resilience of ecosystems re-established in a network of spaces for nature that can sustain these levels into the future, even given continuing environmental change and human pressures,” (Lawton et al, 2010, p vi).

To achieve this goal, the Lawton Report (Lawton et al, 2010) presents “five big messages” (p 69), the last of which is dealt with here. The other four have been touched on throughout the other sections of Chapter 4, namely the management and
condition of England’s core / designated wildlife sites; proper planning of ecological networks; the management and condition of important sites for wildlife that are not currently protected as core sites for wildlife, and the potential for win-win opportunities for wild nature conservation and ecosystem service delivery. The last of the big messages touches on the fact that a “step-change” in nature conservation will not be possible without the active participation of society. The Lawton Report (Lawton et al, 2010) notes that to implement such actions as described throughout this chapter and improve wild nature conservation in England, it is important that society see this as “necessary, desirable, and achievable” (Lawton et al, 2010, p 69). Furthermore, while the means for achieving this step-change are not always obvious, the report states that “There are many things that society has to do that may seem to have rather little to do with nature conservation, but could have, or even should have if we embrace more radical thinking. There are many more win-wins that we are currently not making the most of, representing a waste of resources.” (Lawton et al, p 69). To achieve this step change in the way in which society thinks about wild nature, the report suggests that “strong leadership from government”, collaboration between various actors, “education, explanation, and empowerment” are all essential but that it “cannot be ‘top-down’” (Lawton et al, p 69). Furthermore, such endeavours need to be long-term in perspective.

The NIA Monitoring and Evaluation Final Report (CEP, 2015a) states the desired outcomes of the NIA Initiative as follows:

- “become much better places for wildlife – creating more and better-connected habitats over large areas which provide the space for wildlife to thrive and adapt to climate change;
- deliver for people as well as wildlife – through enhancing a wide range of benefits that nature provides us, such as recreation opportunities, flood protection, cleaner water and carbon storage
- unite local communities, land managers and businesses through a shared vision for a better future for people and wildlife. The hope is that they will become places of inspiration, that are loved by current and future generations.” (p 5)

The aims of the NIA Initiative for wildlife and for people are very similar to those in the Lawton Report (Lawton et al, 2010), though again, as seen with the policy drivers discussed in Section 4.1, with more emphasis on benefits for people over benefits for nature. There is, however, little emphasis on improving or changing the understanding of society with regard to the importance and value of nature. The importance of community engagement in achieving the step-change in nature conservation is mostly addressed, though not by any means completely covered, by
the third desired outcome. Furthermore, even though the third outcome briefly touches on this “shared vision” (CEP, 2015a, p 5), the expectation of achieving a change in the understanding of the value of nature to society in just three years is unreasonable. If the importance of changing society’s understanding of the value of nature was largely overlooked at a national level in the NIA Initiative, what, then, were the motivations of the individual areas for participating in the NIA Initiative and their desired outcomes, particularly with regard to wider society in England? Furthermore, what insights do these motivations provide on whether the NIA Initiative achieves the goals set out by the Lawton Report (Lawton et al, 2010) for the ERZs?

In order to explore the motivations of the individual NIAs, respondents were asked the following question: can you tell me about the initial interest in taking part in the NIA Initiative? Each respondent provided multiple answers. The question was not intended to achieve an exhaustive list of all the reasons why the individual areas were interested in the program but to assess the main motivations for submitting a bid. The motivations and desired outcomes for participation in the NIA Initiative as reported by the respondents were classified into five categories for analysis. These are as follows: National profile, Improvements to the ecological network, a Bottom-up approach, Integrated management and Financial features. The category of National profile refers to the desired widespread recognition of the program and the original 12 areas selected, specifically the acknowledgement of the areas as important spaces for nature. The category of Improvements to the ecological network examines challenges identified in the existing ecological network of spaces for nature and a desire to address those gaps. Bottom-up approach refers to the emphasis on a bottom-up approach led by stakeholders from the local communities. Integrated management refers to the emphasis on the entire ecological network, the bridging of different aspects of the current approach to conservation. The category of Financial features refers to any aspect of the funding cited as a major motivation behind the application, which is further separated into three categories; General financial is used when it is a non-specific reference to the funding, Flexibility is used when the diverse nature of the funding was mentioned and Just another funding mechanism for when the NIAs cite the initiative as a means to carry on work which was already on-going in their areas. All of the NIAs had more than one motivation for participation and the responses are indicative of the most significant motivations for the managers behind their applications but do not constitute an exhaustive list. Furthermore, there is no consideration of relative importance; all reasons cited are given equal value in the
The breakdown of motivations for the individual NIAs can be seen in Figure 4.9.

Figure 4.9 NIA motivations for participation in the Initiative (in % NIAs)

*NIAs were asked the question – Can you tell me about the initial interest in taking part in the NIA Initiative? For each NIA interviewed, the respondent was able to provide multiple answers. N = 4 in each group.

Each of the motivations is discussed in turn along with primary data from the semi-structured interviews. National profile was quite important for NIAs without a landscape designation, that is NIAs that fall into either management context group two or three. As one NIA in Management Group 1 stated “I think the decision was that this is an important habitat. It doesn’t get recognised enough, which means that the NIA was a real opportunity to make that push to be able to say to people like HLF, “Look how important this is, Defra have said it’s 1 of the 12 most important landscapes of these 80 bids they got in.” (NIA viii). The sense of selectivity was a key point for several of the NIAs. Another NIA took it a step further and mentioned the benefits of Profile for achieving further investment: “This area of [specific county] is not the richest area of the lot, it’s not the most well-known of the lot. It’s an area that not many people come to unless they live here. So, getting that investment and interest in the area, recognition for the area has been brilliant.” (NIA viii).
Interest in addressing problems with the existing ecological network was identified as a key motivator in four of the NIAs, two of which include a landscape designation and two of which were largely informal or new partnerships. One NIA said the existing designations overlooked certain habitat types. Another highlighted problem with areas under HLS and ELS management. “Just because a lot of the areas are in Environmental Stewardship, the Higher-Level scheme, or the Entry Level scheme, doesn’t mean to say it’s being looked after and properly managed. And I think our concern, and to a point, frustrations, was there were all these areas of [specific habitat type], which is one of the key, most important habitats of the [specific landscape designation], and they were still, we felt, very much in decline. Although they were in stewardship, that wasn’t enough.” (NIA iv). In most cases, the concern with problems with the existing ecological network and approach is presented as a challenge of managing land for the benefit of wild nature as well as for agricultural purposes.

The challenge of managing land for the benefit of wild nature as well as for agriculture ties in with the next motivation category of bottom-up approach which is the desire cited by many of the NIAs to achieve wider community engagement in conservation work, particularly landowners / managers, in other words, a shift from purely a top-down approach to more of a bottom-up one. This, too, was specific to management context categories one and three; three NIAs with a landscape designation and two NIAs with largely informal or new partnerships identified the potential for a more bottom-up approach as a key factor in their interest in the Initiative. As one NIA stated, “I think it’s the farmers that drive this. Not these bodies in here. I mean, they’re not going to achieve anything unless they own the land.” (NIA xi). The engagement of landowners and managers has been discussed throughout the other sections of this chapter and thus is not discussed in further detail here.

The Integrated management category, best summed up as belief in the objectives and the overarching goals of the Lawton Report (Lawton et al, 2010), was mentioned as a key reason for making a bid for the Initiative by a number of NIAs from all management context categories. This is unsurprising given that the NIA Initiative was derived from the recommendations of the Lawton Report (Lawton et al, 2010). “The attraction of the Nature Improvement Area philosophy, if you like, is very much an integrated approach and innovative approach.” (NIA viii). However, what is of note is the fact that the NIAs were all interested in the landscape approach, the integration of the different aspects of land management for the benefit of wild nature and people, over what they hoped would be a longer period of time. “You’re talking landscapes and you’re talking ecology; it doesn’t work in three-year cycles.” (NIA iv). The key
emphasis is the long-term approach because, as many of the NIAs from the first two management context categories stated, the NIAs encompassed work that likely would have been undertaken in some capacity irrespective of the NIA Initiative; funding would have been sought elsewhere, regardless, though perhaps in a more piecemeal way.

This leads into the financial motivations for participating in the NIA Initiative. Ten NIAs mentioned the funding, in some respect, as an important motivation for applying for the Initiative although it is likely funding was an important motivation for all 12 NIAs. What is interesting about funding as a motivating factor for the individual NIAs is the way in which it was discussed by NIAs with varied management contexts. A general mention of the benefit of funding was largely a feature of the NIAs in Management Group 3. The flexibility of funding, however, was noted only by NIAs from one of the first two Management Groups, likely a feature of their experience with funding mechanisms stemming from the existing partnerships. Flexibility in funding is further discussed in Section 7.3 but introduced here to illustrate the importance of management context.

Finally, a number of NIAs, including all the NIAs from the first management context category and one NIA from the second, expressed that this was merely the next funding stream for their ongoing aspirations as partnerships. All were quite frank about this motivation, which provides key insights into the current approach to conservation and underlines key differences between the vision of the Lawton Report (Lawton et al, 2010) and the NIA Initiative approach as well as between the national objectives and the local motivations within the NIA Initiative. This is perhaps summed up by the following statement: "What we’re trying to do is have a long-term vision and then look at slotting in funding streams as they become available to try and contribute towards that long-term vision really. (NIA iv). This funding structure and approach is discussed in further detail in the immediately following Section 4.6. What emerges from this assessment of the individual NIA motivations is their obvious hope for a longer term, landscape-scale approach that allows for improvements to the existing ecological network and wider community engagement in the conservation process, very much along the lines of the Lawton Report’s (Lawton et al, 2010) original ideals. However, there is also an undercurrent of understanding, particularly by areas with existing partnerships with experience in managing landscape areas, that the NIA Initiative is likely merely another short-term step in a longer-term management strategy.
4.6 Funding recommendations: Comparing the ERZs and the NIAs

This section examines the funding recommendations for the ERZs as described by the Lawton Report (Lawton et al, 2010) and compares them to the structure ultimately put in place for the funding of the NIA Initiative (NIA 1). In examining the funding recommendations, the timing and length of the programs are also discussed as the funding recommendations in both cases were designed for a specific length of time. The Lawton Report’s (Lawton et al, 2010) recommendations are discussed first. The funding approach of the NIA Initiative is then examined. The funding recommendations for the NIA Initiative are most clearly addressed by the fourth section of the NIA Criteria (NIA 2): Sustainability of Outcomes and Value for Money, which outlines the Initiative's expectations for the NIAs with regard to the financial investment.

The Lawton Report (Lawton et al, 2010) provides their financial recommendations near the end of the document on almost the last page in a section titled “Money Matters” (p 90). The Lawton Report (Lawton et al, 2010) estimated £0.25 million in the first year and £0.5 million for each subsequent year per ERZ of which it recommended 12. Funding should be provided, according to the report, for “at least 5 years” (Lawton et al, 2010, Table 8, p 91). Thus, the sum amounts to £3 million for the first year and £6 million for each of the four subsequent years totalling £27 million. This is all the information provided regarding the financial recommendations for the 12 ERZs detailed by the Lawton Report (Lawton et al, 2010).

The NIA Initiative took a different approach when compared with the Lawton Report (Lawton et al, 2010) recommendations with regard to funding; the Initiative provided a total grant fund of £7.5 million to be invested in 12 areas over three years, after which time the areas were to be self-sustaining with regard to their finances. The areas were also to seek funding from other sources throughout the Initiative to complement the government's investment. As previously mentioned, the financial approach of the NIA Initiative is best examined by understanding their criteria for “Sustainability of Outcomes and Value for Money” detailed in the NIA Criteria (NIA 2) document. The NIA Criteria (NIA 2) data states that the selection committee was seeking areas which demonstrate “long-term sustainable benefits and value for money” (NIA 2, p 5) using the following criteria:
• “community and civil society involvement in the NIA design and delivery of proposed activity;
• a well-supported & functioning partnership with key delivery partners committed to action and with a shared vision;
• use of non-public sector resources (e.g. volunteers, landowners and private sector investment);
• how benefits will be sustained after funding ends. This might include recognition in local planning; fundraising proposals; funding secured from outside the public sector, innovative funding sources such as payments for ecosystem services or biodiversity offsets;
• significant benefits to local communities, integrating environmental enhancements alongside economic growth and/ or providing an uplift in economic value;
• shared learning and dissemination of expertise within and beyond the NIA pilots.” (NIA 2, p 5)

Some of these criteria have been touched on in previous sections, namely community and civil-society involvement, a well-supported and functioning partnership and significant benefits to local communities. Others, however, provide insight into the government’s approach to NIA funding, namely the “use of non-public sector resources” and “how benefits will be sustained after funding ends”. The Lawton Report (Lawton et al, 2010) was clear in its recommendation that the program should provide funding for a minimum of five years and yet the NIA Initiative was funded, at a drastically reduced rate, for only three years. All of the NIAs were successful in attracting other funding and adding value while the Initiative was on-going. It should be noted that added value in the Final Monitoring and Evaluation Report (CEP, 2015a) includes a variety of sources such as volunteer time and in-kind contributions. These measures were self-reported, and the measurement strategy changed between Years 1 and 2. As a result of these considerations, only cash contributions are used in the following analyses. When examining added cash value, there is a disparity between the amount of funding achieved in addition to the grant contribution by those NIAs with existing designations or partnerships and those NIAs with informal partnerships or no partnership at all. Figure 4.10 shows the added cash value for the three different management context groups. There is significant variation within the groups, and it is a small sample size but those NIAs with a landscape designation do, on average, have a higher Added Cash Value than the other two management groups regardless of the committed government funding.
Three NIAs deviate from this trend, however. Figure 4.11 shows the initial grant and the added cash value for the individual NIAs in Year 1. Birmingham and the Black Country NIA and Nene Valley NIA, both areas without formal partnerships, sourced comparatively large sums of funding, resulting in amounts similar in magnitude to those NIAs with landscape designations. In contrast, the added cash value achieved by Wild Purbeck NIA, an NIA with a landscape designation, was significantly smaller when compared to other areas which included a landscape designation. This examination of funding speaks to the same tension, previously discussed in Section 4.2, within the ecological network of designations in England and which was highlighted by several of the NIAs: areas with existing designations are perceived as more able to attract funding than those areas without designations.
The NIA Initiative began at a time when accessing funding for conservation was increasingly challenging as a result of government austerity measures, as both members of the overseeing public bodies (personal conversations) and a number of NIAs reported; “in terms of a UK approach it came at a time when, really… You know, the backdrop of it is, actually, to cuts in funding towards nature conservation.” (NIA i). The success of NIAs in contributing “added value” from other funding sources was largely attributed by the NIAs to the government backing of the Initiative and when the initial three-year funded period ended, support from other sources also waned. “The real reality is if you haven’t got funding to keep these things going, it’s not just about implementation and delivery, it’s about influence. People come to the table because they want to get near the money. If you haven’t got any money, as soon as the money walks out the door, then so do all the people.” (NIA x). Sourcing funding following the NIA Initiative also proved challenging for many NIAs despite the fact that they were meant to be self-sustaining after the initial three-year period. A detailed discussion of the future of the NIA Initiative is presented in Section 7.3. However, an understanding of the funding, particularly in light of the Lawton Report (Lawton et al, 2010) recommendations and management context, is presented here. The difficulty in attracting continued funding for the areas was likely due to several factors but management context does play an important role. One NIA in Management Group 3 described the difficulty in accessing funding even after the recognition of the NIA.
Initiative: “The reason I think they got [funding] is because they had an existing partnership which was a community forest. So, [specific funding body] were confident that they had an office, people on the ground, whereas they weren’t confident of us, we didn’t have an office.” (NIA x). Indeed, three years is a very short time in which to become self-sustaining financially for any area, even if there is an existing partnership.

4.7 Conclusions

Finding 1: The Lawton Report (Lawton et al, 2010) and the NIA Initiative have different policy priorities, with the Lawton Report (Lawton et al, 2010) focusing specifically on the restoration of ecological form and function in the ecological network in England while the NIA Initiative is focused on both benefits for people and wildlife.

There is a fundamental difference in both the definitions of and objectives for the ERZs and the NIAs; the ERZs prioritise the improvement of ecological systems, working towards a more coherent and resilient ecological network which results in benefits for wild nature while the NIAs are focused on sustainable use of wild nature which encompasses a dual mandate for benefits for people and wildlife. While many of the objectives are similar, the NIA Initiative puts far more emphasis on achieving benefits for people and win-win situations than does the Lawton Report (Lawton et al, 2010). Furthermore, the Lawton Report’s (Lawton et al, 2010) addressing of ecosystem service delivery and win-win scenarios is limited in scope, brief and inconsistent and the consideration of trade-offs between wild nature conservation and ecosystem service delivery is almost non-existent. This is similarly true of the NIA Initiative, which identifies, verbatim, only those four ecosystem services touched on by the Lawton Report (Lawton et al, 2010). Of the four ecosystem services addressed, only one prioritises space for nature, specifically inland water management. Recreation, carbon and coastal management all prioritise the service equally or over space for nature and none of the services discussed consider any potential trade-offs between wild nature conservation and ecosystem service delivery. This divergence in policy drivers of the ERZs and the NIAs carry through the entire design of the NIA Initiative.
Finding 2: The NIA Initiative emphasised a top-down approach which focused on existing partnerships and connections with landscape designations. This is in contrast to the wide partnership of local people envisioned by Lawton et al (2010) which was conceived, perhaps unrealistically, to be a bottom-up effort supported by individual citizens as well as groups from across the local communities. Furthermore, the management context has implications for the biophysical characteristics of the areas as management context impacts the selection of both wider landscapes and focal areas within those landscapes.

The ERZ and NIA literature detail similar lists of the types of potential stakeholders to be involved in the respective initiatives but the Lawton Report (Lawton et al, 2010) presents a broader, more inclusive approach that works from the bottom-up involving individual citizens as well as the top-down which is in contrast to the predominantly top-down strategy of the NIA Initiative. Analysis of data triangulated from a variety of sources reveals that the NIA Initiative emphasis on existing partnerships and connections with landscape initiatives benefits certain types of areas with largely formal partnerships in place when making NIA bids. The management context in many ways drove the selection of the wider NIA area as well as the focal areas within the wider landscape and ultimately, the biophysical characteristics of an area. By reinforcing existing partnerships who favoured connections with known partners, the NIA initiative ultimately limited its potential to achieve the desired step-change by restricting wider community involvement.

Finding 3: In emphasising existing partnerships, the NIA Initiative also potentially limited innovation by promoting stakeholder groups with strong lead bodies largely inclined to continue with their own agendas and management strategies.

Lawton et al (2010) envisioned a change in the current approach to conservation in order to facilitate a step-change and improve space for wild nature. In contrast, the NIA Initiative in its design ultimately promoted existing approaches to conservation. In terms of management context, having an existing partnership, particularly one which included a landscape designation management body, provided a strong base from which to launch an NIA bid as 1) NIA partnerships were largely a feature of the existing management structures as indicated by 8 NIAs, 2) the lead bodies coordinated the participation of other groups, generally preferring those with whom a working relationship was already established, and 3) lead bodies or steering groups
of core organisations decided on the strategic vision of the NIAs which is derived from the priorities of those organisations. The NIA Initiative process, by emphasising areas which are already generally involved in the conservation dialogue, provides additional barriers to areas where landscape management is informal and more fragmented, areas where a step-change might potentially be achieved. Essentially, the Initiative ultimately somewhat limited the scope for innovation by facilitating bids from areas and partnerships with established working practices and objectives.

Finding 4: The NIA Initiative does not constitute an adequate interpretation of the Lawton Report’s (Lawton et al, 2010) recommendations for the ERZs given the divergence in policy drivers, varied emphases for recommended actions and deviation in desired outcomes as well as the inadequate consideration of the required time and financial resources necessary to implement the program.

The NIA Initiative is very similar in many respects to the recommendations put forth by the Lawton Report (Lawton et al 2010) for the ERZs but there are some fundamental differences between the two programs. The ERZ recommendations emphasise space for nature, a coherent and resilient ecological network focused on restoring the ecological systems and processes which underpin the ecosystem services on which people depend. The NIAs emphasise sustainable use of nature, promoting a dual mandate of benefits for people and nature. This difference in approach is clear throughout the policy drivers, recommended actions and, to some extent, the desired outcomes. This disparity is further emphasised by the short-term nature of the Initiative and limited funding, which ultimately prevented the NIA Initiative from being an effective interpretation and implementation of the ERZ program as put forth by the Lawton Report (Lawton et al, 2010) but also from achieving the desired step-change in nature conservation as envisioned by Lawton (Lawton et al, 2010).
5 Assessing the implementation of the NIA Initiative

This chapter presents an assessment of the implementation of the NIA Initiative in England, from the competition for the selection of the winning bids to the design and implementation of the monitoring system. While the Final Monitoring and Evaluation Report (CEP, 2015a) provides some insight into the execution of the NIA Initiative, it omits a detailed examination of three items: the competition and selection process; the objectives and targets of the individual NIAs; and the monitoring system, particularly the framing and selection of the indicators included. Furthermore, there is almost no discussion at all of synergistic outcomes between biodiversity conservation and ecosystem service delivery beyond to say “Reflecting the integrated approach, all NIA activities related to enhancing or creating habitats or encouraging local people to engage with the natural environment, will have also enhanced ecosystem services.” (CEP, 2015a, p xi). Examining the implementation process and understanding precisely what worked well in the Initiative and where aspects of the program were not as effective as intended can provide valuable information on how to improve future initiatives and achieve the step-change sought by Lawton et al (2010).

This chapter aims to better understand the strengths and weaknesses of the NIA Initiative as it was implemented, with particular consideration given to the initiative’s achievement of its own goals, which were as follows:

- “Opportunities to deliver ecological networks, both in terms of large area and scale and valuable benefits to wildlife and people, are particularly high;
- A shared vision for the natural environment exists among a wide partnership of local people, including statutory and voluntary sectors;
- Significant improvements to the ecological network can be achieved over large areas by enlarging and enhancing existing wildlife sites, improving ecological connectivity and creating new sites;
- The surrounding land use can be better integrated with valued landscapes and action to restore wildlife habits and underpinning natural processes, helping to adapt to climate change impacts.
- Benefits to urban area and communities can be achieved and, where appropriate, NIAs may contain urban areas as part of an enhanced ecological network;
- ‘Win-win’ opportunities are identified and have the potential to be exploited to the full to derive multiple benefits, for example with benefits for the water environment and Water Framework Directive objectives, flood and coastal erosion risk management and the low-carbon economy;
- There are opportunities to inspire people through an enhanced experience of the outside world,” (NIA 1, p 5).

Furthermore, this chapter considers the NIA Initiative’s progress towards the step-change described by Lawton et al (2010) and reiterated by the NIA Initiative (e.g. NIA 1, p 5; NIA 2, p 1), the new, approach to ecological restoration which rebuilds nature and creates a more resilient natural environment. The analysis in this chapter addresses research question two: Did the NIA Initiative, as the program was implemented at both national and local scales throughout the three-year period, meet its own objectives towards achieving a “step-change” in nature conservation?

As mentioned in Chapter Three, understanding initiatives such as the NIA program requires an interdisciplinary framework which integrates quantitative, biophysical and qualitative, social data. This chapter demonstrates a mixed methodological approach which utilises both document analysis of the individual NIA applications and government reports (Table 3.2), primary data from the semi-structured interviews and national, GIS biophysical data (Table 4.4 and 5.7) to analyse the success or otherwise of the NIA program as it was implemented in achieving the “step-change” in conservation sought by the Lawton Report (Lawton et al, 2010). By better recognising the importance of the management context in the individual NIAs and examining not only what but how outcomes were or were not achieved, the analysis provides new insights into the interlinkages between biodiversity conservation, ecosystem service delivery, land use and management in the NIAs.

The chapter is structured along the following research objectives:

Section 5.1 investigates the execution of the competition at national and local levels and the initial stages of implementation, specifically examining the assessment and selection process using qualitative, primary data from the semi-structured interviews conducted with people from the individual NIAs as well as data from many of the documents in Table 3.2. This section triangulates data by exploring local perspectives of the NIAs and how their experiences provide insight into the implementation of the program and ultimately the Initiative’s ability to meet its own goals.

Section 5.2 explores the objectives and targets of the individual NIAs as stated in their business plans submitted as part of the second stage bid process, particularly the framing of the individual NIAs’ strategies for the implementation of the NIA Initiative
in their respective areas and the breakdown of the objectives into biodiversity targets and/or ecosystem service targets.

Section 5.3 examines the national monitoring system that was eventually implemented (the monitoring system was run in parallel with the delivery in hopes that the experiences of the NIAs could help shape the approach) and assesses the effectiveness and efficiency of the areas in implementing the national system at local scales. It particularly focuses on the framing of ecosystem services as a concept and the impact of this framing on the indicators selected. It further considers the system in the context of exploring synergies and trade-offs between biodiversity conservation and ecosystem service delivery and providing data in the long-term.

Section 5.4 considers the contribution of the NIAs, at both national and local levels, to the connectivity and buffering of the existing ecological network in England, both key objectives of the NIA Initiative.

Section 5.5 explores the potential win-win scenarios for both biodiversity conservation and the delivery of certain ecosystem services at a landscape-scale and in the individual NIAs and then examines the results with consideration for the stated goals of the individual areas and those of the Initiative as a whole.

Section 5.6 concludes this chapter with an overview of the key findings.

5.1 The NIA Timeline

This section examines the timeline of the NIA Initiative. It starts with an exploration of the competition process and the experiences of the individual NIAs in Section 5.1.1, paying particular attention to the impact of management context on the experiences of the individual areas. It then continues in Section 5.1.2 with a broad-scale examination of the implementation of the NIA Initiative over the three-year period from April 2012 to April 2015, specifically exploring how the NIAs perceived the implementation process and its impact on their achievement of both local and national objectives of the NIA Initiative. Section 5.1 is specifically examining whether the NIA Initiative met its own needs in terms of its first two objectives, namely:

- Opportunities to deliver ecological networks, both in terms of large area and scale and valuable benefits to wildlife and people, are particularly high;
A shared vision for the natural environment exists among a wide partnership of local people, including statutory and voluntary sectors (NIA 1, p 5).

It should be noted that while the NIA objectives presented above are provided in their original order, Objective 2 is actually addressed first in Section 5.1.1 while Objective 1 is addressed in 5.1.2. This stems from the impact of the competition process, which is discussed first so as to present NIA implementation in a linear fashion, on the ‘wide partnership’ addressed in Objective 2. To aid in these analyses, a timeline of the NIA Initiative can be seen in Figure 5.1.
<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>Making Space for Nature by Lawton et al. (2010) which described the need for a coherent and resilient ecological network that prioritised restoring the processes which underpin ecosystems and the services they provide for people.</td>
</tr>
<tr>
<td>2011</td>
<td>UK Natural Ecosystems Assessment, published in June 2011, it assessed the value of the UK’s natural environment by taking account of the economic, health and social benefits people derive from nature.</td>
</tr>
<tr>
<td>2011</td>
<td>Biodiversity 2020, published in August 2011, it was a biodiversity strategy for England which built on the Natural Environment White Paper and set out the strategic direction for biodiversity policy over the following decade on land (including trees and lakes) and at sea.</td>
</tr>
<tr>
<td>2011</td>
<td>Nature Improvement Area Competitive Grant Scheme Guidance Notes provided the overview of the competition process and the guidelines for partnership applications.</td>
</tr>
<tr>
<td>2011</td>
<td>NIA Criteria provided physical and partnership criteria for high-quality bids interested in the competitive grant scheme, outlining what types of partnerships could apply and what physical features an area might have, types of activities that prospective NIA would be expected to undertake and sustainability of outcomes / value for money.</td>
</tr>
<tr>
<td>2011</td>
<td>Expression of interest application due in by September 30th 2011.</td>
</tr>
<tr>
<td>2011</td>
<td>Stage 2 Business Plan application due in by December 16th 2011.</td>
</tr>
<tr>
<td>2012</td>
<td>Natural Environment White Paper, The natural choice: securing the value of nature, published in June 2011, it outlined the government’s vision for the natural environment over the subsequent 50 years. It also described actions that would be taken to deliver that goal, including announcing the NIA initiative competition.</td>
</tr>
<tr>
<td>2012</td>
<td>Nature Improvement Area Competitive Grant Scheme Guidance Notes provided the overview of the competition process and the guidelines for partnership applications.</td>
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</tr>
<tr>
<td>2012</td>
<td>1st Best Practice Network Event in September.</td>
</tr>
<tr>
<td>2012</td>
<td>2012-2013: First NIA Competitive Grant Scheme.</td>
</tr>
<tr>
<td>2013</td>
<td>3rd Best Practice Network Event is held in September.</td>
</tr>
<tr>
<td>2013</td>
<td>4th Best Practice Network Event is held in February.</td>
</tr>
<tr>
<td>2014</td>
<td>3rd Best Practice Network Event is held in September.</td>
</tr>
<tr>
<td>2014</td>
<td>4th Best Practice Network Event is held in February.</td>
</tr>
<tr>
<td>2016</td>
<td>5th Best Practice Network Event is held in February.</td>
</tr>
<tr>
<td>2016</td>
<td>2016: Final NIA Network Event is held in February.</td>
</tr>
<tr>
<td>2015</td>
<td>2015: 5th Best Practice Network Event is held in February.</td>
</tr>
<tr>
<td>2016</td>
<td>2016: Final NIA Network Event is held in February.</td>
</tr>
</tbody>
</table>
5.1.1 Individual NIA perspectives on the competition process: partnership structures

Section 4.2 demonstrated that the NIA Initiative emphasised established partnerships in its NIA Criteria (NIA 2), which had three consequences:

1) NIA partnerships were largely a feature of the existing management structures;
2) The existing partnerships coordinated the participation of other groups or stakeholders which included the involvement of landowners; and
3) Lead bodies or steering groups of core organisations decided on the strategic vision of the NIAs which is derived from the priorities of those core organisations.

This conflicts with the “consortia” (Lawton et al, 2010, p 72) of stakeholders with a shared vision described by Lawton et al (2010), as was discussed in Section 4.2. However, it also goes against one of the main NIA Initiative policy drivers, the “wide partnership of local people” described by NIA Objective 2 (NIA 1, p 5). Chapter 4 explored the design of the Initiative; Chapter 5 examines the implementation and exacerbation of the trends previously identified. The impacts of the short timeline on stakeholder involvement in the NIA partnerships are presented here.

“‘I’m quite amazed we actually managed to get through all the hurdles really. I think if we hadn’t had that partnership in existence we would have struggled to get to that point.’” (NIA xii) The preceding quote is quite indicative of the general perceptions of the NIAs regarding the competition process of the Initiative. Of the 12 NIAs, 11 noted that the competition process and lead-up to the implementation had been quite rushed and 9 specifically discussed the rapid but complex application process for the competition, a challenge also acknowledged at the national level by Natural England. The short time period in which to put forth an application resulted in a number of challenges for the NIAs, particularly having to quickly form a partnership and agree to a business plan detailing the objectives of the NIA. This was particularly true of NIAs in Management Group 3, which were largely informal or new partnerships prior to the NIA Initiative. Rushing partnership formation meant that many NIAs limited who was involved, relying on existing relationships with trusted partners and thus conflicting with key stated priorities of the NIA Initiative identified in NIA Objective 2,
namely the wide partnership of local people. Particular observations of the key challenges as highlighted by respondents in this work are discussed below along with their impacts on the initiative’s overall goal of achieving a step-change in nature conservation.

“We had a few weeks to do an application form,” (NIA iii) – The NIA Initiative competition process was divided into three sections: an initial Expression of Interest; a second-stage, detailed business plan which set out the details of the NIA including partnership, stakeholders, objectives, targets, monitoring and financial details; and a third-stage presentation. NIAs could be knocked out after each stage and the entire process was quite competitive; out of approximately 76 applications, only 12 were chosen. Furthermore, although the windows in which to submit the various aspects of the application process were perceived to be short, the process was laborious and likely provided an edge to existing partnerships with a management plan already in place, namely those NIAs in Management Groups 1 or 2. This brief window for application had knock-on effects.

"We actually had to move quickly and couldn’t have a big consultation on what we were doing," (NIA x) – The short competition process limited the ability of some NIAs to consult widely to develop a shared vision as described by NIA Objective 2 or draw in additional partners and stakeholders. Five NIAs specifically mentioned limiting participation to facilitate decision-making in and management of the application process. Most NIAs, as discussed in Section 4.2, focused stakeholder involvement on organisations already involved in the existing partnerships but the strenuous competition timeline likely further limited participation in the partnerships. Involving individual or groups of landowners / managers was particularly difficult as a result of the short time-period for the application according to three NIAs; “There wasn’t enough time to involve people in it enough. The application process was, like, three months or something like that. A load of the farmers were going, ‘Well, what does that mean to us,’ and didn’t buy into it,” (NIA i). Essentially, the short window for putting forward an application resulted in many of the NIAs limiting partnership participation in order to be able to organise themselves quickly. The emphasis on existing or known partners was particularly apparently in Management Groups 1 and 2 as those partnerships, already somewhat formal in nature, might otherwise have drawn in new groups.
5.1.2 NIA perceptions of the implementation process

This section examines the implementation of the NIA Initiative at a broad scale and the impacts of the implementation process on the progress towards the first and, likely, primary goal of the program: to implement NIAs particularly in areas where large scale and “valuable benefits for wildlife and people” were achievable. In fact, as the primary goal of the NIA Initiative, the achievement, or lack thereof, of Objective 1 is addressed throughout Chapter 5 but this section specifically examines the impact of the timescale of the Initiative on progress towards this objective. It first examines the presentation of the Initiative in the NIA Guidance Notes (NIA 1) and NIA Criteria (NIA 2) to explore whether the NIA program was really developed as a long-term Initiative. It then explores the perceptions of the individual NIAs of the program. Figure 5.2 provides an illustration of the challenges associated with the design and implementation process according to individual NIAs.

Upon exploring the intentions for the program as demonstrated by NIA Guidance Notes (NIA 1) and the NIA Criteria (NIA 2), it emerges that the Guidance Notes (NIA 1) were very clear that the program was to be funded for a short, 3-year period of time: “The NIA Grant Scheme (The Scheme) will operate over 3 years from 2012 to 2015. Its aim is to enable action on the ground to achieve the shared vision of a coherent and resilient ecological network in up to 12 NIAs,” (NIA 1, p 5). What is interesting about this statement is the fact that it specifies its aims to achieve on the ground action, not maintain a long-term program, despite being the introduction to the scheme in the document. Later in the NIA Guidance Notes, there is the following statement: “By the end of March 2015 the NIAs will have been established, securing changes in the ecological network making the area bigger, better and more joined up, providing tangible benefits to the environment, economy and to society,” (NIA 1, p 10). There is, however, no explanation of what ‘established’ means in this context, no indication of whether or even how the NIAs were to continue long-term which seems a glaring omission. One final statement from the NIA Criteria (NIA 2) provides some clarity on expectations of the NIAs in the long-term in its ‘Sustainability of Outcomes and Value for Money’ section of the NIA Criteria document; the NIAs were to demonstrate “how benefits will be sustained after funding ends. This might include recognition in local planning; fundraising proposals; funding secured from outside the public sector, innovative funding sources such as payments for ecosystem services or biodiversity offsets,” (NIA 2, p 5). Future funding was also emphasised in conversations with contacts at Natural England specifically noting that the NIAs were
able to use resources to develop bids for future funding opportunities. What is absent, however, is any meaningful expectation of the program itself continuing in the long term; instead, the benefits of the program were to continue, not, it seems, necessarily the NIAs themselves. Essentially, the NIA Initiative was designed and implemented as a short-term program, the areas merely “pilots” (NIA 1, p 17; NIA 2, p 5); there does not seem to have been any expectation of the program itself continuing long-term, merely the benefits.

So how did the NIAs understand and experience the implementation of the NIA Initiative? Eleven NIAs mentioned the short-term nature of the program in their discussion of the implementation of the Initiative as seen in Figure 5.2.

**Figure 5.2 NIA perceptions on the problems with the NIA Initiative design and implementation process.**

*NIAs were asked the question - What are your overall thoughts on or experience with the NIA initiative? Are there any particular strengths / weaknesses to the NIA Initiative? For each NIA interviewed, the respondent gave multiple responses (e.g. an NIA might mention timing, the monitoring system, problems engaging with landowners, etc). N = 4 in each group.*

Their views can be broken down into three categories or themes which provide a clear understanding of their experiences throughout the three-year implementation period and of the Initiative as a whole:

1) “It has been a really frantic three years, you couldn’t keep that up indefinitely,” (NIA iv): the timeline was such that most of their attention was focused on
meeting the short-term requirements of the program, not implementing processes for the long-term.

2) “I think we quickly realised that it wasn’t going to deliver what we thought it was,” (NIA x). As a result of the short implementation period and rushed nature of the NIA Initiative, it was perceived particularly by Management Groups 1 and 2 more as ‘just another funding opportunity’ than a true execution of a long-term, landscape-scale program.

3) “You can’t do landscape scale conservation in three years because it needs constant attention,” (NIA ii). A landscape approach is, by design, is an integrated approach that is meant to provide for both people and wildlife but to achieve such benefits, management must be continuous.

Several of the NIAs found it challenging to set up in so short a period, particularly given that the program was only to run for three years, something also noted at the national level. After set-up, there was the monitoring and the fast-paced delivery of objectives. The short time-period for implementation then had knock on effects for aspects such as collaboration, particularly given the diversity of the individual areas and elaborate, landscape-scale scope of the program; "There wasn't much time for development and thinking across the country, I felt anyway because everybody was very focused on having to deliver their programme, which by their very nature, were quite ambitious programmes," (NIA ii). The short-term nature of the program meant that NIAs focussed very much on meeting their specific objectives and targets along with other program requirements, to the detriment of other considerations such as collaboration, both within the Initiative itself with other NIAs as well as outside the Initiative with other programs. This is addressed further in Chapter 6 which explores the outputs and outcomes of the Initiative.

The short period also impacted how the individual NIAs perceived the Initiative as a landscape program. Firstly, expecting to achieve measurable, landscape-scale results after three years is unlikely, a challenge also recognised at the national level; long-term ecological data, considered to be longer than ten years, are often essential for quantifying ecological responses to environmental change (Lindenmayer et al, 2012) such as habitat creation and restoration, the foundation of the NIA Initiative objectives for achieving a coherent and resilient ecological network. This challenge is clearly acknowledged by the Final Monitoring and Evaluation Report: “Many outcomes and impacts of the NIA partnerships’ activities and wider NIA programme are only expected to be seen in the longer-term,” (CEP, 2015a, p 41). Secondly, three-years does not allow much time for fixing problems in the Initiative, of which
there were many, particularly with the monitoring system which is discussed in Section 5.3. As one NIA sums up the feelings of the NIAs regarding the timeline, "there wasn’t really that long for anyone to do anything to then say, 'This worked well, this didn’t go well,’ to inform how everyone else did anything. By that point you were kind of at the end of the three years and by which point everyone has kind of gone different ways in how to try and continue something that had lots of funding that’s gone to no funding," (NIA xii). The three-year nature of the program essentially resulted in a rushed implementation and, as a result, a less effective program than might otherwise have been achieved. Indeed, even the Final Monitoring and Evaluation Report (CEP, 2015a) mentioned the problems with the short-term nature of the program; “88% of respondents considered NIAs to have contributed to Lawton’s vision, though a three year timescale was deemed too short to achieve large scale and lasting improvements.” (NIA IX, p xvi).

The impact of the short time frame was amplified for areas without a formal existing partnership, those in Management Group 3, particularly with regard to set-up in the first year. "We set up initially because we didn’t have any structure. We didn’t have a bank account, nothing. And we had a year of hell," (NIA xi). Given the emphasis in the NIA Guidance Notes (NIA 1) on “partnerships established in England” (p 7), the lack of consideration with regard to the need to set-up the program is not unexpected. However, some NIAs understood the lack of a formal partnership to be an anticipated feature of the NIAs, which speaks to the disconnect between national and local understandings. Thus, the resulting challenge of setting up on such a short timeline and lack of consideration for areas without formal partnerships which would likely require additional time to establish themselves is in contradiction to the stated long-term, large-scale objectives of the Initiative. This approach also results in an emphasis on areas with ongoing programs, largely associated with Management Groups 1 and 2, as discussed throughout Chapter 4, an essential feature of another NIA objective, an “enhanced ecological network” (NIA 1, p5). However, the short timeframe was such that an existing partnership such as those in Management Groups 1 and 2 did not necessarily provide an edge during the latter stages of the implementation of the on-the-ground strategies. “The fact that they knew each other, in terms of delivery as well, there was a level of trust within the partnership that, if it was brand new... It takes a little bit of time for people to understand each other, and things like that. I think that was definitely a big advantage. In the end, it didn’t necessarily help get the momentum of delivery going quickly,” (NIA vi). The short-term approach emphasised by the NIA Initiative at a national level led to the NIAs
ultimately understanding the program as merely the next funding opportunity thus perpetuating a ‘more of the same’ conservation approach as opposed to the step-change sought by the Initiative.

Lawton et al, in the 2010 report Making Space for Nature emphasised the concept of a step-change in nature conservation, away from focusing on small protected areas and towards a more integrated, landscape approach that provided a cohesive and resilient ecological network. The Natural Environment White Paper (Defra, 2011b) further emphasised a landscape approach, stressing the need for sustainable use of natural resources for the benefit of both people and nature. Lawton et al (2010) summed up their message in four points to specifically address the critical need to make space for wild nature: “more, bigger, better and joined” (p viii). Perhaps there should have been a fifth point: longer. Within the report, Lawton et al (2010) are clear that the step-change should be a long-term strategy: “we are laying out a long-term strategy, a desired ‘direction of travel’, and a set of general principles to guide conservation action in England over the next 40 years.” (Lawton et al, 2010, p 3). However, this seems to have been lost in the implementation of the NIA Initiative, noted by contacts at Natural England as long-term ambition undermined by short-term funding and policy.

The perceived short-term approach of the NIA Initiative, in contrast to the landscape-scale impact sought, was noted as a problem by several of the NIAs across all three management groups. As one NIA sums it up, “That uncertainty and the short-termism was the main barrier I would have said to really being successful with that long-term approach,” (NIA ii). The NIA Initiative not only incapacitated itself with regard to its own agenda by rushing the implementation of the program, it also missed a critical aspect of landscape-scale conservation; it is implemented and maintained over time. This short-term approach, out of step with partnerships already operating at a landscape-scale over a period of many years in some cases, though arguably with mixed results, caused the Initiative to be perceived by some as merely another funding opportunity for their established partnerships and management strategies, not a real investment in a long-term programme meant to achieve a ‘step-change’ in nature conservation.

By the end of the program, there was not a lot of expectation amongst the individual areas that the NIAs would continue in the same form beyond the three-year mark in 2015. One NIA stated "I guess it felt like everything was under-resourced, and I think by the final year NIAs were then just focussing on, ‘What do we do post-NIA?’...If you
want your conservation to be delivered on a landscape scale you don’t just invest £7m over three years…” (NIA i). The literature on conservation challenges supports this statement; Guerrero et al (2013) state that “many of the challenges conservation professionals face can be framed as scale mismatches. The problem of scale mismatch occurs when the planning for and implementation of conservation actions is at a scale that does not reflect the scale of the conservation problem,” (p 35). One of the major challenges they recognise is the conflict between the short-term approach of planners or politics and the longer-term approach necessary to achieve ecological and social changes (Folke et al, 1998) as sought by the NIA Initiative. Guerrero et al (2013) emphasise that a lack of suitable funding as well as focus on projects which are shorter in duration has impacted the effectiveness of conservation interventions. Furthermore, there is, among other challenges, the overlooking of the vast array of value systems in communities (Wondolleck and Yafee, 2000; Van Houtan, 2006) which inhibits progress towards engaging wider society in the conservation process and achieving the wide partnership of people sought by the NIA Initiative, particularly over short timescales.

In essence, the NIA Initiative ended in 2015; even in the report detailing the next stage of nature conservation in the UK, A Green Future; Our 25-Year Plan to Improve the Environment (Defra, 2018b), NIAs are only mentioned once. The Report stated “We can learn from previous initiatives that have delivered landscape-scale change. Examples include Nature Improvement Areas; areas of up to 50,000 hectares which brought local groups together to improve both rural and urban environments, creating new habitat for wildlife to thrive and ensuring people will enjoy them for generations to come.” (Defra, 2018b, p 60). However, whether the Initiative has truly inspired the lessons needed for a step-change in nature conservation is debateable.

5.2 Objectives and targets of the NIAs

This section examines the objectives and targets of the individual NIAs, particularly exploring the impact of the management context. Furthermore, this section specifically addresses the biodiversity conservation, ecosystem service delivery and community engagement priorities of the objectives along with potential synergies and trade-offs. It relies on primary data from the interviews, document analysis of the 12 second-stage business plans as well as secondary data from the Collingwood reports (CEP, 2013; CEP, 2014a; CEP, 2015a). It relates the analysis back to the main policy
drivers for the NIAs and considers the objectives of the individual NIAs in light of the recommended activities as presented in the NIA Guidance Notes (NIA 1) and discussed in Section 4.4.

Section 5.2 is specifically examining whether the NIA Initiative met its own needs in terms of national objectives 6 and 7, respectively:

- “‘Win-win’ opportunities are identified and have the potential to be exploited to the full to derive multiple benefits, for example with benefits for the water environment and Water Framework Directive objectives, flood and coastal erosion risk management and the low-carbon economy,” (NIA 1, p5); and,
- “There are opportunities to inspire people through an enhanced experience of the outside world,” (NIA 1, p 5).

The NIAs each presented approximately five objectives and several associated targets in their second-stage business plans which essentially form a plan of action for the individual NIA, requiring “costed and geographically explicit proposals” (NIA 1, p 11) for which “monitoring and evaluation mechanisms” (NIA 1, p 12) were already to be in place. The Business Plan was more than a vision, it was “particular ecological, social and economic benefits which [the] NIA is expected to deliver, with a series of specified milestones and measurable activities,” (NIA 1, p 19). The development and framing of the objectives and targets presented in the Business Plans are discussed first in Section 5.2.1 This is followed by an exploration of the aim of the objectives in Section 5.2.2 in light of the recommended actions described in Section 4.4 as well as the dual mandate for both biodiversity conservation and ecosystem service delivery described by the overall NIA policy directives discussed in Section 4.1. Finally, the segment concludes with an examination of whether or not the NIA Initiative, in its endorsement of these objectives of the individual NIAs, meets its own national objectives.

5.2.1 NIA objectives and targets: what were they aiming to do?

Having established that the strategic vision was generally driven by the lead organisations or existing partnerships in Section 4.2, this section aims to explore the development of the specific objectives and targets of the individual NIAs. This was done using document analysis to examine the data and strategies from which the NIA Business Plans were created.
Five NIAs developed their management strategies from existing partnership strategies underpinned by data from a variety of sources including the partners. These NIAs included all four NIAs from Management Group 1 and one NIA from Management Group 2. This NIA, however, was Northern Devon which does include a Biosphere Reserve. Biosphere Reserves are required to ensure that, as part of the criteria for designation, provisions be made for both a management policy or plan for the area and an authority or mechanism be designated to implement this policy or plan (Article 4 of the Statutory Framework of the World Network of Biosphere Reserves).

Three NIAs from Management Group 2 based their NIA business plans on existing work; two used Wetland Vision projects to inform their bids while the third relied heavily on existing research by John Rodwell (Rodwell et al, 2005). The remaining four NIAs from Management Group 3 used available national, regional and local data, including some sourced from partners, but they did not have existing, landscape-scale management strategies. Table 5.1 details the individual NIAs' data resources and provides a description of how they developed their business plans.
### Table 5.1 Data sources and business plan development of the individual NIAs by management context group.

<table>
<thead>
<tr>
<th>Mgmt Group</th>
<th>NIA</th>
<th>Data source</th>
<th>Development of business plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP</td>
<td>Existing partnership strategies underpinned by data from variety of sources including partners.</td>
<td>“[The Partnership] can draw on an extensive monitoring and survey baseline, undertaken by both the current NIA partners and others, which has documented the “health” of the proposed NIA. This data, much of which is held centrally by MFTT, has been used to determine the priorities for NIA delivery,” (BP, p 12).</td>
<td></td>
</tr>
<tr>
<td>MB</td>
<td>Existing partnership strategies underpinned by data from variety of sources including partners.</td>
<td>“The NIA Partnership has analysed the national lists of habitats and species of principal importance as defined by S41 of the NERc Act and used an evidence-based approach to prioritise action for the NIA based both on which habitats and species are under threat, where the greatest potential exists to enhance, restore and connect habitats on a large scale and how we know from previous experience that we can make a difference through focussed action and interventions,” (BP, p 23).</td>
<td></td>
</tr>
<tr>
<td>SD</td>
<td>Existing partnership strategies underpinned by data from variety of sources including partners.</td>
<td>“This M&amp;E programme will coordinate and build upon the wide range of relevant monitoring and evaluation work already being carried out by project partners and other stakeholders in the project area, such as the data being collated and analysed for the first South Downs 'State of the Park' report,” (BP, p 43).</td>
<td></td>
</tr>
<tr>
<td>WP</td>
<td>Existing partnership strategies underpinned by data from variety of sources including partners.</td>
<td>“A monitoring group will agree indicators and protocols based on common established standards and agree the baseline for future monitoring. Existing data held at DERC includes the Dorset Biodiversity Audit (bit.ly/dorset-biodiversity-audit), which includes habitat and species data (bit.ly/dorset-habls-species), habitat and monitoring data for many statutory and non-statutory sites, data submitted by volunteers, specialist recording groups and individuals.” (BP, p 43).</td>
<td></td>
</tr>
<tr>
<td>DV</td>
<td>Rodwell J., Ling C., Hey D. 2005. Future landscapes and biodiversity for the Dearne valley Yorkshire. English Nature Commissioned report.</td>
<td>“The project partners have a wide range of high quality and high resolution datasets to enable effective targeting of project resources to secure strategic biodiversity gains. In addition they have knowledge of local opportunities for, and threats to, beneficial land management. Together this information and knowledge will ensure the optimal use of resources in the delivery of outputs and outcomes.” (BP, p 18).</td>
<td></td>
</tr>
<tr>
<td>HL</td>
<td>Wetland Vision.</td>
<td>“The most immediate partnership was Wetland Vision actually. Which, in many ways, led to what the Nature Improvement Area was... It was a very similar partnership, and it helped inform and bring information that helped generate the business plan for the Nature Improvement Area.”</td>
<td></td>
</tr>
<tr>
<td>MM</td>
<td>Wetland Vision.</td>
<td>“This was one of the Wetland Vision areas before it was an NIA... [it] delivered an action plan at the end of the Wetland Vision which kind of became the NIA business plan in a lot of ways.”</td>
<td></td>
</tr>
<tr>
<td>ND</td>
<td>Existing partnership strategies underpinned by data from variety of sources including partners.</td>
<td>“The foundation of the priority areas identified on the vision map is a study undertaken by Professor John Rodwell, Chris Ling and David Hey in 2005. A landscape scale approach was developed based on ecosecne and multifunctional landscape analyses. Multi functional analysis is an holistic approach to supporting the management actions and landscape planning that must underpin the selection and implementation of options. Four ecosecnes were identified; the floodplain, sandstone brow, shale valley and limestone scarp.” (BP, p 9).</td>
<td></td>
</tr>
<tr>
<td>BBC</td>
<td>Available national, regional and local data including partners.</td>
<td>Two Living Landscape projects, with the LBAP, provide a coherent landscape-scale vision and context for an NIA covering the whole of Birmingham and the Black Country supported by area-wide ecological datasets and frameworks. (BP, p 13).</td>
<td></td>
</tr>
<tr>
<td>GTM</td>
<td>Available national, regional and local data including partners.</td>
<td>“The real answer is when you work in a partnership like this everyone has to have a bit of the cake... So we looked at a series of different projects which we thought were important.”</td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>Available national, regional and local data including partners.</td>
<td>“So they wrote the business plan based on what they were going to do. They were going to build 10 new dew ponds. They were going to have bird villages, and all sorts of things.”</td>
<td></td>
</tr>
<tr>
<td>NV</td>
<td>Available national, regional and local data including partners.</td>
<td>“The bid is underpinned by a sound evidence base, drawing on national, regional and local understanding of the pressures facing the NIA and approaches to tackling them. This knowledge is supported by the close alignment of the bid with local academic institutions providing a scientific grounding in delivery and ensuring that success on the ground is carefully monitored, evaluated and the findings disseminated.” (BP, p 1).</td>
<td></td>
</tr>
</tbody>
</table>

Source: NIA Business Plans and semi-structured interviews (Table 3.2).
Each NIA’s business plan has been analysed in order to assess the framing of their objectives, namely how they prioritise biodiversity conservation and/or ecosystem service delivery. The results of this analysis are presented in Table 5.2. In order to explain this analysis, the steps are discussed in turn which ultimately results in how the framing of a particular NIA’s objectives was determined. The results of this analysis, compiled and presented in Table 5.2, were conducted by the author for this work using document analysis and data derived from the 12, individual NIA Business Plans, the conclusions of which were triangulated with data derived from a Natural England Report (van Dijk et al, 2013).
Table 5.2 Table of individual NIA’s framing of objectives.

<table>
<thead>
<tr>
<th>NIA</th>
<th>Lead partner</th>
<th>Biodiversity objectives</th>
<th>Ecosystem Service objectives</th>
<th>Ecosystem Service Approach</th>
<th>Overall Framing - This analysis</th>
<th>Overall Emphasis - NERC analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Peak</td>
<td>RSPB</td>
<td>Priority habitat, priority species, connectivity</td>
<td>Water quality, flooding, carbon storage, recreation</td>
<td>Identifies priority ecosystem services, which inform a number of projects but no activities specifically framed around ecosystem services.</td>
<td>Biodiversity - emphasis on improving space for nature with added benefit of improved ecosystem service delivery.</td>
<td>“Plan aims to deliver its objectives through habitat creation, restoration and connection and targeted advice to landowners,” (p.12).</td>
</tr>
<tr>
<td>Morecambe Bay</td>
<td>AONB</td>
<td>Priority habitat, connectivity, buffer zones</td>
<td>Water quality, carbon storage, recreation</td>
<td>Indicates priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The plan is to very community driven, focusing on getting local people and businesses involved in habitat connectivity. The plan aims to improve biodiversity and deliver social benefits through well functioning habitat networks.” (p.13).</td>
</tr>
<tr>
<td>South Downs</td>
<td>National Trust</td>
<td>Priority habitat, connectivity</td>
<td>Water quality, recreation</td>
<td>Identifies priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The plan focuses on connecting the South Downs to these communities and improving ecological networks along a linear strip. The plan has ecosystem services (particular scenario) at its core.” (p.14).</td>
</tr>
<tr>
<td>Wild Purbeck</td>
<td>AONB</td>
<td>Priority habitat</td>
<td>Agriculture, recreation</td>
<td>Indicates priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The business plan is largely focused on improving biodiversity and realizing socio-economic benefits from the natural environment.” (p.14).</td>
</tr>
<tr>
<td>Downs Valley</td>
<td>RSPB</td>
<td>Priority habitat</td>
<td>Flooding, recreation</td>
<td>Identifies priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“NAA aims to restore the biodiversity of a post-industrial landscape as well as encourage people to re-connect with the local environment.” (p.13).</td>
</tr>
<tr>
<td>Humberford Levels</td>
<td>Wildlife Trust</td>
<td>Priority habitat, connectivity</td>
<td>Agriculture, Flooding, recreation</td>
<td>Indicates priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“Objectives focus on enhancing biodiversity and realising socio-economic benefits from the natural environment, whilst improving resilience to climate change.” (p.13).</td>
</tr>
<tr>
<td>Mere and Mosses</td>
<td>Wildlife Trust</td>
<td>Priority habitat, connectivity, buffer zones</td>
<td>Agriculture, Water quality, flooding, recreation</td>
<td>Indicates priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The plan focuses on halting the decline of biodiversity in the area and addressing diffuse pollution from farming.” (p.13).</td>
</tr>
<tr>
<td>Northern Devon</td>
<td>Wildlife Trust</td>
<td>Priority habitat</td>
<td>Agriculture, Water quality, flooding, recreation</td>
<td>Indicates priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The focus of the plan is water (quantity and quality) as well as associated habitats and species.” (p.14).</td>
</tr>
<tr>
<td>Birmingham and the Black Country</td>
<td>Wildlife Trust</td>
<td>Priority habitat, priority species, connectivity</td>
<td>Recreation</td>
<td>Indicates priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The focus of the business plan is on the socio-economic benefits that can be realised from improving biodiversity and ecosystem services” (p.12).</td>
</tr>
<tr>
<td>Greater Thames Estuaries</td>
<td>Thames Estuary Partnership Ltd</td>
<td>Priority habitat, priority species</td>
<td>Agriculture, Recreation</td>
<td>Identifies priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“A landscape facing pressures from development, urban regeneration and climate change. The focus of the plan appears to be reducing the vulnerability of the area to these multiple pressures. The objectives of the plan follow the recommendations of the Lawton review, i.e., making habitats bigger, better and more interlinked.” (p.15).</td>
</tr>
<tr>
<td>Marlborough Downs</td>
<td>Marlborough Down NIA Ltd</td>
<td>Priority habitat, priority species</td>
<td>Recreation</td>
<td>Identifies priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The focus of the plan is to connect and buffer Existing habitats (e.g., dew ponds) and involve local people within the landscape.” (p.13).</td>
</tr>
<tr>
<td>Nene Valley</td>
<td>Regional Park</td>
<td>Priority habitat</td>
<td>Agriculture, Water quality, flooding, recreation</td>
<td>Identifies priority ecosystem services and their activities around them.</td>
<td>Sustainable use of natural resources.</td>
<td>“The plan is heavily focused on planning policy and maximizing the benefits of ecosystem services.” (p.14).</td>
</tr>
</tbody>
</table>

Source: Results of analysis compiled in this table developed by the author with data from individual business plans (Table 3.2) and van Dijk et al (2013).

Table 5.2 provides data on all 12, individual NIAs including their lead partner, broad biodiversity and ecosystem service objectives, their ecosystem services approach, the overall framing of their objectives, and corroboration of the conclusions of the framing analysis based on data from a Natural England report (van Dijk et al, 2013). Each NIA provided approximately five objectives, which were then assessed for their biodiversity conservation (for example, priority habitat) and / or ecosystem service
delivery (for example, water quality) priorities. The ecosystem services approach was then considered. There are three categories developed and applied by the author when discussing their ecosystem service approach in the NIA business plans: identifies, indicates and implies.

- **Identifies** means that the NIA has a specified target and plan to achieve delivery of a certain service or services; Dark Peak provides an example with their first objective, “The NIA will restore and enhance the hydrological functionality, resilience to climate change, botanical diversity, breeding wader populations, carbon stewardship and water quality, across 5,800 hectares of blanket bog, including 5 peatland plateaus, by 2020.” (Dark Peak NIA Business Plan, p 17). The objective provides clear examples of biodiversity and ecosystem service targets associated with a specific objective. Also of note is that the strategy continues on past the end-date of the NIA program, providing an example of the longer-term approach of some NIAs.

- **Indicates** means that at least one service is mentioned in a broad way but there is no more detail supplied with regard to the delivery of that particular outcome; Humberhead Levels provides an example with their second objective, “Achieve sustainable water management in an arable landscape through enhancement of riparian habitats along connecting rivers and drains” (Humberhead Levels NIA Business Plan, p 18). There are clear biodiversity goals, the enhancement of riparian habitats, and a mention of 'sustainable water management' but no further details in the objective with regard to specific ecosystem service targets.

- **Implies** means that a service is not specifically addressed but the target is associated with the potential delivery of a specific ecosystem service; Meres and Mosses provides an example with their third objective, “Reduce diffuse pollution through working on nutrient management with farmers.” (Meres and Mosses NIA Business Plan, p 1). Reducing diffuse pollution improves water quality which has clear biodiversity and ecosystem service benefits, but neither are specifically addressed by the objective.

The overall framing of the objectives was then determined by the author. This assessed the emphasis of the objectives. Two framing themes have been identified.

- **Biodiversity conservation** – Emphasis is on improving space for nature with added benefit of improved ecosystem service delivery; and
**Sustainable use of natural resources** – Emphasis is on realising social and economic benefits which are achieved through the creation and restoration of natural ecosystems.

Finally, this analysis was compared to a similar analysis conducted by Natural England as part of a report which was examining climate change adaptation in the NIAs (van Dijk et al, 2013). The results are then discussed in the context of the Lead Bodies, which drove the framing of the NIA strategies, as discussed in Section 4.2.

What emerges from this analysis is that, while all 12 of the NIAs have clear conservation objectives and targets, ecosystem service delivery is inconsistently presented as a priority objective when examining the twelve, individual NIAs despite being a priority objective at the national level (see Section 4.1). Only four NIAs clearly identify a specific ecosystem service as a priority in their objectives. Dearne Valley, an NIA led by the RSPB, does not in fact mention the phrase ‘ecosystem service’ anywhere in their business plan; however, the NIA does clearly emphasise the creation and restoration of floodplain habitat to help mitigate flooding, so the intention could be considered to be obvious despite the omission. Six NIAs indicate a consideration of at least one ecosystem service. The remaining two imply ecosystem service benefits in their objectives but the delivery of the services is clearly not a priority as they are not stated outright. Of the eight NIAs that did not specifically identify ecosystem service objectives, seven clarify their priorities in their targets; the eighth was still quite vague about their priorities.

Ultimately, five of the NIAs frame their approach so that improved space for wild nature is the primary objective for their activities with the added benefit of improving ecosystem service delivery, supposedly win-win scenarios although only two of the five NIAs use the term ‘win-win’. In the other seven NIAs, however, their objectives are framed so as to suggest that their approach is focused on socio-economic benefits that result from the improvement of ecological systems and with significant consideration for benefits for people as well as wild nature. Two NIAs are discussed in detail here to provide examples of these two approaches.

Dark Peak provides an example of an NIA focused on the creation and restoration of space for wild nature which has the added benefit of improving delivery of ecosystem services as well. Dark Peak is an NIA which overlaps heavily with a national park, although the NIA itself is led by the RSPB. Most of its land use is classified as priority habitat. Dark Peak has five objectives, all of which have some wild nature conservation focus and three of which are solely focused on wild nature conservation.
Their first objective, one demonstrating a synergistic approach, to “restore and enhance the hydrological functionality” (DP BP, p 17) of 5800 hectares of blanket bog which will provide, in addition to increased botanical diversity and benefits for breeding wader populations, improvements in water quality and carbon storage. Clearly, however, the focus is the restoration of a priority habitat and improvements for priority species.

In contrast, Morecambe Bay, an NIA which overlaps heavily with, and is in fact led by, an AONB, frames the objectives with emphasis on benefits for people. Morecambe Bay also has five objectives but only one of the objectives is predominantly focused on wild nature conservation; “Within sustainable land management systems, buffer, connect and create ‘stepping stones’ between high quality sites to allow development of a coherent ecological network that is resilient to climate change” (MB BP, p 21). Even that has elements of benefits for people with its emphasis on spaces for nature in ‘sustainable land management systems’. Two other objectives contain elements of biodiversity conservation but are largely focused on ecosystem service provision. The last two seek to “promote the growth of a sustainable low carbon economy” (MB BP, p 21) and improve “integration with the planning system” to achieve “sustainable development” (MB BP, p 18). Essentially, the objectives are most focused on benefits for people.

As previously mentioned, the lead bodies provide some insight into the framing of the objectives and targets in the NIAs. The five NIAs that emphasise biodiversity conservation in their management strategies include the two NIAs led by the RSPB, one by a Wildlife Trust, one by an NGO and one by a charitable organisation set up specifically for the NIA. The RSPB and charitable organisation are both focused on biodiversity while the Wildlife Trust embodies a dual mandate with consideration for both wild nature and ecosystem service delivery. The seven NIAs that emphasis ecosystem service delivery and benefits for people in their management strategies include three run by a landscape designation management body (two AONBs and one NP), three run by a Wildlife Trust and one by a Regional Park, all bodies with a dual focus. Regardless of the framing, however, there is far more clarity with regard to wild nature objectives and targets than with regard to ecosystem service objectives and targets. This was noted in conversations with national bodies as well; it was suggested that as the ecosystem services approach was relatively new, some organisations justified their approach on the basis of biodiversity acting as a primary focus with ecosystem services as a secondary focus. While this is not necessarily consistent between different NIAs, it is the overall trend within the NIA Initiative.
Furthermore, only four NIAs actually specifically identify potential win-win scenarios. This emphasis on biodiversity conservation is evidenced further by the breakdown of objectives into biodiversity and ecosystem service categories (including cultural services which addresses community engagement), which is explored in the following section.

5.2.2 The objectives of the individual NIAs and the multiple mandates: what were their goals for biodiversity conservation, ecosystem service delivery and community engagement?

This section specifically explores breakdown by category of the objectives and targets of the individual NIAs, particularly in light of the multiple mandates. Not all objectives necessarily related to only one aspect of the multiple-objective mandate; one objective might encompass both biodiversity conservation and ecosystem service delivery targets. The objectives, as originally presented in the business plans, were analysed by the author and are discussed here.

The NIA Year 2 Monitoring and Evaluation Report (CEP, 2014a) provided some assessment of the objectives in relation to the dual mandate. According to that assessment, the NIAs had, of the total 60 objectives, 41 objectives which concerned biodiversity, and these were predominantly classified as focused on habitats, species and connectivity (CEP, 2014a). The report states that at least one objective which concerned biodiversity was provided by every NIA. This work agrees with that assessment.

The analyses varied with regard to the ecosystem service objectives, however. The author’s own analysis of the number of biodiversity and ecosystem service delivery objectives found that there were 29 objectives which concerned ecosystem service delivery, five of which focused on provisioning services, 13 relating to cultural services and 11 that relate predominantly to regulating services. None of the objectives concerned supporting services. According to the NIA Year 2 Report (CEP, 2014a), which also considers that 29 of the 60 objectives concern ecosystem service delivery, four relate to provisioning services, 12 to cultural services and 13 to regulating services. Furthermore, also according to the NIA Year 2 Report (CEP, 2014a), only eight NIAs have objectives which concern ecosystem service delivery. This work, however, found that all 12 NIAs had at least one objective which concerned ecosystem service delivery. It is possible that a different approach is used for the two
assessments; the NIA Year 2 Report (CEP, 2014a) does not provide any explanation for how the results were determined. Please see Figure 5.3 for the graphical demonstration of this analysis. Of note is that the regulating and provisioning ecosystem services included within the objectives of the NIA are almost exclusively those cited as potential examples of win-win scenarios in the original Lawton Report (Lawton et al, 2010) and then provided under the Recommended Activities section in the NIA Guidance Notes (NIA 1).

Figure 5.3 Comparison of NIA biodiversity (BD) objectives and ecosystem service (ES) objectives by category from two analyses, including one from the Year 2 NIA Monitoring and Evaluation Report (CEP, 2014a) and author's own.

Source: Figure: Author's own analysis of NIA objectives as compared to that of CEP (2014a); data sourced from the 12 NIA Business Plans which state the individual objectives and the Year 2 Monitoring and Evaluation Report (CEP, 2014a).

The NIA Monitoring and Final Evaluation Report (CEP, 2015a) provided a third examination of the breakdown of the NIA objectives under different categories at the end of the NIA Initiative. Please see Figure 5.4 which shows this assessment.
It is not a particularly useful assessment and in fact, could be considered misleading as the categorisation is different to the previous assessment in the Year 2 NIA Monitoring and Evaluation Report (CEP, 2014a) thus altering the representation of certain types of objectives. For example, water management is separate from the general ecosystem services category. Despite the poor quality, Figure 5.4 still reveals the emphasis on biodiversity conservation objectives over ecosystem service delivery objectives in the individual NIAs. Not only are biodiversity objectives more numerous than the ecosystem service objectives (the number of objectives in the three conservation categories of “Habitat management, enhancement and restoration”, “Creating better connected habitats” and “Managing wildlife sites and species” all are greater than or equal to the ecosystem service categories of “Water management” and “Ecosystem services” except for the blended category of “Community involvement and enhancing access”, but biodiversity conservation has the largest number of objectives when summed), but the biodiversity-focused objectives are also clearer. The ecosystem service objectives are divided into unhelpful categories; for example, there are both individual service categories such as “Water management” but also a general “Ecosystem services” category and no explanation of the breakdown.

However, the analysis also blends ecosystem service delivery objectives with community engagement objectives, namely through the “Community involvement and enhancing access” category; community involvement falls under the Social &
Economic heading of indicators while Access sites under the Ecosystem Services heading (Table 5.3). Furthermore, the “Community involvement and enhancing access” category essentially aligns community engagement to improving access which is only one aspect of community engagement; this framing is discussed in further detail in Section 5.3. Nonetheless, the trend is clear; there are more biodiversity conservation-focused objectives than ecosystem service delivery objectives. Part of this problem likely stems from the fact that the criteria for selecting the NIAs did not include clear or specific explanation of social and economic well-being benefits, and therefore neither the objectives nor the broader Business Plans of the individual NIAs focused on the category (CEP, 2015e). This in turn illustrates the disconnect between national and local objectives; this challenge was further enhanced by the lack of clarity in the beginning with regard to specific and measurable social and economic objectives at the national level (CEP, 2015e). When the community engagement objectives are explored further, it becomes evident that most objectives focus on access (see for example NV BPNE, 2014; BBC BPNE, 2014 in NIA 3 listed in Table 3.2) or targeting specific community groups as opposed to wider community engagement.

What emerges when exploring this analysis with regard to Management Category is that, while there are differences between the management plans and resources available to NIAs in Management Categories 1 and 2, there was no discernible pattern with regard to biodiversity conservation, ecosystem service delivery or community engagement objectives in the management plans. Essentially, the ecosystem service delivery was confused and inconsistent across all Management Categories, suggesting that the challenge with ecosystem service delivery goes beyond the management or biophysical contexts of the NIAs.

5.3 Monitoring and the NIAs

This section examines the monitoring system of the NIAs. This system was intended to allow the NIAs to discuss their progress towards achieving the local, national and international commitments and / or objectives of the Initiative (CEP, 2013). The framework was developed as a result of a consultation between the NIA steering group members and government agency experts accountable for the development as well as the upkeep of environmental data sets used by the Initiative (Nature Improvement Area Monitoring and Evaluation Framework, 2012). It was intended to
be simple and cost-effective with regard to implementation so that it was not arduous to implement for the individual NIAs. Thus, it was designed to make use of available information by drawing on data sets and monitoring programs already in place, particularly at the local level but also at the national level. An online reporting tool (NIA 4) was developed for the NIA Initiative to provide somewhere for the NIAs to record, store, report and share their data and information on activities; this tool was “intended to complement rather than duplicate other systems of data recording” (CEP, 2013, p 11) such as the Biodiversity Action Reporting System or BARS. Furthermore, it was intended to be flexible to use, thus allowing for the evaluation of different objectives and approaches adopted by individual NIAs at a local level but also provide results that could be summarised across the twelve NIAs at a national level. In essence, it was a very ambitious program, particularly as ecosystem service work was at a comparatively early stage when compared to biodiversity work. The eventual monitoring system, designed specifically for the NIA Initiative and originally presented in July 2012, proved challenging for the individual areas to implement effectively and was altered after the first year when NIAs reported problems; the updated system (CEP, 2014c), the predominant focus of this work, was not introduced until March 2014. It is not clear what happened to the data collected in the first year before the monitoring system was updated.

The data used in this section is a mixture of primary and secondary data sourced both from the NIA Guidance Notes (NIA 1) and Criteria (NIA 2), the monitoring system data (CEP, 2014c) the Collingwood Reports (CEP, 2013; CEP, 2014a; CEP, 2015a) and the semi-structured interviews conducted with managers form each of the NIAs. This section is divided into two parts; the first explores the framing of the monitoring system, its four categories and the indicators ultimately used in the system, particularly given the dual mandate of the Initiative. The second section explores the actual implementation of the monitoring system in the individual NIAs and their experience with the system. It ends with an exploration of the eventual results in terms of what indicators were ultimately reported on over the three years, again with reference to the dual mandate for both biodiversity conservation and ecosystem service delivery.

Section 5.3 is specifically examining whether the NIA Initiative met its own needs in terms of national objectives 6 and 7, respectively:

- “Win-win’ opportunities are identified and have the potential to be exploited to the full to derive multiple benefits, for example with benefits for the water environment and Water Framework Directive objectives,
flood and coastal erosion risk management and the low-carbon economy,” (NIA 1, p5); and,
- “There are opportunities to inspire people through an enhanced experience of the outside world,” (NIA 1, p 5).

5.3.1 Framing of the monitoring system

The monitoring system of the NIAs is divided into four themes:

- **Biodiversity**: this includes habitat diversity, species diversity, connectivity and invasive species.
- **Ecosystem services**: this is further divided into four categories; cultural services, supporting services, regulating services and provisioning services
- **Social and economic benefits and contributions to well-being**: this is divided into social impacts, well-being and economic values and impacts
- **Partnership working**: this is categorised as the deployment of resources, efficient and effective delivery of objectives as well as leadership and influence.

Protocols and indicators were developed for each sub-theme. Some indicators were local indicators; these were non-specific in protocol in order to allow for innovation associated with topics such as habitat connectivity, ecosystem services and social and economic benefits. Table 5.3 shows the final framework of the NIA indicators categorised by theme and with the Status of indicator (whether it is core, optional or local).
Table 5.3 Table of sub-set of indicators of NIA monitoring system, adapted from CEP (2015a).

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Indicator</th>
<th>Indicator title</th>
<th>Status of Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>Habitat</td>
<td>B01_H</td>
<td>Extent of existing priority habitat managed to maintain / improve its condition</td>
<td>Core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B02_H</td>
<td>Extent of areas managed to restore / create habitat</td>
<td>Core</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B03_H</td>
<td>Proportion of SSIs in favourable or recovering condition</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B04_H</td>
<td>Total extent of priority habitat</td>
<td>Core</td>
</tr>
<tr>
<td></td>
<td>Species</td>
<td>B05_S</td>
<td>Extent of habitat managed to secure species-specific needs</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B06_S</td>
<td>Status of widespread species</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B07_S</td>
<td>Status of focal species</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Invasive species</td>
<td>B08_S</td>
<td>Control of invasive non-native species</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Habitat connectivity</td>
<td>B09_C</td>
<td>Optional indicator of habitat connectivity</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B10_C</td>
<td>Comparative indicator of habitat connectivity</td>
<td>Core</td>
</tr>
<tr>
<td>Cultural</td>
<td></td>
<td>ES01_C</td>
<td>Measure of extent of land managed to enhance landscape character</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES02_C</td>
<td>Length of accessible PROW and permissive paths created and / or improved</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES03_C</td>
<td>Condition of historic environment features</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Supporting</td>
<td>ES04_C</td>
<td>Access to natural greenspaces and / or woodland</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Regulating</td>
<td>ES05_S</td>
<td>Area of habitat supporting pollinators</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Provisioning</td>
<td>ES06_R</td>
<td>Contribution to water quality</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES07_R</td>
<td>Contribution to carbon storage &amp; sequestration</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Economic values &amp; impacts</td>
<td>ES08_P</td>
<td>Area of more sustainable agricultural production</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Social impacts &amp;</td>
<td>ES09_P</td>
<td>Percentage of woodland in active management</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>well-being</td>
<td>ES01_S</td>
<td>Attitudes of local community to the natural environment and environmental behaviours</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES02_S</td>
<td>Number of educational visits</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ES03_S</td>
<td>Number and social mix of visitors to NIA sites</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Social and Economic</td>
<td>ES04_S</td>
<td>Number and social mix of people involved in NIA activities and events</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Biodiversity</td>
<td>ES05_S</td>
<td>Level of outdoor recreation by NIA residents</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Ecosystem Services</td>
<td>ES06_S</td>
<td>Number of volunteer hours on NIA activities</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Social and Economic</td>
<td>ES07_E</td>
<td>Estimated value of visitor expenditure to local economy</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>PW1_R</td>
<td>PW01_R</td>
<td>Project income and expenditure</td>
<td>Core</td>
</tr>
<tr>
<td>Economic values &amp; impacts</td>
<td>PW2_R</td>
<td>PW02_R</td>
<td>Financial value of help-in-kind</td>
<td>Core</td>
</tr>
<tr>
<td></td>
<td>PW4_E</td>
<td>PW04_E</td>
<td>Fulfilment of identified skills needs</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>PW5_E</td>
<td>PW05_E</td>
<td>Attitudes of local community to NIA</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>PW6_E</td>
<td>PW06_E</td>
<td>Assessment of partnership working</td>
<td>Optional</td>
</tr>
<tr>
<td>Partnership working</td>
<td>PW7_L</td>
<td>PW07_L</td>
<td>Audience reach</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>PW8_L</td>
<td>PW08_L</td>
<td>Level of awareness of NIA in local community</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>PW9_L</td>
<td>PW09_L</td>
<td>Number of enquiries</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Source: Adapted from Final Monitoring and Evaluation Report (2015a). The * refers to an indicator listed as optional but the description of which indicates it is local in focus and not scalable.

This work is mainly interested in the implementation of the biodiversity and ecosystem service indicators and protocols as it explores the dual mandate. However, this is complicated by the framing of the ecosystem services indicators, both within ecosystem service sub-themes but also as a result of the overlap between the ecosystem services theme and the social and economic theme, particularly with regard to cultural services. The UK NEAFO describes the four key elements of cultural ecosystem services (Church et al, 2014), which are also employed by the UK NEA (2011) and the NIA Initiative (CEP, 2014b); these components are environmental spaces; cultural values; cultural practices; and benefits. The cultural ecosystem service indicators used in the NIA Initiative largely explore access, which is only one component of cultural ecosystem services, namely environmental spaces; the other three categories, cultural values, cultural practices and benefits, are largely missed. The indicators under the Social heading of the NIA monitoring system deal with the
other three components of cultural ecosystem services, albeit incompletely. This next section explores the framing of the ecosystem service theme in the NIA Initiative, particularly in the monitoring system, and its relationship to the biodiversity theme, examining the categorisation of the services and the challenges associated with such an approach when developing an ecosystem management method and indicators for a monitoring system.

To understand the complexities and challenges associated with the framing of the categories and sub-themes in the monitoring and evaluation framework of the NIA Initiative, it is first necessary to briefly explore the relationship between biodiversity and ecosystem services, which was discussed in detail in Section 2.1. Biodiversity has key functions across all aspects of the ecosystem service framework, from the ecological processes that underpin all services to the final services and goods which provide direct benefits to people. However, biodiversity is not treated consistently in ecosystem assessments (Mace et al., 2012). At one end, there is an implication that managing for one aspect, biodiversity conservation or ecosystem service delivery, will also provide suitable management for the improvement of the other. At the other extreme, biodiversity itself is treated as a service, thus the expectation is that effective ecosystem management will provide for the maintenance of wild nature, particularly those species of conservation focus. Neither extreme is consistent with ecosystem science. The treatment of biodiversity as a service, termed by Mace et al. (2012) to be the ‘conservation perspective’ (p 20), is the approach that the NIA Initiative takes at the national level.

One major issue with the conservation perspective is that it often focuses on a subset of charismatic species when examining biodiversity. This is quite true of the NIA Initiative; it encompasses nine biodiversity indicators across the four sub-themes of habitat, species, connectivity and invasive species. Seven of the indicators examine habitat and species biodiversity. Of those seven, three are species indicators, all of which invite focus on certain groups of charismatic species, though each indicator employs a slightly different term: habitat for “species-specific needs”, “wide-spread species” and “focal species” (CEP, 2013, p 7). In developing monitoring systems with such indicators, charismatic, often monitored species with readily available data are inevitably chosen, particularly given the tight timescale of the NIA Initiative. The emphasis on priority habitats and charismatic species ultimately results in a narrow scope of biodiversity indicators for a complex concept. Another major issue with the conservation perspective is that ecosystem services are often measured without regard for the role that biodiversity plays in underpinning ecosystem processes.
These roles and/or interactions, which include all aspects of biodiversity, regulate the amounts, quality and consistency of service delivery.

Some assessments use the four categories of ecosystem services (cultural, regulating, supporting and provisioning) to separate the underpinning ecological processes, final services and goods. The four categories of services described by the NIA framework are widely used, including in both the Millennium Ecosystem Assessment (2005) and the UK National Ecosystem Assessment (2011), which based its framework on the MA (2005) although the UK NEA makes a distinction between intermediate services/processes and final ecosystem services where the MA does not. The use of the categories, particularly with regard to separating the various types of services and goods, has been debated as there are overlaps and interdependencies between the four categories, particularly with regard to the underpinning role of support services (Mace et al, 2012). However, in the UK NEA (2011), provisioning and cultural services are always considered to be final ecosystem services while regulating services might be classed as either final services or intermediate services/processes and supporting services are always considered to be intermediate services/processes (UK NEA, 2011). Upon examining the NIA Initiative, the services considered as part of the monitoring system are landscape character, accessibility, historic environment features, pollinators, water quality, carbon storage and sequestration, sustainable agricultural production, and woodland in active management. Employing the UK NEA approach, of the eight non-local NIA indicators for ecosystem services, seven focus on final ecosystem services, including the regulating services. Only one, the indicator examining pollinators, could be considered to focus on an underpinning process. Thus, the NIA Initiative monitoring system seems to have a bias whereby it overlooks the underlying ecological processes that drive ecosystem service delivery, instead emphasising the delivery of final ecosystem services. This bias is presented as a note on the NIA Initiative, but it is a common challenge in conservation programs and thus the NIA Initiative cannot be unduly criticised for it.

Another problem with the NIA system is that there is overlap between the indicators in different themes. For instance, there are indicators for pollination in both the supporting services and regulating services categories. There is also heavy overlap between the ecosystem service theme and the social and economic theme. Of the eight indicators under the social and economic theme, six could be considered to be indicators of ecosystem service delivery or what the UK NEA (2011) calls benefits. These indicators are predominantly concerned with cultural ecosystem services like
recreation and education. This overlap is in fact mentioned in the Final Monitoring and Evaluation Report (2015a): “There is a direct relationship between ecosystem services and social and economic wellbeing outcomes and impacts…Many of the benefits reported in section 8 could equally be referred to as ecosystem services,” (p 85).

5.3.2 NIA Indicators; how useful are they?

To examine the indicators, it is first necessary to establish the features of a useful, policy-relevant indicator. Indicator criteria can be grouped into two broad elements according to the World Resources Institute (Layke, 2009): data availability and the capacity to convey useful information about the feature in question. However, this analysis looks beyond merely how the system worked to explore what indicators were included, why and how this impacted the Initiative’s ability to achieve its objectives.

Data availability was an important consideration that was purportedly taken into account during indicator development. Data availability was likely a limiting feature when choosing appropriate indicators given the goal of examining both individual NIAs as well as compiling data from all 12 for a national analysis. Ultimately, however, producing quality data proved challenging for the Initiative at both the local and national levels. It was difficult for many of the NIAs to manage the collation of data from various partners with differing levels of experience with monitoring in general or with the indicators employed in the system specifically (CEP, 2013). Due to the challenges associated with local data, the NIA Initiative monitoring was heavily reliant on national data for some indicators. There are some fundamental issues with national data when scaling down to local, in this case NIA, level as recognised by the Year 1 NIA Monitoring Report; data are often patchy, coarse and / or incomplete and thus not able to accurately represent local situations (CEP, 2013).

The intuitiveness or ease of use of the indicators was also an important feature of the monitoring system design, as the indicators needed to be easy to use and understand at a local level by individual NIA stakeholders collecting the data who might potentially have limited experience. The 2013 Year 1 Monitoring and Evaluation Report states that the system was developed “in the context of seeking to minimise the reporting burden on NIAs” (p 37). In practice, however, the NIAs struggled with this, particularly “understanding and interpreting the indicator protocols and associated data requirements” (CEP, 2013, p 37).
Finally, the indicators employed by the NIA Initiative monitoring system are not appropriate for conveying sufficient information to assess change in either the full range of biodiversity nor the limited, specified ecosystem services. The habitat indicators focus entirely on the extent of, often priority, habitat intended to achieve a certain goal, for instance the “extent of habitat managed to improve its condition,” (CEP, 2013, p 7). The species indicators, all optional, examine charismatic or focal species, as discussed before. The last two indicators, one in each sub-theme, deal with connectivity or invasive species; only the connectivity indicator is core.

Six of the eight relevant ecosystem service indicators (that is indicators that are not local by design) in the ecosystem service theme are proxies, predominantly framed in terms of area of habitat potentially contributing to the service instead of an actual measure of the service in question. Essentially, it is assumed that certain habitats provide benefits for the delivery of a service of interest but there is no means to confirm those assumptions. The other two remaining indicators examine the condition of historic environment features and access to natural greenspace or woodland as measures of cultural services. Upon delving deeper into the access to natural greenspace indicator, it transpires that data were recorded under a range of different features, including area of accessible greenspace which has similar issues to the other ecosystem services discussed above and is, furthermore, not scalable as a result of the different recording methods between NIAs. No NIAs reported on the condition of historic environment features and thus no further information regarding this indicator or protocol is provided in the monitoring reports. Essentially, the indicators were not sensitive to changes over a short, 3-year period nor wholly attainable for the NIA managers.

All these features, both habitat and species biodiversity and habitat which might deliver certain services, are potentially important, but they do not provide indications of the full range of biodiversity nor its role in providing benefits in the form of ecosystem services for humans. Furthermore, there is an assumption that improvements in certain habitats will provide benefits for humans by improving the delivery of ecosystem services. However, delivering improvements in habitat creation and restoration does not guarantee improvements in service delivery. Also, although plans may be developed to maximize any one of these at a particular time and place through the creation and restoration of habitat, it is now accepted that diversity on its own is not sufficient and that the amount and distribution of certain components of biodiversity, beyond charismatic species, in time and space are additional dimensions that cannot be ignored (Mace et al, 2012). One scalable indicator which addresses
connectivity is not enough to account for the components of time and space. A wider range of indicators would be necessary to move beyond basic compositional biodiversity to data which addresses ecosystem functions, ecosystem services and the broader benefits to society.

Of the six social indicators which could be considered ecosystem service indicators, two varied in methodology between individual NIAs and thus were not scalable or suitable for assessment at a national scale. These were the “Attitudes of the local community to the natural environment and environmental behaviours” and “Level of outdoor recreation by NIA residents”. The other four indicators were scalable but were narrow in scope; three focused on the number and social mix of visitors to the NIA sites for general and educational purposes or NIA events while the last was concerned with the number of volunteer hours logged on NIA activities. Ultimately, these indicators do not provide a comprehensive understanding of the services which they seek to assess, namely the contribution of the NIA to the physical, mental and spiritual well-being of those who work, live and visit the area, although they might still provide valuable information on certain aspects of community engagement.

The problems with the monitoring system are likely largely a result of the rushed and complex, multifaceted design and implementation process of the monitoring system for the NIA Initiative. In conversations with those involved in the creation of the system at a national level, it was emphasised that ecosystem service monitoring was at an early stage. It was an ambitious system that was meant to encompass data from 12, diverse NIAs with varied types and degrees of monitoring which would then scale up to the national level, “aggregating data across NIA partnerships,” (CEP, 2015a, p 13). However, there were also fundamental issues with the framing of the system which were amplified at the local level.

5.3.3 Applying the system; what indicators were reported on?

The NIAs were required to report on four biodiversity indicators including two habitat indicators, one species and one connectivity; the indicator for invasive species was optional as illustrated in Table 5.3. Similarly, the NIAs were required to report on three ecosystem service indicators, one cultural, one regulating, and one provisional service; supporting service indicators were optional. When examining the counts of indicators reported for each category of biodiversity and ecosystem services, far more indicators were reported for biodiversity in all three years. When the Social theme is
taken into account as addressing certain ecosystem services, though, the count numbers are closer, as shown in Figure 5.5.

**Figure 5.5** Number of indicators reported on for each of the three years of the NIA initiative for the Biodiversity, Ecosystem Service and Social themes.

![Graph showing number of indicators reported for each theme across three years.](image)

*Source: Created by the author using data sourced and compiled from the yearly Monitoring and Evaluation Report (CEP, 2013; CEP, 2014a; CEP, 2015a).*

However, when percentages are examined, that is the number of indicators listed in Table 5.3 reported for a category out of the total possible number of indicators that might have been reported had all of the NIAs done so, the Biodiversity theme far outperforms both the Ecosystem service and Social themes, both individually and combined, as shown in Table 5.4.

**Table 5.4** Percentage of indicators reported out of the possible total for the themes of Biodiversity, Ecosystem Services and Social.

<table>
<thead>
<tr>
<th></th>
<th>Percentage of indicators reported out of possible total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year 1</td>
</tr>
<tr>
<td>Biodiversity</td>
<td>38%</td>
</tr>
<tr>
<td>Ecosystem services</td>
<td>27%</td>
</tr>
<tr>
<td>Social</td>
<td>33%</td>
</tr>
<tr>
<td>Combination of ES &amp; S</td>
<td>29%</td>
</tr>
</tbody>
</table>

*Source: Created by the author with data sourced and compiled from the annual NIA Monitoring and Evaluation Report (CEP, 2013; CEP, 2014a; CEP, 2015a).*
The indicators which were actually reported on by the NIAs reveal the same trend as the objectives; despite the dual mandate for both benefits for wild nature as well as people, far more emphasis was placed on improving and expanding the ecological network. This is likely in part due to the inadequacy of the ecosystem service indicators and the change in protocols in the middle of the Initiative; however local motivations also likely played a role. Most significantly, however, it speaks to the fundamental problems with the ability of the Initiative in meeting its own goal of achieving measurable benefits for both people and wild nature.

5.3.4 Monitoring the NIAs: a system that was unlikely to last...

This section brings together the overall thoughts of the NIAs about the monitoring system and specifically addresses the potential longevity of the system. The comments can be broken down into three areas: complexity, timing and longevity.

1 – It was too complex a system: “I think the monitoring and evaluation framework was quite interesting for the first round. It was too complex,” (NIA viii).

The inherent complexity of the system, specifically the evaluation at both local and national scales, amplified existing issues with inadequate data availability which limited the types of indicators that could be included. Thus, many NIAs considered that the system was too ambitious. Most of the NIAs seem to view it as a valiant attempt but did not expect it would continue in the long-term.

2 – There was not enough time to accomplish the desired scope of monitoring: “As usual with these projects, you don’t have the time to do the kind of monitoring that you want to do,” (NIA vii).

The time issues crop up again here, particularly given the complexity of the monitoring system and the re-working of the system midway through the project. One NIA suggested that perhaps, had the system been embedded from the beginning, it might have been more successful.

3 – The monitoring system was felt to be more of a pilot scheme as opposed to a long-term endeavour which limited investment at the local level: “I would look on [the monitoring system] as more of a learning exercise actually,” (NIA viii).

While many of the NIAs felt that there were positive aspects to the monitoring system, ultimately, however, the challenges led some NIAs to perceive the system as a trial
and, as a result, limit their resource investment in the program. “We had a massive monitoring and evaluation programme relating to the NIAs, which frankly really pissed us off. We just thought, ‘Well, it’s not that much money and we’re certainly not going to commit years and years to doing loads of monitoring evaluation of this.’ So, we fought quite hard to scale up. We were going to do what we can do but no more and we’re certainly not going to spend more money on it than we’re spending on the programme,” (NIA x).

This lack of buy-in at the local level was a significant issue for the program as a whole as it was expected that the NIAs would continue predominantly at the local level, that is be ‘self-sufficient’, after three years. It is worth noting that these challenges were noted by NIAs in all Management Groups; even NIAs with established partnerships and experience of monitoring noted problems with the monitoring system. By failing to engage effectively in this sense, the program in many ways restricted its potential long-term effectiveness. This assessment reinforces a point made by other work which emphasises the importance of local perspectives and agency; as Rydin states, the work proposes that “any account of governance needs to have space for the nonfunctionality of central policy tools and for local variation and resistance” (2007, p 620).

5.4 NIAs and England’s existing ecological network

This section examines the NIAs and their potential for buffering core sites as well as their contribution to the connectivity of the existing ecological network at both the national and local levels. Core sites were to be buffered by areas which reduce environmental pressures and better connected through the judicious creation and restoration of new habitats, corridors and core sites. The spatial data sets used for this analysis along with their sources can be found in Table 4.5.

Section 5.4 is specifically examining whether the NIA Initiative met its own needs in terms of national objectives 3 and 4, respectively

- “Significant improvements to the ecological network can be achieved over large areas by enlarging and enhancing existing wildlife sites, improving ecological connectivity and creating new sites;
The surrounding land use can be better integrated with valued landscapes and action to restore wildlife habits and underpinning natural processes, helping to adapt to climate change impacts," (NIA 1, p 5).

It should be noted that while the NIA objectives presented above are provided in their original order, Objective 4 is actually addressed first in Section 5.4.1 while Objective 3 is addressed in 5.4.2.

5.4.1 The buffering potential of the NIAs

A buffer zone is an area that provides a means to reduce the pressures from surrounding areas on designated core sites for wildlife within an ecological network. In order to be an effective buffer zone, the area must be a type of land use which does not contribute significantly to the deterioration of the core spaces. As discussed in Section 4.1, both agricultural and urban / suburban land uses can put pressure on core sites, but both also feature as targets in the objectives and recommended activities of the NIAs (NIA 1). Essentially, having considered the three major types of land use, this section explores the spatial distribution of those land uses.

Methodology

There is no specific guideline for the size of a buffer zone; thus, the most appropriate design is considered to be an area of sufficient size to protect a core site from the specific threats to that site where possible (Carvalheiro et al, 2011). The design of buffer zones is largely specific to the needs of the area focusing on the specific species or threats of concern (Schwartz 1999), however the guiding principle is that any type of buffer zone is an improvement over not having one at all (Diamond 1975). The challenge is with competing land uses as the expansion of surrounding, competing land-uses, such as agricultural / horticultural or built-up areas, can impact the core site; for example, populations of target species can be negatively impacted by habitat loss, poor connectivity of sites for dispersal and edge-effects (Treves, 2009), all of which can be mitigated by suitable buffer zones (Watson et al, 2013; Wegmann et al, 2014). The buffer model has a core space which is enclosed by consecutively larger buffer strips or zones which have increasingly intensive land uses, such as agriculture or urban / suburban land use, a greater distance from the
core (Heinen and Mehta, 2000; Defries et al, 2010), in other words, the spatial distribution of land use. When considering buffer zones in the context of the NIAs, the NIA area itself was considered to be a buffer zone for the core sites of designated areas within it. The 1-kilometre buffer zone surrounding the NIA was comparatively arbitrary and largely used for indicative purposes as the emphasis is on the core sites within the NIAs; thus, the NIAs themselves are considered buffer zones between the core sites and the 1-kilometre area surrounding the NIAs, thus illustrating the nested zones.

To assess the buffering potential of the NIAs, this analysis compared the ratios of three types of land use, priority habitat, agricultural / horticultural and built-up, between core sites within an individual NIA and the larger area of the NIA as well as between the NIA and a 1-kilometre buffer zone around the NIA. This was done using two land use data sets, one based on a 1-kilometre grid and the other based on a 25-metre grid, as well as data on land under Environmental Stewardship Agreements detailed in Table 4.4. See Figure 5.6 for a diagram describing the process.

**Figure 5.6** A diagram of the buffer analysis process.

**Null Hypothesis** – The proportions of the three types of land use in the two areas of comparison are similar.

*Source: Created by author for explanatory purposes.*

The core areas of the NIAs are designated protected areas (PAs), that is areas which have been identified and protected for their ecological significance and thus are largely priority habitat land use. The NIAs, to provide suitable buffering for these core sites, thus should also be largely formed of priority habitat, or potentially agricultural / horticultural land use which would then need to be further assessed to see if it were managed in a wildlife-friendly way. Areas surrounding the NIAs might reasonably have less priority habitat and potentially more agricultural / horticultural or built-up
land uses but areas (NIAs or the 1-kilometre zone around the NIAs) which are overwhelmingly agricultural / horticultural or built-up are less likely to provide suitable buffer zones for the core areas within the NIAs or for the NIAs themselves which in turn buffer the core spaces within them. It is worth noting the land-use differences between the three Management Groups of NIA as illustrated in Figure 4.6 which shows that NIAs in Management Group 1 have more priority habitat and less agricultural and / or urban / suburban space for their areas than NIAs in Management Group 2, which have more priority habitat and less agricultural and / or urban / suburban space than NIAs in Management Group 3. In other words, areas which overlap with a landscape body (Management Group 1) have the greatest percentage of priority habitat for their areas and NIAs with largely informal or newly formed partnerships (Management Group 3) the least. NIAs in Management Group 1 also have a larger percentage of their area also designated as SSSIs, as shown in Table 4.6.

Statistically significant differences between the ratios of the three land uses were assessed by using a Pearson’s chi-square statistical analysis; if the relative proportions of land use within the two spaces (that is a core zone and a buffer zone) are similar (the null hypothesis), the buffer zone would be considered sufficient to provide some protection to the core area. Essentially, land use change outside the protected area might result in areas including key seasonal habitats, areas important for migration routes or habitats containing source populations of some species to be cut off or eliminated entirely (Defries et al, 2010) and thus suitable buffer zones would have ideally have similar ratios of the three competing land uses to be suitable buffer zones, that is larger areas of priority habitat, moderate levels of agricultural / horticultural land use and smaller areas of urban / suburban land use. The Chi-squared test is appropriate for nominal or categorical data as is the data here. The test compares the observed patterns of one set of data to the pattern that would be predicted if the variables were really independent of one other, thus exploring whether an association might exist between the two data sets or variables. The test calculates the Chi-Square statistic and compares it against a critical value from the Chi-Square distribution for the assessment of whether the observed data are significantly different from to predicted pattern. A diagram is shown in Figure 5.7 to assist in visualising the analysis.
Results

None of the analyses for the 12 NIAs and their core areas (that is, the small protected areas within them) provided significant results. The habitat breakdown for the individual NIAs is presented in Table 5.5. Five of the analyses for the 12 NIAs and the 1-kilometre buffer zone (that is, the 1-kilometre wide zone around the NIA) provided significant results; Dearne Valley, Meres and Mosses, Morecambe Bay, Nene Valley and Northern Devon. Thus, those five NIAs have similar proportions of the three land uses within the NIAs and in the 1-kilometre buffer zone outside the NIAs. The detailed results of the Chi-square analyses are presented in Appendix 5. The following criteria were used to classify NIA buffering potential:

- Good buffering potential if priority habitat land use was greater than (>) 66% of the NIA;
- Moderate buffering potential if priority habitat land use was between 33% and 66% of the NIA; and,
- Poor buffering potential if priority habitat land use was less than (<) 33% of the NIA.

Essentially, what these results indicate is mixed buffering potential; the core areas of priority habitat are surrounded by larger proportions of the other two types of land use in many NIAs.
Table 5.5 A table of all 12 NIAs presenting the proportions of each of the three types of land use (priority habitat, agricultural land and built-up land) in the core areas within each NIA, the rest of the NIA and the 1-kilometer zone around the NIA.

<table>
<thead>
<tr>
<th>NIA</th>
<th>Land use</th>
<th>% land use - core areas within NIAs</th>
<th>% land use - NIA</th>
<th>% land use - 1-kilometre zone around NIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birmingham and the Black Country</td>
<td>Priority habitat</td>
<td>62%</td>
<td>5%</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>28%</td>
<td>16%</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>10%</td>
<td>79%</td>
<td>26%</td>
</tr>
<tr>
<td>Dark Peak</td>
<td>Priority habitat</td>
<td>100%</td>
<td>96%</td>
<td>72%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>0%</td>
<td>4%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
</tr>
<tr>
<td>Dearne Valley</td>
<td>Priority habitat</td>
<td>62%</td>
<td>12%</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>31%</td>
<td>57%</td>
<td>68%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>7%</td>
<td>32%</td>
<td>20%</td>
</tr>
<tr>
<td>Greater Thames Marshes</td>
<td>Priority habitat</td>
<td>33%</td>
<td>15%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>65%</td>
<td>73%</td>
<td>43%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>1%</td>
<td>13%</td>
<td>50%</td>
</tr>
<tr>
<td>Humberhead Levels</td>
<td>Priority habitat</td>
<td>88%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>10%</td>
<td>82%</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>1%</td>
<td>5%</td>
<td>14%</td>
</tr>
<tr>
<td>Marlborough Downs</td>
<td>Priority habitat</td>
<td>16%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>84%</td>
<td>94%</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>0%</td>
<td>3%</td>
<td>11%</td>
</tr>
<tr>
<td>Meres and Mosses</td>
<td>Priority habitat</td>
<td>70%</td>
<td>7%</td>
<td>4%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>29%</td>
<td>90%</td>
<td>91%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>1%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Morecambe Bay</td>
<td>Priority habitat</td>
<td>93%</td>
<td>36%</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>6%</td>
<td>57%</td>
<td>54%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>1%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>Nene Valley</td>
<td>Priority habitat</td>
<td>41%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>58%</td>
<td>76%</td>
<td>77%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>1%</td>
<td>18%</td>
<td>16%</td>
</tr>
<tr>
<td>Northern Devon</td>
<td>Priority habitat</td>
<td>91%</td>
<td>16%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>9%</td>
<td>82%</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>0%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>South Downs</td>
<td>Priority habitat</td>
<td>34%</td>
<td>26%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>60%</td>
<td>71%</td>
<td>65%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>6%</td>
<td>4%</td>
<td>21%</td>
</tr>
<tr>
<td>Wild Purbeck</td>
<td>Priority habitat</td>
<td>86%</td>
<td>40%</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Agricultural</td>
<td>13%</td>
<td>55%</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>Built-up</td>
<td>1%</td>
<td>5%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: Created by author from NIA shapefiles and land use data (Table 4.4).

This does not necessarily mean that the NIAs do not provide suitable buffer zones, however as sustainable agricultural practices could limit damage to core areas. To that end, the percentage of agricultural areas under Environmental Stewardship...
(calculated as the area of agricultural land use under an HLS+ELS agreement out of the total area of agricultural land use) was also examined, derived from the dataset listed in Table 4.4. **Table 5.6** shows the percentage of agricultural land under an Environmental Stewardship agreement for each of the NIAs. If an NIA was considered to have poor buffering potential due to a large area of agricultural land use, then it might be improved to moderate buffering potential if more than 50% of the agricultural area were under an Environmental Stewardship agreement. To clarify the approach, a few examples have been chosen to illustrate various scenarios.

**Table 5.6** A table of all 12 NIAs presenting the proportion of agricultural land use which is under an Environmental Stewardship Agreement (HLS+ELS) for both the NIA itself and the 1-kilometre buffer zone (BZ) around the NIA.

<table>
<thead>
<tr>
<th>NIA</th>
<th>Area</th>
<th>Environmental Stewardship Agreement (HLS+ELS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birmingham and the Black Country</td>
<td>NIA 1%</td>
<td>1-km BZ 33%</td>
</tr>
<tr>
<td>Dark Peak</td>
<td>NIA 66%</td>
<td>1-km BZ 23%</td>
</tr>
<tr>
<td>Dearne Valley Green Heart</td>
<td>NIA 12%</td>
<td>1-km BZ 23%</td>
</tr>
<tr>
<td>Greater Thames Marshes</td>
<td>NIA 41%</td>
<td>1-km BZ 16%</td>
</tr>
<tr>
<td>Humberhead Levels</td>
<td>NIA 10%</td>
<td>1-km BZ 39%</td>
</tr>
<tr>
<td>Marlborough Downs</td>
<td>NIA 31%</td>
<td>1-km BZ 38%</td>
</tr>
<tr>
<td>Meres and Mosses</td>
<td>NIA 16%</td>
<td>1-km BZ 39%</td>
</tr>
<tr>
<td>Morecambe Bay Limestones and Wetlands</td>
<td>NIA 20%</td>
<td>1-km BZ 46%</td>
</tr>
<tr>
<td>Nene Valley</td>
<td>NIA 22%</td>
<td>1-km BZ 47%</td>
</tr>
<tr>
<td>Northern Devon</td>
<td>NIA 8%</td>
<td>1-km BZ 46%</td>
</tr>
<tr>
<td>South Downs Way Ahead</td>
<td>NIA 63%</td>
<td>1-km BZ 17%</td>
</tr>
<tr>
<td>Wild Purbeck</td>
<td>NIA 35%</td>
<td>1-km BZ 48%</td>
</tr>
</tbody>
</table>

Source: Created by author from NIA shapefiles and land use data (Table 4.4).
Discussion

Three NIAs have been selected to examine their land use distributions and potential for buffering core sites in more detail. They are Dark Peak, a Management Group 1 NIA which is overwhelmingly priority habitat, Humberhead Levels, a Management Group 2 NIA, which is predominantly agricultural and Birmingham and the Black Country, a Management Group 3 NIA, which is urban. An illustration of the land use in each of these three NIAs, including core areas and buffer zones, can be found in Figure 5.8, which provides colour-coded maps of the areas.
Figure 5.8 Land use in core areas, designation area and 1-kilometre buffer zone of three NIAs: Dark Peak, Humberhead Levels and Birmingham and the Black Country, left to right.

a) Land use in core areas and designation area

Legend:
- Green: Priority Habitat
- Red: Agricultural
- Orange: Built-up
- Blue: Core Areas
- White: Environmental Stewardship Areas
b) Land use in 1-kilometre buffer zone

Source: Created by author using geospatial data including CEH Land Cover Map 25-metre raster and 1-kilometre raster and shapefiles for the NIAs and core areas (Table 4.4).
The core areas in Dark Peak are 100% priority habitat while the Dark Peak NIA 96% priority habitat, suggesting that the buffering potential is quite good as both the core areas and the NIA buffer both are predominantly priority habitat land use (more than 66% which is the cut-off for ‘good’ buffering potential). Agricultural and built-up land uses make up less than 1% of the NIA area combined. The area outside the Dark Peak NIA is 72% priority habitat, 26% agricultural and 3% built-up, also suggesting good buffering potential as, although there is comparatively less priority habitat, it is still the predominant land use (again, greater than 66%) so there is less agricultural land or urban land to impact the core areas. The comparatively high area of land under Environmental Stewardship Agreements further indicates good buffering potential; 66% of the agricultural area within the NIA is under HLS+ELS agreements and 23% of the 1-kilometre buffer zone is under HLS+ELS agreements, thus suggesting reasonably sustainable land management and further indicating that the Dark Peak NIA provides comparatively good buffering potential for its core areas.

Humberhead Levels is quite different to Dark Peak; the core areas in Humberhead Levels are 88% priority habitat, while the NIA is only 13% priority habitat and 82% agricultural. This would suggest a poor to moderate buffering potential (less than the 33% cut-off), depending upon the agricultural management strategies, discussed shortly. The buffer around the NIA is also largely agricultural, 82%, with some built-up areas which constitute 14% of the buffer zone and a little bit of priority habitat, approximately 4% of the buffer zone. 10% of the agricultural land area in the NIA is under an Environmental Stewardship Agreement while 39% of the 1-kilometre buffer zone is. This would suggest poor buffering potential as the priority habitat of the core areas is surrounded by agricultural land area which is predominantly not (substantially less than the 50% cut-off) under an Environmental Stewardship agreement.

Birmingham and the Black Country is different yet again; the core areas in this NIA are 62% priority habitat, 28% agricultural and 10% built-up. The NIA, however, is 79% built-up land use, 16% agricultural and only 5% priority habitat. Finally, the buffer zone around the NIA is 11% priority habitat, 62% agricultural and 27% built-up. This type of land use pattern would indicate that Birmingham and the Black Country does not have significant buffering potential, although results could be quite different at a smaller scale. In terms of Environmental Stewardship, only 1% of agricultural land within the NIA and 33% in the 1-kilometre buffer zone is under an HLS+ELS agreement, again indicating poor buffering potential.
Essentially, based upon the above criteria, only Dark Peak provides good buffering potential while Morecambe Bay, Wild Purbeck and South Downs provide moderate buffering potential and the rest provide poor buffering potential. South Downs was the only NIA with predominantly agricultural land use (71%) which might provide moderate buffering potential as more than 50% of the agricultural area (63% to be precise) is under Environmental Stewardship Agreement in the NIA. Of note is that the four NIAs which provide good or moderate buffering potential are all NIAs which overlap heavily with a landscape designation, that is, they are NIAs in Management Group 1; this might speak to the emphasis on continued engagement with landowners in NIAs which overlap with landscape designations. Ultimately, NIAs that are overwhelmingly agricultural or built-up land uses, such as those NIAs in Management Groups 2 or 3, will likely not have as much buffering potential as areas with more priority habitat although this depends upon how the agricultural land is managed. However, there are other advantages to including both agricultural and urban and suburban spaces in NIAs or other landscape designations, again as discussed in Section 4.1; the key is likely moderation and consideration of buffering potential of core spaces on a smaller scale than the one considered here. It is important to note that this is a landscape-scale analysis which employs broad categories of land use.

5.4.2 NIAs and the connectivity of England’s ecological network

This section explores the contribution of the NIAs to the connectivity of England’s ecological network. Connectivity is the ability of a specie of interest to move between two areas or nodes in a network. This work employs graph theory. Graph theory is a key tool for exploring spatial planning of protected area networks (see: Minor and Urban, 2008; Zetterberg et al, 2010; Crouzeilles et al, 2011; Foltête et al, 2014; Dilts et al, 2015; Hofman et al, 2018). Landscape graphs can help with spatial planning of networks and identifying optimal locations for increasing connectivity (Foltête et al, 2014).

Methodology

The connectivity analysis is derived from one conducted by Santini et al (2016) which considered the connectivity of the global network of protected areas but was adapted in order to assess the contribution of the NIAs to England’s ecological network. The
analysis used graphs or “mathematical structures composed by nodes that are connected by links” (Santini et al, 2016, p 200) as the basis to assess the connectivity of individual protected areas in England. Please see Figure 5.9 for a representation of this process.

Figure 5.9 A diagram illustrating the features of relevance to this analysis including the nodes, node attribute and dispersal paths.

The analyses performed consider connectivity at two levels: (i) intra-connectivity or the connectivity within individual landscape designations and (ii) inter-connectivity which is the connectivity within networks of designations or between landscape areas. The second, national-level analysis was done twice; once with the NIAs included and once without the NIAs to assess the contributions of the NIAs to the connectivity of England’s ecological network. In both analyses, individual protected or landscape areas (PAs) were the units of the connectivity analyses (that is, the nodes in the graph). As per Santini’s original study, all analyses were repeated for 12 dispersal distances which were defined in a previous study (Santini et al, 2013). The nodes were each given weights equal to the area of each, individual protected area or designation. The area feature thus forms the node attribute, which is the feature of the node that is specifically important to this investigation. The node attribute in this case, the area of an individual PA, was determined from the shapefiles in ArcGIS. The normalized Equivalent Connected Area (ECAnorm) (Saura et al, 2011) was then computed. This is “a connectivity metric that summarizes the percentage of reachable area in a PA network” (Santini et al, 2016, p 200) compared to either the total area of
the NIA (i) or England (ii) depending upon the analysis. “This metric was computed considering both area that can be reached within each PA (intra-PA connectivity) and area that can be reached through direct or indirect dispersal between PAs (inter-PA connectivity) (Saura & Rubio, 2010)” (Santini et al, 2016, p 200-201). ECAnorm would be 100% or equal to the PA coverage of the whole network in the most positive connectivity scenario where the probabilities of dispersal are equal to 1 among all protected areas indicating no barriers to dispersal. Similar to Santini et al (2016), this research produced connectivity response curves which are created by plotting ECAnorm against dispersal distance as a means to compare how connectivity changes across a range of dispersal distances relevant for mammal species (Saura & Rubio, 2010; Ernst, 2014).

As previously mentioned, the dispersal distances used in this research are those employed by Santini et al (2016). The researchers discuss their process as follows: “We defined the scales of analysis based on the dispersal distances of mammals with different home range sizes. We used the relationship between home range size and median dispersal distance (Santini et al, 2013) as follows. We divided the log-transformed home range size of mammals into bins of size 0.5 (spanning from 0.1 ha to 100 km²), resulting in 12 different values and encompassing the whole range of home range variability recorded in mammals. Based on the allometric equations from Santini et al (2013), we then estimated the corresponding median dispersal distance, ranging from 177 m to 99.58 km (see Fig. S1). This wide range of distances encompasses variability in dispersal distances observed in terrestrial vertebrates (Stevens et al., 2014)” (Santini et al, 2016, p 201). This approach appealed for this research because of the range of dispersal distances considered which allows for a more inclusive study.

CONEFOR26 software was used for this set of analyses. CONEFOR26 is a program that quantifies the “importance of habitat patches for maintaining landscape connectivity through graph structures and habitat availability indices” (CONEFOR SESINODE User’s Manual, 2007, p 6). There are two types of information that form the basis of a connectivity analysis in CONEFOR: distances and nodes. A set of nodes is called a graph and the links connect two different nodes. Nodes might represent different features, for example sites of a particular type or quality of habitat (in this study, they represent individual protected areas) and are enclosed by inhospitable areas or habitats (non-habitat) while links symbolise a specific distance between two nodes over which a species might potentially be able to move or disperse. This software was chosen because it has been widely used (see Zeigler et
al., 2013; Estreguil et al., 2012; Pascual-Hortal and Saura, 2007), was designed to be easy for non-expert users to employ and understand, and has a manageable, user-friendly interface.

There are a number of connectivity indices available to use in the Conefor system. This research uses the probability of connectivity or PC index which is the recommended probabilistic index for a probabilistic connection model. It "considers a richer connection model" (CONEFOR SESINODE User’s Manual, 2007, p 23) than other indices available and "is not affected by the presence of adjacent habitat patches or cells in the analysed datasets (Saura and Pascual-Hortal, 2007)" (CONEFOR SESINODE User’s Manual, 2007, p 23) which is important for this analysis. PC represents the probability that two random locations fall into the same protected area, or in protected areas that are connected to each other (either directly or indirectly through other PAs). Therefore, the PC metric accounts for both intra-PA and inter-PA connectivity. The PC essentially increases with enhanced connectivity and might span anywhere from 0 to 1. The developers of the model describe it using the following equation:

$$PC = \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} a_i a_j p_{ij}^*}{A_L^2}$$

in which \(n\) represents the total number of nodes (in this case individual designated areas) in the landscape, \(a_i\) and \(a_j\) represent the attributes of nodes \(i\) and \(j\) (in this case the size or area of the individual designated area), \(A_L\) is the maximum landscape attribute (in this case the total area of the study region which is either the NIA or England), and \(p_{ij}^*\) is the maximum product probability of all paths between nodes \(i\) and \(j\). A step is the direct dispersal of a specie of interest from one node to another and thus forms part of a set of steps whereby no node is visited more than once. The product of all the \(p_{ij}\) belonging to each step in a path is termed the product probability of that path. The term \(p_{ij}^*\) is described as the maximum product probability of all achievable paths between habitat nodes \(i\) and \(j\) and is the term considered in this research.

The maximum product probability takes into account both direct and indirect paths or dispersal possibilities between \(i\) and \(j\) (with indirect options being those paths that pass through other nodes that are different from \(i\) and \(j\)); see Figure 5.9 for an illustration. The maximum product probability will then be higher than the direct dispersal probability (when an indirect pathway is more likely (more probable) than a single-step direct movement between \(i\) and \(j\) (Saura and Pascual-Hortal, 2007; Saura
and Rubio, 2010). If nodes $i$ and $j$ are within the specified dispersal distance, the maximum probability path will just be the step (that is, the direct path of movement) between nodes $i$ and $j$ ($p^*_{ij} = p_{ij}$). If nodes $i$ and $j$ are farther apart than the specified dispersal distance, the “best” (maximum probability) path could involve numerous steps through transitional or steppingstone nodes resulting in $p^*_{ij} > p_{ij}$. When two nodes cannot be dispersed between, that is they are totally isolated, because they are too far apart or some feature that hinders the movement between the two nodes, then $p^*_{ij}=0$. When $i=j$ (when the nodes overlap) then $p^*_{ii}=1$ (the probability of dispersal is one as it is definite that a specie of interest could move between two overlapping nodes); essentially, a node is acknowledged in and of itself as a space in which connectivity exists, illustrating the habitat availability concept of the PC metric.

If the node attribute is area, as it is in this case (designation area), then $A_L$ is the entire region of interest including both suitable and non-suitable spaces and PC=1 when the entire region is covered by a designation in this study. PC, in this situation, would thus be defined as the probability that two individuals arbitrarily placed within the region of interest are in two spaces that are accessible to one another, that is connected, based on the nodes and the steps between them ($p_{ij}$).

The determination of the PC index used in this research necessitates calculating the maximum probability paths which can be challenging to process as its quite computationally demanding in situations with a sizeable number of nodes. Using the PC metric allows for modelling the region as a whole graph with a specified probability of direct dispersal ($p_{ij}$) between each and every pair of nodes, even if the value is close to zero. Therefore, the PC index requires more processing time and as a result has a lower limit for maximum number of nodes when compared to other indices. For this analysis, all nodes present in an analysis were used; as the analysis was focussed on the specific landscape designations, of which there are 54, and the nodes within them, processing power was not an issue. The connectivity analysis also calculates the $d_i$ or $d_{PC}$ value ($d$ being the letter assigned to the value and PC referring to the index used in the analysis) which is the importance of a specific node in maintaining connectivity in the system.

This form of connectivity analysis does not provide information regarding the ability of an animal to disperse between two sites; it does not take into account the potential obstacles to dispersal such as roads or other types of barriers. What it does provide is an overview of the current state of the ecological network with regard to planning and where there are holes, particularly with regard to landscape designations,
essentially spatial planning and distribution. Although existing landscape
designations such as AONBs and NPs do not necessarily provide additional benefits
with regard to the quality of nature within them (Lawton et al, 2010), they are a focus
for the Lawton Report and improving the connectivity or coverage of protected areas
within them is one of the recommendations of the report. Furthermore, it is also
valuable to see where there are holes in the existing network of landscape
designations as these are areas where NIAs might be well placed to undertake
valuable habitat creation and restoration work. Of note is Table 4.6 which illustrates
that NIAs which overlap with a landscape body, that is NIAs in Management Group
1, have a greater percentage of their areas also covered by SSSIs, the most common
designation for small protected areas in England which form a key feature of the
connectivity analyses.

Results

With regard to the inter-connectivity of the NIAs, 3.9% of land area in mainland
England is covered by the 12 areas, and the ECAnorm, that is the percentage of
reachable area in a network, for the different dispersal distances ranged from 1.2%
to 2.6% of total country area (for the smallest and largest dispersal distances of 177
meters and 99,580 meters, respectively). This indicates a small to moderate
connectivity within the NIA network (as 3.9% would be the maximum possible
ECAnorm value as it is the percentage of England covered by the NIAs); in other
words, a third to two thirds of the NIA network is reachable depending upon the
dispersal distance. These are similar to the ECAnorm values for both the AONBs and
NPs. In Section 4.3, which explored the biophysical features of the three landscape
designations, National Parks were found to have a larger percentage of their areas
covered by small, protected area designations than either NIAs or AONBs as shown
in Figure 4.7. The area within a landscape designation covered by small, protected
areas plays an important role in the calculation of the ECAnorm values but it is not
only the extent of the area covered but also the relative location which plays an
important role in connectivity; the more area covered by core spaces, the better the
ECAnorm value will likely be, but only if the core areas are near enough to one
another to be accessed with the specified dispersal distances. Thus, it should be
noted that the NPs do not perform significantly better with regard to connectivity
despite having a larger percentage of their area covered by small protected, core
areas which indicates that improvements could be made with regard to the planning
of small protected areas within all landscape designations including the NIAs. **Figure 5.10** shows the range of ECA norm values for the NIAs, AONBs and NPs.

**Figure 5.10** Box plot showing the range of ECAnorm values of the intra-connectivity analysis for the individual areas of the three landscape designations.

![Box plot showing the range of ECAnorm values for the NIAs, AONBs, and NPs.](image)

*Source: Created by author from results of intra-connectivity analysis.*

How then do individual NIAs ECAnorm values vary with regard to Management Group if NPs and AONBs are no different to NIAs? Areas which overlap significantly with another landscape designation, that is NIAs in Management Group 1, do significantly better with regard to ECAnorm values when compared to NIAs in the other two Management Groups in general although there is one NIA in Management Group 3 that has a high ECAnorm value, Greater Thames Marshes. NIAs in Management Group 2 perform worst (average: 2.4), while NIAs in Management Group 3 fall in the middle of the pack (average: 6.0) and NIAs in Management Group 1 best (average: 19.3). This follows the same trend with regard to percentage of area within an NIA also designated as an SSSI, as seen in Table 4.6.

ECAnorm values were also graphed with the average species richness per square kilometre for each of the 54 landscape designations (the 12 NIAs, 32 AONBs and 10 NPs in England) to explore the potential relationship between connectivity and biodiversity. It would be expected that improved connectivity within a landscape designation would also facilitate improved species richness by allowing species to disperse (Hanksi, 1998). Indeed, the results show that higher intra-connectivity values are positively correlated, albeit weakly, with species richness, as seen in **Figure 5.11**.
Figure 5.11 A scatter plot of average species richness per square kilometre and intra-connectivity for the 54 individual areas of the three landscape designations assessed in England (NIAs, AONBs and NPs) to explore the relationship between connectivity and biodiversity.

The four NIAs that have the greatest average PS richness and ECA norm values are all areas in Management Group 1.

Source: Created by author from results of intra-connectivity analysis.

When examining the relative contribution of the individual NIAs to connectivity at a national scale, the individual NIAs contribute less to the connectivity of the network on average than either the AONBs or NPs. This is assessed by examining the dPC value of an area, which indicates the importance of a specific node in maintaining connectivity in the system as previously mentioned. The dPC value is entirely relative; the greater the value, the larger the contribution to connectivity but merely in comparison to other nodes within the network. Figure 5.12 shows the average dPC values for the NIAs, AONBs and NPs at the range of dispersal distances assessed. The NIAs do not contribute as significantly to connectivity of the ecological network as do either the AONBs or NPs on average.
Figure 5.12 Average of the contribution of individual nodes within a designation type for each of the areas in the three landscape designations for a range of dispersal distances.

Source: Created by author from results of inter-connectivity analysis.

Discussion

The contribution of an area to the connectivity of the ecological network varies between individual NIAs, however. Those NIAs which stand out are discussed here. All of the features discussed are illustrated by Figure 5.13 which provides a map of all the NIAs, AONBs and NPs in mainland England. The NIA that contributes most at lower dispersal distances is Northern Devon with a dPC value of 9.62. Northern Devon NIA is located in the south-west of England where it helps to fill in gaps between other nearby landscape designations and thus contribute to connectivity at lower dispersal distances. The NIA that contributes least to connectivity at smaller dispersal distances is Dearne Valley with a dPC value of 0.03, illustrating a difference of three orders of magnitude, which is quite substantial. Dearne Valley likely contributes less because it’s comparatively smaller and more isolated.
The NIA that contributes most at greater dispersal distances is Birmingham and the Black Country with a dPC value of 4.82. Again, this is likely because it fills in gaps between other, relatively close-by landscape designations. The NIA that contributes least at greater dispersal distances is Marlborough Downs with a dPC value of 0.60, again illustrating a difference of an order of magnitude. Marlborough Downs is quite small and almost entirely covered by another landscape designation, an AONB, thus reducing its contribution to the connectivity of the system overall, particularly at greater dispersal distances. It is also worth noting that Nene Valley NIA is quite isolated in the middle eastern part of England. It contributes moderately to connectivity within the network, however, in that it does cover a larger area than other NIAs by virtue of its size even though it is more isolated and fragmented.

Despite their lower comparative individual performance, the NIAs do contribute to the connectivity of the landscape designations as a whole in England, particularly at greater dispersal distances. Without the NIAs included, the landscape designations (AONBs and NPs) have an ECAnorm, again the percentage of reachable habitat, of...
6.63% for the smallest dispersal distance and an ECAnorm of 18.86% for the largest dispersal distance out of a maximum of 23.7%, the total coverage of AONBs and NPs in England. With the NIAs, the landscape designations have an ECAnorm of 7.46% for the smallest dispersal distance and an ECAnorm of 22.96% for the largest dispersal distance out of a maximum of 24.35%.

The contribution of the individual landscape areas to the connectivity of the system largely depends upon the size and shape of the area in question, the extent of coverage of the landscape designation and the core areas within it and the location of both the core areas and the designation in relation to others. The NIAs are on average smaller than the AONBs or NPs, they are not particularly circular in shape and their mixed-use nature means that some, particularly those in Management Groups 2 and 3, are located in urban / suburban areas and thus potentially distant from other landscape areas designated for their aesthetic beauty. All of these factors might contribute to the fact that the NIAs do not appear to contribute as consistently to the connectivity of the ecological network when compared to other landscape designations. This discussion alludes to the impact of context and NIA Management Groups; NIAs which overlap heavily with another landscape body have a greater percentage of their area also designated as small protected areas and therefore might appear to be best placed to make gains in connectivity within the existing network. However, what NIAs in Management Groups 2 and 3 can provide is coverage of areas and the potential for gains in spaces not traditionally included in the existing ecological network of landscape designations.

5.5 Were there win-win opportunities for biodiversity and ecosystem service delivery in the NIAs?

This section presents the results of the assessment of synergies and trade-offs between biodiversity and selected ecosystem services at a landscape scale in the NIAs and other landscape designations in England. The methodology of analysis is described first in Section 5.5.1 and the results presented in Section 5.5.2. The segment describes the:

i. Selection of indicators and data sources for each (Table 5.6);
ii. Spatial analysis methodology and quantification of indicators (Table 5.6); and
iii. Development and graphical presentation of landscape-scale synergies and trade-offs between biodiversity indicators and services (Section 5.5.2).
Details of the methods followed in selecting and assessing ecosystem service provision are provided in Chapter 3. It should be noted that only services for which there is a synergy or trade-off are presented here although all ecosystem services touched on in the Lawton Report (Lawton et al, 2010) and then further emphasised the NIA Guidance Notes (NIA 1) and Criteria (NIA 2) have been tested; these services include agricultural land value, carbon storage, recreation (an amalgamation of the key cultural services addressed by the NIA literature and monitoring system), water quality, flooding and urban space. It should be noted that these analyses represent a snapshot in time; there is no temporal consideration nor any ‘cause-and-effect’ analysis of the implementation of the NIAs due to limited data availability. This work provides a model of potential synergies and trade-offs in biodiversity conservation and ecosystem service delivery in NIAs and considers these with regard to the Management Group typology first presented in Chapter 4.

Section 5.5 is specifically examining whether the NIA Initiative met its own needs in terms of national objectives 5 and 6, respectively:

- “Benefits to urban area and communities can be achieved and, where appropriate, NIAs may contain urban areas as part of an enhanced ecological network;
- ‘Win-win’ opportunities are identified and have the potential to be exploited to the full to derive multiple benefits, for example with benefits for the water environment and Water Framework Directive objectives, flood and coastal erosion risk management and the low-carbon economy,” (NIA 1, p 5).

5.5.1 Selection of indicators and data

In this study, a total of seven criteria and ten indicators were selected for the analyses. Drawing on existing synergy and trade-off assessments (UK NEA, 2011), indicators were first identified, followed by a list of data sources for each indicator (see Table 5.7). Both indicators and data sources were then re-evaluated, and a final list developed using knowledge of the objectives and targets of the individual NIAs and the Initiative as a whole. The methodology integrates established, easily quantifiable indicators that are widely used in synergy and trade-off assessments in the UK alongside atypical, qualitative data from both NIA literature and the interviews to examine the potential for the NIAs to achieve positive benefits for both wild nature conservation and the delivery of specified ecosystem services.
Table 5.7 The indicators selected for use in the biodiversity conservation and ecosystem service delivery synergy and trade-off analyses.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Indicator</th>
<th>How it is measured</th>
<th>Data Set / Source</th>
<th>Predicted functional relationship with biodiversity indicators</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>Habitat</td>
<td>Extent of priority habitat</td>
<td>Average area of priority habitat / km²²</td>
<td>Natural England PHL, March 13, 2016</td>
<td>N / A</td>
<td>Priority habitats are habitats of conservation concern in England and efforts to conserve them provide benefits for wild nature overall.</td>
</tr>
<tr>
<td></td>
<td>Priority species richness</td>
<td>Count of priority species types / km²²</td>
<td>NBN Priority Species Observations, May 11, 2016</td>
<td>N / A</td>
<td>Priority species are species of conservation concern and if species of conservation concern are surviving or even prospering, likely species who might require fewer conservation interventions but which are in the same species are also surviving.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agricultural land value</td>
<td>Extent of good quality agricultural land</td>
<td>Average area of agricultural land classes 1, 2 and 3 / km²²</td>
<td>Natural England Agricultural Land Classification, data.gov.uk, August 11, 2016</td>
<td>Trade-off</td>
<td>The Agricultural Land Classification provides a framework for grading land with regards to its agricultural value, specifically its long-term use, land which is thus not available for conservation purposes (Foley et al, 2005; Lambin &amp; Meyfroidt, 2011; Tilman et al, 2011; Fischer et al, 2013).</td>
</tr>
<tr>
<td></td>
<td>Above and below ground carbon storage</td>
<td>Tons of carbon / hectare</td>
<td>Aboveground_Carbon &amp; Model estimates of topsoil carbon, data.gov.uk, January 1, 2017</td>
<td>Synergistic</td>
<td>Synergistic</td>
<td>Many natural ecosystems store carbon in soil and vegetation, thus helping address climate change while also protecting wild nature (Broadmeadow &amp; Matthews, 2003; Dawson &amp; Smith, 2007; Diaz et al, 2009; Larsen et al, 2011). The data sets provide estimates of above and below-ground carbon storage in biomass to a depth of 15 centimeters.</td>
</tr>
<tr>
<td></td>
<td>N03 Concentration</td>
<td>Average concentration in milligrams / litre</td>
<td>ORViVa model provided by the Land, Environment, Economics and Policy Institute at the College of Social Sciences and International Studies, University of Exeter</td>
<td>Synergistic</td>
<td>Synergistic</td>
<td>Positive land management is often a cost effective means to address water quality which has benefits for both people and wild nature (Keirle &amp; Hayes, 2007; Grand-Clement et al, 2012; Smith, 2013). This data set identifies areas with rivers that are high in nitrates and thus likely have problems with diffuse pollution which might be addressed by NIA actions.</td>
</tr>
<tr>
<td></td>
<td>Annual visitor numbers</td>
<td>Visitor numbers / year</td>
<td>(ORViVa) model provided by the Land, Environment, Economics and Policy Institute at the College of Social Sciences and International Studies, University of Exeter</td>
<td>Synergistic and trade-off</td>
<td>Synergistic</td>
<td>Recreation can contribute to both physical and mental health and well being for people but can also prove both beneficial and detrimental to natural spaces; in other words, recreation as an ecosystem service can be both a synergy or trade-off with regards to wild nature (Welsh et al, 2014; Pickering, 2010). The recreation data was derived through use of a person-level model in that produces estimates of the recreational behaviour of an adult person with specific characteristics occupying particular place in England. The model modifies its estimates according to a number of factors, including the socioeconomic characteristics of people, the weekly or monthly timing, the attributes of a greenspace as well as the availability and qualities of alternative greenspaces. The model provides estimates based on data collected in the Monitor of Engagement with the Natural Environment (MENE) survey.</td>
</tr>
<tr>
<td>Ecosystem Services</td>
<td>Recreation</td>
<td>Extent of built-up land</td>
<td>Average area of built-up land / km²²</td>
<td>CEH Land Cover Map, 2015, 1km and 25m raster data for the UK, April 9, 2017</td>
<td>Trade-off</td>
<td>This data explores the area of urban and suburban land use in England, land which is thus not available for conservation purposes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extent of historical flooding</td>
<td>Average area of historical flooding / km²²</td>
<td>Recorded Flood Outlines, data.gov.uk, April 10, 2017</td>
<td>Synergistic</td>
<td>Positive land management which uses natural ecosystems to delivery water management and alleviate flooding can provide benefits for both people and wild nature (Morris et al, 2004; Costanza et al, 2008; Gedan et al, 2010). This data explores areas known to have flooded in the past and which might benefit from natural flood defences provided by certain types of habitat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extent of area of residential buildings and critical infrastructure at risk of flooding</td>
<td>Average area of residential buildings and critical infrastructure at risk of flooding / km²²</td>
<td>Flood Risk Areas, data.gov.uk, April 10, 2017</td>
<td>Synergistic</td>
<td>Positive land management which uses natural ecosystems to delivery water management and alleviate flooding can provide benefits for both people and wild nature (Morris et al, 2004; Costanza et al, 2008; Gedan et al, 2010). This data explores important areas of residential buildings and critical infrastructure which might flood and which might benefit from natural flood defences provided by certain types of habitat.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Extent of area with a 1 in 1000 (0.1%) chance of flooding each year &amp; extent of area with a 1 in 100 (1%) or greater chance of flooding each year</td>
<td>Average area of Flood Zones 2 &amp; 3 / km²²</td>
<td>Flood Zones 2 &amp; 3, data.gov.uk, April 12, 2017</td>
<td>Synergistic</td>
<td>Positive land management which uses natural ecosystems to delivery water management and alleviate flooding can provide benefits for both people and wild nature (Morris et al, 2004; Costanza et al, 2008; Gedan et al, 2010). This data explores areas with a high risk of flooding and which might benefit from natural flood defences provided by certain types of habitat.</td>
</tr>
</tbody>
</table>

Source: Compiled by author (NBN²; CEH²,⁴; all other data¹)
Throughout, the quality and value of selected indicators were critically scrutinised. The NIAs provide a unique opportunity in that they allow for analysis across scales, largely because of the extensive data available for the UK; although smaller units than national analyses, they also operate at larger scales thus enabling the use of national data sets provided by the UK government, as well as in-depth qualitative analysis of the discrete management unites. Table 5.5 provides a final list of the selected indicators and data sources. The selected indicators conform to the parameters highlighted in Chapter 3 and exemplify measurable and policy-relevant, if basic, features of biodiversity and the ecosystem services which they are meant to represent; however, it is not always possible for single indicator to perfectly represent all aspects of the phenomenon it is meant to characterise. A description of selected criteria is provided.

For biodiversity, two primary indicators were chosen. Rational for the selection and enumeration of these indicators is shown in Table 5.5 and is briefly discussed below.

1. Area of priority habitat: Priority habitat is a commonly used and policy relevant indicator of biodiversity in studies examining the UK (see Defra, 2014). The priority habitat identification covers a wide range of semi-natural habitat types, specifically habitats classified as most under pressure or threatened and thus requiring some type of conservation intervention under the UK Biodiversity Action Plan (UK BAP). The UK government provides a data set of the priority habitat in the UK called the Priority Habitat Inventory or PHI data set which details the location and extent of all priority habitat in England. The accompanying report of the data layer recommends that when using the PHI to estimate the extent of habitats, as is being done in this research, that only the Main Habitat field is used. Thus, this research uses only the Main Habitat field, acknowledging that this could potentially decrease accuracy slightly, as the Main Habitat field is more appropriate for larger-scale analyses such as these. The analyses include all habitat categories but four: Grass moorland, Fragmented heath, Good quality semi-improved grassland and No main habitat which are not priority habitats and thus excluded from the analysis.

2. Priority species richness: Priority species richness was used as the second biodiversity indicator. The methods used are similar to those employed in a study by Eigenbrod et al (2009) where they were considering the ecosystem service benefits and delivery of different, contrasting conservation strategies in England. Priority species, like priority habitats, also require some type of
conservation intervention under the UK Biodiversity Action Plan. Eigenbrod et al (2009) chose priority species as a measure of biodiversity because “these 'species of conservation concern' arguably require the greatest protection in order to persist” (Eigenbrod et al, 2009, p 2906) with the assumption being that if species of conservation concern are surviving or even prospering, likely species who might require fewer conservation interventions but which are in the same spaces are also surviving. The methodology employed here is similar and uses the recorded presences of six groups, namely BAP bryophytes, vascular plants, butterflies, herptiles, mammals and birds, in England at a 1-kilometre by 1-kilometre grid resolution to calculate species richness.

The data incorporated into this study was limited to those records that have certain qualities, for instance, in terms of accuracy of the record. There is still the potential for bias in the data but given the focus on priority species and the widespread use of the data in other notable research (see, for example, Mossman et al, 2015; Dolman et al, 2012; Jackson and Gaston, 2008), the data is considered to be of acceptable quality for this study particularly as this study uses a species richness indicator. Species richness looks at only the total number of different species found in an area to limit error associated with multiple surveys of the same areas / individuals or with different methodological approaches / concentrations. There is still some bias associated with the location of surveys in that areas that are easier to access or known to contain certain species will be better studied as opposed to more remote regions where species might be missed as a result of the difficult in surveying those areas, but this is true of almost any survey data. The data for this study were limited to 325 priority species of bird, butterfly, amphibian, reptile, vascular plant and bryophyte found in England and refined to keep only records which were accurate to a 1-kilometre area or less that had been collected in or after the year 2000.

For ecosystem service delivery, eight indicators were chosen. Rational for the selection and details of these indicators is shown in Table 5.6 and is discussed below.

3. Agricultural land value: The analyses in this research use the agricultural land classification framework and data set to select land with a grade of 1, 2 or 3 and measure the extent of land of agricultural value in England and in the landscape designations of interest. Land that has agricultural value is unlikely to be used for other purposes, such as conservation, and thus constitutes a
trade-off with biodiversity conservation (Foley et al, 2005; Lambin and Meyfroidt, 2011; Tilman et al, 2011; Fischer et al, 2014). Agriculture is also a large land use in the UK, a pressure which is likely to continue given current population trends (Foresight Land Use Futures 2010 in Lawton et al, 2010).

4. Carbon storage: Data from two separate data sets were combined to assess the above and below-ground carbon storage for England. The 2007 mean value for soil carbon concentration data was used in this analysis. Land used for biodiversity conservation, particularly certain types of habitats such as lowland bogs, can store significant amounts of carbon (Broadmeadow and Matthews, 2003; Dawson and Smith, 2007; Diaz et al, 2009; Larsen et al, 2011) thus helping address climate concerns.

5. Water quality: Water quality examined the mean concentration of nitrates or NO3 from diffuse pollution from a variety of sources, including agriculture, highways, urban runoff, onsite wastewater treatment systems, atmospheric deposition, wastewater treatment works effluent, storm tanks / combined sewer overflows and industrial discharge. Positive land management is often a cost-effective means to address water quality which has benefits for both people and wild nature (Keirle and Hayes, 2007; Grand-Clement et al, 2015; Smith, 2013). It should be noted that extreme water pollution events have important impacts on wild nature as even one event can reduce the biodiversity of an ecosystem, even if the water quality is generally good the rest of the time. It should be noted that while biodiversity conservation and water quality are considered to have a synergistic relationship, it would appear as a negative trend on a graph as greater priority habitat would be associated with a smaller concentration of NO3 were there an indicated relationship.

6. Recreation: Recreation was assessed using a model which estimates the annual number of visitors to a site based on a variety of physical features of the site and visitor behaviours. Recreation can have both a synergistic or trade-off-type of relationship with biodiversity conservation in that it can contribute to both physical and mental health and well-being for people but can also prove both beneficial and detrimental to natural spaces (Wolch et al, 2014; Pickering, 2010). Recreation, partially driven by access, is also uneven in distribution; visitors will likely gravitate towards easily accessible spaces with specific features of interest and thus investment and impact can often be focused on reachable, charismatic spaces or those with certain species thus potentially overlooking important, albeit perhaps not as obvious, landscapes, ecosystems or species (Jennings and Gaither, 2012; Sen et al, 2014; Thiene
et al, 2017). The data in this analysis was derived using the ORVal Model which provided estimates visitor numbers to landscape designations (https://www.leep.exeter.ac.uk/orval/). The model is valuable in that it considers recreational activities over all greenspaces in England where those greenspaces are differentiated not only in their location but in the recreational experience they offer. The ORVal model was chosen for its policy relevance; one of the principal modellers who developed the tool also worked on the UK NEA examining recreation as an ecosystem service (Bateman et al, 2014) and the tool in fact featured in the 25 Year Environment Plan where the government committed to: “Continuing our ground-breaking work with Exeter University to update the world-leading Outdoor Recreation Valuation Tool (ORVal) in 2018,” (Defra, 2018b, p 77). The other lead modeller has worked extensively on the UK Land Cover Map, a key data set for this work, the ORVal model and other research (see Morton et al, 2011). Read more at https://www.exeter.ac.uk/leep/research/orval/#oOiyXj3KFHk5j7FW.99.

7. Built-up land: Urban or suburban areas do not provide a specific ecosystem service but they do contain a significant and important part of the population of England as discussed in Chapter 4 and their location can contribute to the provision of certain ecosystem services, particularly cultural ecosystem services; for instance, NIAs covering urban areas can create or improve green spaces for biodiversity conservation within those urban areas thus improving access and recreation for people in more built-up areas (UK NEA, 201). However, the extent to which urban and suburban green spaces can contribute to biodiversity conservation is likely to be limited in many cases as a result of certain biophysical features of the spaces, for example connectivity (Rudd et al, 2002) to other spaces or pollution (Gobel et al, 2007). As previously discussed, built-up areas are a competing land use to that used for biodiversity conservation and thus, at a larger scale, one would expect a trade-off between the two land uses (McKinney, 2008).

8. Flooding: Three different indicators are used to assess flooding and provide a better picture of areas likely to flood in the future. The relationship between flooding and biodiversity is considered to be synergistic in that areas with a greater extent of natural space will provide better absorption of water than other types of land use, for instance urban or suburban, and thus are likely to help reduce flooding. Some habitats actually provide natural flood defences including bogs and wetland among others (Morris et al, 2004; Costanza et al, 2008; Gedan et al, 2010). It should be noted that while biodiversity
conservation and flooding are considered to have a synergistic relationship, it would appear as a negative trend on a graph as greater priority habitat would be associated with reduced flooding were there an indicated relationship.

5.5.2 Identification of potential synergies and trade-offs between biodiversity and ecosystem service delivery in the NIAs: Are there win-wins?

This next section examines potential synergies and trade-offs between biodiversity and ecosystem services in the individual NIAs and consider these in the context of the Management Group typologies. There are two steps to this process, the first which establishes a potential synergy or trade-off by graphing the values for a square kilometre for both biodiversity and an ecosystem service for the whole of England then examining the correlation trend; and the second which 'maps' the average value per square kilometre for both biodiversity and an ecosystem service for an individual landscape area on a graph which is divided into quadrants based on the averages per square kilometre for England to show whether an individual area provides win-win opportunities. For the first assessment, Table 5.8 shows a set of correlations between per-unit (1 km²) biodiversity and ecosystem service values for England.
Table 5.8 Correlations among per-unit-area (1 km\(^2\)) biodiversity and ecosystem service values in England (n = 147,203 except for the water quality correlations where n = 23,808; Pearson correlation coefficients).

<table>
<thead>
<tr>
<th></th>
<th>Priority Habitat</th>
<th>Priority Species Richness</th>
<th>Agricultural Land Value</th>
<th>Carbon Storage</th>
<th>Urban / Suburban Land</th>
<th>Recorded Flood Outline</th>
<th>Flood Zones 2 &amp; 3</th>
<th>Water Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority Habitat</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Priority Species</td>
<td>0.05</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Agricultural Land Value</td>
<td>-0.26</td>
<td>&lt; 0.01</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Carbon Storage</td>
<td>0.31</td>
<td>0.03</td>
<td>0.26</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Urban / Suburban Land</td>
<td>-0.09</td>
<td>0.09</td>
<td>-0.23</td>
<td>-0.46</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Recorded Flood Outline</td>
<td>0.09</td>
<td>0.03</td>
<td>0.03</td>
<td>&lt; 0.01</td>
<td>0.02</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Flood Zones 2 &amp; 3</td>
<td>0.09</td>
<td>0.01</td>
<td>0.13</td>
<td>-0.01</td>
<td>&lt; 0.01</td>
<td>0.55</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Water Quality</td>
<td>-0.13</td>
<td>0.01</td>
<td>0.19</td>
<td>-0.21</td>
<td>0.1</td>
<td>0.17</td>
<td>0.2</td>
<td>1</td>
</tr>
</tbody>
</table>

*Determined by author from concurrence analyses.*

Agricultural land use is the only ecosystem service which graphically indicates a stronger trade-off with biodiversity conservation, namely the priority habitat indicator, although urban land use also correlated negatively with priority habitat. The priority species indicator was not particularly strongly correlated with any ecosystem service indicator except recreation which is likely to be indicative of species records occurring where people visit most. In contrast, carbon storage and, to a lesser extent, water quality are ecosystem services which suggest a synergistic relationship with biodiversity conservation. It should be noted that the water quality indicator, concentration of NO3, presents as a negative correlation which indicates that NO3 concentrations decrease with increasing priority habitat area, or that improved water quality is correlated with larger areas of priority habitat, thus the synergistic relationship. Many of the correlation coefficients are quite low, which is not unexpected in large-scale analyses (see Naidoo et al, 2008); however, certain trends do stand out.
Agricultural land use is negatively correlated with urban land use and water quality, though positively correlated with carbon storage in the England-wide correlation, likely because some agricultural land is grassland for grazing which might indeed store carbon. Agricultural land use is negatively correlated with carbon storage for the landscape areas and agricultural land use is considered to be a trade-off with carbon storage for this assessment as is generally accepted with standard agricultural practices in the literature (Lal, 2015; Johnson et al, 2014; Govaerts et al, 2009). Carbon storage is negatively correlated with urban land use and negatively correlated with NO3 concentrations; in other words, land which is good for carbon storage is also good for water quality. For the purpose of this assessment, carbon storage, recreation, flood mitigation and water quality are considered to be provide synergistic opportunities with regard to biodiversity conservation. Large areas of agricultural and / or urban land use, however, are considered to result in trade-offs with biodiversity and all of the aforementioned services. The quadrant graphs of individual landscape areas for ecosystem services which indicate a synergistic or trade-off type of relationship are displayed in Figure 5.14 and a table of the Pearson correlation coefficients for the landscape area graphs can be found in Appendix VI along with the rest of the plots.

To demonstrate potential synergies and trade-offs within individual areas, the indicator of biodiversity is presented on the x-axis and the ecosystem service indicator is presented on the y-axis, thus forming a scatter plot where each point is representative of one landscape designation area, an individual NIA, AONB or NP. The two other types of landscape designations, AONBs and NPs, are used to provide additional data in order to examine trends. Together with the 12 NIAs, the 32 AONBs and 10 NPs on the mainland of England populate a graph and illustrate the relationship between the two biodiversity indicators and the various ecosystem services assessed. The figures also provide the average value for England in the form of a solid line, thus illustrating whether an individual landscape has, for example, more priority habitat per square kilometre on average than the equivalent average for mainland England or less. This is done for both the biodiversity indicator as well as the ecosystem service indicator. In this way, four quadrants are formed that provide an illustration of whether an area could be considered to be in a win-win situation, a trade-off situation or somewhere in between. Potential synergies and trade-offs are discussed for individual NIAs but not all NIAs are necessarily discussed for each service; those NIAs which provide particularly interesting examples are touched on.
Finally, it assesses the success or otherwise of the individual NIAs in providing win-win scenarios for all the services at the end of the section.

**Figure 5.14** Scatter plots showing the biodiversity conservation and ecosystem service delivery of certain services in individual landscape designations as well as the averages for England.

a) Agricultural land
b) Carbon storage and Recreation

![Graph showing carbon storage and recreation values for different habitats.]

- **Carbon storage (avg / km²)**: Y-axis ranging from 0 to 200.
- **Priority habitat (avg area / km²)**: X-axis ranging from 0 to 0.8.

**Legend**:
- AONB
- NIA
- NP
- England Avg

**Graph 1**: Comparison of carbon storage between different habitats and the England average.

**Graph 2**: Comparison of recreation values (Annual visitor numbers / km²) across different habitats and the England average.
c) Water quality

![Graph showing water quality and biodiversity conservation in NIAs](image)

Biodiversity conservation and the NIAs

Drawing on the analysis from Chapters 4, specifically Figure 4.8 exploring the potential biodiversity conservation in the NIAs, half of the NIAs have values above the average for England for both biodiversity indicators, that is extent of priority habitat and priority species richness. These six NIAs include all four NIAs in Management Group 1 and one NIA from each of Management Group 2 and 3. Four NIAs are mixed; they have below average values for England for the priority habitat indicator but above average values for England for the priority species indicator. These four NIAs are
Birmingham and the Black Country, Marlborough Downs, Meres and Mosses and Nene Valley. These four areas have among the smallest areas of priority habitat outright as well as the smallest percentages of total area that is priority habitat for the NIAs. They do not necessarily have high priority species richness overall, that is, a high priority species richness value for the entire landscape area but a larger number of the individual grid squares within these NIAs have higher priority species richness resulting in a higher average for the landscape area as a whole. Essentially, it potentially indicates the presence of a certain number of more wide-spread species. Thus, these NIAs, despite their smaller areas of priority habitat, could potentially have reasonable populations of some priority species and perhaps contain high-quality, though small in extent, natural areas. They would likely benefit particularly from habitat creation.

Finally, two NIAs have values below the averages for England for both biodiversity indicators; they are Dearne Valley and Northern Devon. Dearne Valley is the second smallest NIA and has about 8% of its area classified as priority habitat. It also has a reasonably large urban space which covers approximately 32% of its land area which likely contributed to the fact that only 15% of the grid squares in Dearne Valley had a record of any of the species included in this analysis (the average for the NIAs is 21%). Northern Devon is the largest NIA, but it does not have a particularly large area of priority habitat relative to its size, only 10% of its total area, which is well below the average of 22% for the NIAs. While these areas might not be above the average for England for either priority habitat extent or priority species richness, this analysis does not provide any indication of the type or rarity of the habitats or species that they do contain. Northern Devon, as an example, focuses heavily on Culm Grassland in its objectives and targets, which is falls under the Purple moor grass and rush pastures in the priority habitat classification; it is a rarer type of habitat in England, covering only 0.07% of mainland England compared to an average of 0.5% for all priority habitat types. It is also poorly covered by other designations; only 53% of it is covered by any type of designation as compared to the average of 75% for all priority habitat types. Furthermore, as Northern Devon highlights in their business plan, “35% of the UK Culm grassland resource is supported within the project boundary,” (Northern Devon Business Plan, 2012, p 10). Northern Devon also contains a grid square with a species richness of 12, the highest of any NIA for this data set. However, only 12% of its grid squares had a record of any of the species included in this analysis, the lowest of all the NIAs; this could be a function of fragmentation as Northern Devon does in fact have the lowest intra-connectivity score of all 12 NIAs. In other words,
both Dearne Valley and Northern Devon would benefit from habitat creation and improved connectivity both within but also between designated areas. The above analysis provides some indication and a comparative analysis, but not the entire story.

What this analysis illustrates overall is that NIAs in Management Group 1 have significantly larger areas of priority habitat and priority species richness for their size than NIAs in Management Groups 2 or 3. Furthermore, this is likely to have implications for synergies and trade-offs between carbon storage, recreation, water quality and flood management on the one side and agricultural or urban/suburban land uses on the other.

Agricultural land

No NIAs had a larger average area of priority habitat per square kilometre than the average for England and a larger average area of agricultural land per square kilometre than the average for England. One NIA, Marlborough Downs, did have a higher priority species richness than the average for England and a larger average area of agricultural land per square kilometre than the average for England. However, overall trends suggest that larger extents of agricultural land are associated with lower biodiversity values for both priority habitat and priority species. Nonetheless, upon examining the NIA objectives, nine NIAs had projects to increase the area of more-sustainable agricultural production. As discussed previously, several NIAs, namely Nene Valley, Dearne Valley and Marlborough Downs (NIAs from Management Groups 2 or 3), all have large areas identified as arable and horticultural or improved grassland land use, 76%, 57% and 100% respectively. Marlborough Downs in particular is an interesting NIA given its management and biophysical context; it overlaps heavily with a landscape designation but does not include the landscape management body in its partnership, which was a new partnership. It is run by farmers focused on their land, thus the 100% arable and horticultural land classification noted above. It should be noted that land described as arable and horticultural or improved grassland use does not necessarily mean it is used exclusively for agricultural purposes nor does it exclude all types of priority habitat or priority species but, in general, it does present a conflicting land use to those areas prioritised for conservation purposes at a landscape scale. Thus, NIAs with larger areas of agricultural land, namely those in Management Groups 2 or 3, are likely to experience trade-offs at a landscape scale between agriculture and biodiversity conservation, water quality and flood management.
Carbon storage

Five NIAs had values above the averages for England for both biodiversity indicators as well as for carbon storage. They are Humberhead Levels, South Downs, Wild Purbeck, Morecambe Bay and Dark Peak; four of these NIAs are from Management Group 1 and one from Management Group 2. Of these NIAs, Dark Peak, Humberhead Levels and Morecambe Bay all had projects aimed at improving carbon storage and sequestration. Meres and Mosses and Marlborough Downs had values above the average for England for priority species richness and carbon storage (although not for priority habitat). Meres and Mosses also had projects focused on improving carbon storage and sequestration. Northern Devon had higher than average carbon storage but lower averages than those for England for both biodiversity indicators. Both Meres and Mosses and Northern Devon are low in urban / suburban areas although both have large areas identified as arable and horticultural or improved grassland land use, 96% and 76% respectively, which could theoretically impact carbon storage as agriculture can release significant amount of carbon (Smith et al, 2007). The priority habitat types they do contain, however, have been identified as effective in carbon storage (Alonso et al, 2012); Deciduous woodland and Lowland raised bog constitute 76% of the priority habitat in Meres and Mosses while Deciduous woodland and Purple moor grass and rush pastures form 94% of the priority habitat in Northern Devon. Interestingly, Dearne Valley also had a project focussing on carbon storage and sequestration, although it was not a primary objective. However, it scores below the average for that of England in carbon storage. This is likely impacted by the fact that its predominant land uses are agricultural and built-up. However, it is possible to mitigate greenhouse gas emission in agriculture through sustainable land management practices (Smith et al, 2007) so there is the potential for Dearne Valley to improve its carbon storage although this could be challenging at a landscape scale.

Essentially, what emerges is that NIAs which have a larger area of priority habitat for their sizes, that is predominantly NIAs in Management Group 1, are also above average for carbon storage. NIAs in Management Groups 2 and 3 vary more; those with larger areas of certain types of agricultural land might have somewhat high levels of carbon storage, for example in grazing land. However, those NIAs with larger urban / suburban areas, one NIA in Management Group 2 and two in Management Group 3, have very low carbon storage.
Recreation

All twelve NIAs had projects relating to recreation. Four NIAs do have averages above that of England for both priority habitat and recreation indicators, namely South Downs, Wild Purbeck, Greater Thames Marshes and Dark Peak and six (those four already named plus Birmingham and the Black Country and Nene Valley) have averages above that of England for both priority species and recreation indicators. Dark Peak is unusual as it is the only NIA not to have any urban or suburban land use in it, thus potentially resulting in more limited access although it is relatively close to urban centres. There is one NIA, however, that is significantly higher than the average for England for the recreation indicator and that is Birmingham and the Black Country. As previously mentioned, the BBC NIA has an extremely large area identified as urban or suburban land use, 85% of its total area, and an extraordinarily high number of annual visitors, both overall and for its size. It is located near a large urban centre and is probably easily accessed which likely contributes to the high visitor numbers, as evidenced by the strong correlation between recreation and urban spaces for the landscape areas in Appendix VI. Dearne Valley also had a higher than the average for England value for recreation, likely for similar reasons to BBC NIA. The rest of the NIAs had values below the average for England for recreation. While recreation provides a variety of important services and potentially brings money to an area, it should be remembered that it can also put stress on certain ecosystems.

Including urban / suburban spaces within NIAs can enable recreation by facilitating access. Some NIAs, namely those in Management Groups 2 and 3 with largely informal or new partnerships, did include larger areas of urban / suburban land use. However, this has implications for potential synergies and trade-offs.

Water Quality

Eight NIAs had projects designed to address water quality: Birmingham and the Black Country, Dark Peak, Dearne Valley, Greater Thames Marshes, Nene Valley, Northern Devon, South Downs and Wild Purbeck. However, only three NIAs with biodiversity values above the averages for England also have values below the average for England for NO3 concentration (that is, the water quality is better in them). Those NIAs are Dark Peak, Morecambe Bay and Wild Purbeck, all NIAs in Management Group 1. All three have smaller areas of agriculture and urban / suburban spaces which likely contribute to the lower NO3 concentrations. Conversely, NIAs with more agricultural land or more urban / suburban spaces, predominantly those NIAs in
Management Groups 2 and 3, would likely be higher in NO3 than those areas which are more rural and lower in agricultural land use and indeed, the three NIA's with the worst water quality, Birmingham and the Black Country, Dearne Valley and Humberhead Levels, all have large areas of urban / suburban or agricultural land uses.

Flood management

The recorded flood outlines indicator provides a measure of the extent and location of areas that have flooded in the past and thus which are likely to do so again. Indeed, the results of this indicator are almost exactly the same with regard to NIA's as the results for the flood zones indicator which highlights areas at risk of flooding in the future which is not unexpected as they rely on some of the same data. Areas prone to flooding might benefit from natural spaces to mitigate flooding and flood damage. Areas that have more natural spaces likely benefit from protection from flooding or at least reduced flooding but there is no significant correlation, positive or negative, between either of the biodiversity indicators and recorded flood outline indicator as it is likely more dependent upon location than strictly the amount of natural area.

Three NIA's have values above the average for England for both biodiversity indicators and the flood extent indicators, meaning they have large areas are at risk of flooding; they are Greater Thames Marshes, Morecambe Bay and Humberhead Levels. However, only Humberhead Levels included a project specifically intended to address flooding. Flood management was also a focus for five other NIA's: Birmingham and the Black Country, Dark Peak, Dearne Valley, Nene Valley and Northern Devon. Even though an area might not have a greater extent of area known to have flooded in the past or likely to flood again in the future than the average for England, it does not necessarily follow that localised flooding is not an issue. Thus, this likely explains the disparity between NIA's with large areas known to have flooded and those with projects designed to address flooding. However, as Humberhead Levels has both a known flood risk and prioritised flood management, it is examined in more detail. Approximately 30% of priority habitat in Humberhead Levels NIA overlaps with the existing flood outlines. This priority habitat, close to 50% of which is either Coastal floodplain or grazing marsh or Lowland raised bog, could potentially help with water storage and thus flood mitigation (UK BAP Priority Habitat Descriptions, 2016).
As discussed, there are two aspects to flooding considered here; areas likely to flood, as just examined, and areas that are particularly vulnerable to flooding events discussed next. Three NIAs have areas that are considered to be particularly vulnerable to flood events because of the infrastructure they contain: South Downs, Greater Thames Marshes and Birmingham and the Black Country. Of these three areas, only the Greater Thames Marshes had a large area, approximately 115 square kilometres, where floods had been known to occur; both the South Downs and Birmingham and the Black Country had very small areas, 1.4 and less than 0.1 square kilometres respectively. Both South Downs and the Greater Thames Marshes have larger than average areas of priority habitat for England and have much smaller areas which are vulnerable to flood events, 19 square kilometres and 40 square kilometres respectively as compared to 564 square kilometres for Birmingham and the Black Country. South Downs has 4 square kilometres of priority habitat that overlaps with flood risk areas or about 4% of the priority habitat, Greater Thames Marshes 16 square kilometres or about 9% of the priority habitat in it and Birmingham and the Black Country 29 square kilometres or about 78% of the priority habitat within it. Priority habitat creation or restoration would likely assist in all cases but given that these areas are, by definition, vulnerable urban areas, it would likely be difficult given the conflicting land uses of urban development and land for conservation purposes.

What emerges, then, is that NIAs with larger agricultural or urban / suburban areas, those predominantly in Management Groups 2 or 3, might potentially have more challenges around managing flooding; they have less priority habitat for their size to help with water storage, potentially vulnerable urban areas and potentially conflicting land uses.

The results from these analyses of potential synergies and trade-offs between biodiversity conservation and ecosystem service delivery are brought together in Figure 5.15 which demonstrates relative differences between different NIAs. It should be noted that these are potential synergies and trade-offs at a landscape scale, not at more local scales.
Figure 5.15 A figure showing the number of potential synergistic opportunities between biodiversity conservation and the delivery of certain ecosystem services in the individual NIAs at a landscape scale.

<table>
<thead>
<tr>
<th># of potential win-win opportunities</th>
<th>Birmingham and the Black Country</th>
<th>Deane Valley</th>
<th>Marlborough Downs</th>
<th>Northern Devon</th>
<th>Greater Thames Marshes</th>
<th>Morcambe Bay</th>
<th>Dark Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Meres and Mossess</td>
<td>Humberhead Levels</td>
<td>South Downs</td>
<td>Wild Purbeck</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Nene Valley</td>
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</tbody>
</table>

Source: Author’s creation based on data from the assessed potential synergies and trade-offs between biodiversity and selected ecosystem service indicators.

Ultimately, what is apparent that different NIAs embody different potential synergies but also trade-offs. In general, NIAs in Management Group 1 tend to embody more potentially synergistic opportunities while those in Management Group 3 tend to result in more potential trade-offs. Some NIAs, in Management Groups 2 or 3, do extend into urban centres as per the objectives but having larger urban / suburban spaces will likely result in trade-offs with areas prioritised for conservation as well as other ecosystem services. There are some opportunities for win-win scenarios between biodiversity conservation and ecosystem service delivery; whether these have the potential to be “exploited to the full” (NIA 1, p 5) as per the objectives varies depending upon the individual NIA. At one end of the scale, there are four NIAs which might embody several potential synergistic or win-win opportunities between biodiversity conservation and certain ecosystem services, namely carbon storage, recreation, flood mitigation and water quality. These four areas, Dark Peak, Morecambe Bay, South Downs and Wild Purbeck, also all happen to be areas which fall into the Management Group 1 typology. At the other end of the scale are two areas which suggest fewer synergistic opportunities and several potential trade-offs between biodiversity conservation and certain ecosystem services, namely agricultural and urban / suburban land use, one from Management Group 2 and one from Management Group 3. Management at a local scale could mitigate some of these trade-offs but likely not all.
5.6 Conclusions:

This chapter offers a detailed examination of the implementation of the NIA Initiative and explores the impact of those implementation choices on the capacity of the Initiative to achieve its stated goals, particularly with regard to the dual mandate for both benefits for people and wild nature. It employs both quantitative and qualitative analyses as well as data triangulation to study all aspects of the NIA Initiative and understand the impact of the design and implementation on the eventual outcomes of the program.

Finding 1: The timeline for the design and implementation of the NIA initiative was very short which had impacts on the partnerships able to apply for the competition process, the stakeholders included, the objectives and targets of the individual NIAs and the design and implementation of the monitoring system, all of which ultimately limited the measurable outcomes of the Initiative.

The NIA Initiative was designed and implemented over approximately four years, from the middle of 2011 through to the middle of 2015. This was an incredibly short time period in which to stage a competition, develop robust management plans, design a monitoring system and achieve measurable outcomes. Areas with existing partnerships were better placed to make bids for the competition but the period was so short that even the advantages of an existing partnership did not help advance the implementation significantly in individual areas. Furthermore, the short timescale meant that NIAs developed plans largely based on existing work, which was ultimately, despite the best intentions, far more focused on biodiversity conservation goals as opposed to ecosystem service delivery goals. The monitoring system, rushed and heavily dependent on existing, predominantly national data sets, also emphasised biodiversity conservation over ecosystem service delivery. Those services that are measured are poorly framed and based on indicators that mostly examine the potential contribution of habitats to the delivery of those services rather than actually measuring the services themselves. The poorly framed indicators and short time-period in turn limited the measurable outcomes of the Initiative. Ultimately, the short timescale had severe impacts on the scope of the NIA Initiative and hampered its progress from the very beginning, particularly with regard to the dual mandate of benefits for both people and wild nature.
Finding 2: There is far more emphasis on improving biodiversity conservation than on increasing ecosystem service delivery or community engagement as evidenced by the type and clarity of the objectives and targets chosen by the individual NIAs as well as the indicators utilised by the monitoring system of the NIA Initiative.

Upon examining the objectives and targets of the individual NIAs and examining their emphases, whether biodiversity conservation-focused or ecosystem service delivery-focused, it is clear that there are far more objectives that seek to improve biodiversity conservation, 41, than those which seek to improve the delivery of certain ecosystem services, 29, although the break-down varies according to the individual NIA. Though some of the NIAs did frame their approaches with emphasis on benefits for people, the clarity of the biodiversity objectives was far better than that of the ecosystem service objectives or community engagement objectives. For example, only four NIA actually identified priority ecosystem services in their objectives and one NIA did not mention the phrase ‘ecosystem service’ in their business plan at all.

This emphasis on biodiversity conservation over ecosystem service delivery and community engagement in the Initiative is furthered by the indicators used in the monitoring system of the NIA Initiative. Although there are themes for both biodiversity conservation and ecosystem service delivery, upon closer examination, the indicators for ecosystem service delivery are overwhelmingly habitat based, measuring the area of a certain habitat that might contribute to the provision of a service instead of actually measuring the service itself. In the case of social indicators, they focus on specific, likely already active in conservation, community groups. Thus, it is impossible to identify any change in provision of an ecosystem service or social engagement though any measurable change is unlikely regardless given that the program ran for only three years. The biodiversity indicators are better but still measure only basic aspects of biodiversity, namely the change in extent of habitats of conservation concern and counts of certain focal, largely charismatic species. The monitoring system was hampered by limited data availability and the problem of monitoring diverse areas at multiple scales, both local and national. When the number of indicators reported is assessed, NIAs focused far more on biodiversity indicators, reporting 56% of all possible biodiversity indicators and only 41% of the possible ecosystem service indicators in Year 3, a trend which is seen in all three years.
Finding 3: NIAs offer, in general, poor to moderate buffering potential of core sites at a landscape scale but could make moderate contributions to the connectivity of England’s ecological network by facilitating coordinated habitat creation and restoration, particularly in areas where there are holes in the existing ecological network of landscape designations.

The proportions of the three types of land use considered (priority habitat, agricultural and built-up) are sufficiently different between the core areas within the NIAs and the NIAs themselves that no significant results were obtained through the use of the chi-square statistical test which assessed for similarities in land use proportions; in other words, priority habitat within core areas is generally surrounded by agricultural or urban land uses within the rest of the NIAs. While this does not necessarily mean that there is no potential for the NIAs to provide suitable buffers for the core areas, which is a key objective of the NIA Initiative, it does indicate a reasonable and potentially conflicting variation in land use. The proportion of the three types of land use in the 1-kilometre zones outside the NIAs was also sufficiently different to the land within the NIAs that no significant results were obtained for that analysis either. Ultimately, NIAs which have large areas of agricultural or built-up land use, largely those in Management Groups 2 or 3, are less likely to be able to provide suitable buffer zones, although this depends upon certain factors such as the type of agriculture and the land management strategies.

The NIAs do have the potential to be able to contribute moderately to the connectivity of England’s ecological network however, another key objective of the NIA Initiative, although this varies between individual NIAs. What the NIAs do specifically provide is landscape-scale approach and coverage in some areas not traditionally included in the existing ecological network of landscape designations, particularly more built-up areas as emphasised in the overall NIA objectives. This presents a trade-off, however; areas which extend into built-up spaces can help provide increased coherence and resilience in the existing ecological network by facilitating the restoration of smaller, core areas as well as foster improved delivery of some ecosystem services, like access and recreation. However, the natural qualities of some sites might be compromised by the areas of built-up land use nearby. Furthermore, areas of significantly built-up land uses will also potentially compromise the buffering of the core areas as well as a result of competing land uses and limit the potential win-wins for both wild nature conservation and ecosystem service delivery.
Finding 4: Assessment of landscape designations in England illustrates likely synergies and trade-offs between biodiversity conservation and the delivery of some ecosystem services but it also highlights potential challenges for some NIAs in achieving the dual mandate of benefits for both people and wildlife on a landscape scale.

Some NIAs, largely those in Management Group 1, have the potential for win-win scenarios for both biodiversity conservation and the delivery of several ecosystem services, a key objective of the Initiative, but some NIAs, predominantly NIAs with large areas of agricultural or urban land use, such as those in Management Groups 2 and 3, are have fewer potential win-win scenarios and more potential trade-offs. Win-win scenarios are likely between biodiversity conservation and carbon storage, recreation, water quality and the prevention of flooding while trade-offs are likely between biodiversity conservation and agriculture as well as areas with a large extent of urban or suburban land use. Even though an NIA might not necessarily be likely to have many win-win opportunities for both biodiversity and service delivery at a landscape scale, there may be potential at different scales. However, local-scale win-wins might still not necessarily provide the potential for the opportunities to be “exploited to the full” as sought by the NIA objectives (NIA 1, p 5).
6 Outputs and outcomes of the NIAs: did the Initiative achieve what it intended to?

This chapter examines the outputs and outcomes of the NIA Initiative; these were explored through the semi-structured interviews and primary documentation of the NIAs (Table 3.2), examining not only those projects deemed successful or otherwise by the managers of the NIAs but also the presentation of their outputs and outcomes, how projects are discussed and what language is used to describe them. It essentially explores what elements of the NIA Initiative were not only stated but actually prioritised for action at the local level. It first explores the assessed outputs and outcomes reported by the Final Monitoring and Evaluation Report (CEP, 2015a), examining the national interpretation of the achievements of the Initiative, then compares, where possible, that with the assessment done for this thesis which focuses more on the local level. However, this chapter takes the analysis one step further than the Final Monitoring and Evaluation Report (CEP, 2015a) as it is not only interested in the ‘what’ but the ‘why’ of the outputs and outcomes; what contributed to the results that were, or were not, achieved? This work is primarily concerned with outcomes, that is the longer-term, broader achievements of the NIA Initiative, rather than the outputs, as the shorter term, measurable outputs are limited by the lack of quality data.

This chapter addresses research question three: **What are the key achievements and drawbacks of the NIA initiative both locally and nationally and what insight does this provide with regard to the multiple objectives of the Initiative at both local and landscape scales from a management context?** There are some key gaps in the Final Monitoring and Evaluation Report (CEP, 2015a), namely an examination of the various forms of collaboration, the impact of national leadership, or any exploration of behavioural change in the NIAs and their local communities, particularly as this is a key feature of the ‘step-change’ as envisioned by Lawton et al (2010), as well as the assessment of why certain outcomes were or were not achieved. By critically examining the outputs and outcomes of the individual NIAs, including evaluating those reported by the Final Monitoring and Evaluation Report (CEP, 2015a), this chapter aims to provide insight into the progress of the NIA Initiative in achieving the step-change and contributes to scientific knowledge and political nature of the outcomes of the NIA Initiative in England.

The outcomes are discussed in the order in which they are presented in the Final Monitoring and Evaluation Report (CEP, 2015a) which is as follows:
- biodiversity and ecosystem service outcomes;
- social and economic outcomes, which are here considered under the broader term of community engagement, a term used interchangeably with the sub-theme ‘Social and Economic’ throughout the Final Monitoring and Evaluation Report (CEP, 2015a, p 31) although they are not entirely equivalent;
- collaboration, including within the partnerships, within the NIA Initiative and between the NIA Initiative and other programs; and, lastly,
- national leadership.

This is then summed up with an assessment of behavioural change within the individual NIAs and whether the Initiative, as a whole, has made progress towards the step change envisioned by Lawton et al (Lawton et al, 2010).

The organisation of the chapter is as follows:

Section 6.1 examines the biodiversity and ecosystem service outcomes of the NIA Initiative, first as presented in the Final Monitoring and Evaluation Report (CEP, 2015a), then as determined by this work. It particularly examines the delivery priorities of the individual NIAs and the resulting impact on the outcomes. It ends with an examination of the outcomes given the difficulties with the monitoring system as discussed in Section 5.4.

Section 6.2 explores the Social and Economic outcomes with particular emphasis on the social outcomes and the overall community engagement of the NIA Initiative. It specifically focuses on the penetration of the NIA concept into the wider communities of the individual areas. It then examines the understanding of the NIA brand in the local communities and the impact of management context on the use of the NIA title by the different NIAs.

Section 6.3 endeavours to understand the NIA approach to and outcomes of collaboration across scales; that includes collaboration within individual NIAs, collaboration between different NIAs and collaboration with programs outside of the NIA Initiative.

Section 6.4 investigates the perceptions of the impact of national leadership on the outcomes of the NIA Initiative.

Section 6.5 brings together the outcomes of the other sections in Chapter 6 along with understanding of the implementation of the program from Chapter 5 to explore the progress in achieving behavioural change in the NIAs and the contribution of the NIAs to the ideal step-change as envisioned by Lawton et al (2010).

Section 6.6 concludes the chapter with an overview of the key findings.
6.1 Biodiversity and ecosystem service outcomes…were they inevitable?

The Final Monitoring and Evaluation Report (CEP, 2015a) examined the biodiversity conservation and ecosystem service delivery outputs and outcomes in three separate ways. The first approach was developed as a ‘counterfactual scenario’ (CEP, 2015b) which is intended to explore what would have happened in the absence of the NIAs and thus understand the difference the Initiative has made. This approach employed semi-structured telephone interviews with seven national stakeholders as well as all 12 NIA partnership chairs and an online survey of the NIA partners completed by 122 people to implement the assessment based on "selected outcomes and impacts of the NIA initiative" (CEP, 2015a, p iii). Approaches two and three were more experimental and specifically intended to test “whether comparative data on uptake of environmental stewardship options could provide the basis for assessing the difference landscape scale conservation interventions (such as the NIA initiative) have in a particular area” (CEP, 2015a, p xv). However, the results from approach one ultimately provided much of the data used in the conclusions as approaches two and three suggest no clear patterns or statistically significant results. The outputs and outcomes were also bolstered by data from the Monitoring System; however, in many cases data were insufficient and so outcomes were based largely on the counterfactual assessment. The results from the Final Monitoring and Evaluation Report (CEP, 2015a) are presented in a top-down approach; the general conclusions of the work are presented first, then the responses to the questions from the survey which included participants involved in all aspects of the NIA Initiative, followed by a self-assessment of objectives achieved done by the NIAs themselves.

The Final Monitoring and Evaluation Report (CEP, 2015a) championed a number of outputs derived from its analysis of the data reported through the NIA Monitoring System (CEP, 2014c) assessing biodiversity conservation. What the Final Monitoring and Evaluation Report (CEP, 2015a) found was that all NIAs delivered actions to enhance biodiversity conservation, providing the following statistics:

- “14.6% - Proportion of existing priority habitat in NIAs subject to new management action
- 13,664ha - Area of existing priority habitat in NIAs managed to maintain or improve its condition
- 4,625ha - Area managed to restore or create new priority habitat in NIAs” (CEP, 2015a, p x).
When discussing the ecosystem service outputs, the following statement was made: “Some NIAs delivered actions specifically designed to enhance ecosystem services, such as flood protection (e.g. through watercourse maintenance) and carbon sequestration. Reflecting the integrated approach, all NIA activities related to enhancing or creating habitats or encouraging local people to engage with the natural environment, will have also enhanced ecosystem services” (CEP, 2015a, p xi). Essentially, there were inadequate data available to quantify NIA contributions to ecosystem service delivery and thus the decision was made to report the assumption that improvements made to the natural environment will also have resulted in the improved delivery of ecosystem services. In conversation with members of the public bodies overseeing the Initiative, this was suggested as necessary given the comparatively early stages of ecosystem services monitoring.

There are any number of problems with the assumption that improvements in wild nature conservation will also provide improved ecosystem service delivery. While prioritising nature conservation will also safeguard the delivery of some services in some locations, this is not true in every case. For example, while biodiversity is generally positively associated with the ecosystem services of carbon storage or sequestration (Thomas et al, 2012; Reside et al, 2017), the association is geographically variable (Strassburg et al, 2010), and even reverses in some regions (Anderson et al, 2009). More generally, while restoration is sometimes positive for both biodiversity conservation and the delivery of certain ecosystem services, Bullock et al (2011) demonstrate that conflicts might still occur, particularly if one specific ecosystem service is prioritised and, what is more, the system might never achieve the original natural state, even over long periods. Ricketts et al (2016), having conducted a review of the evidence, also found what they term “varying dynamics relating biodiversity to ES,” (p 1) which, they emphasise, illustrates the importance of directing management efforts by employing the most relevant scientific evidence. Furthermore, there are potential synergies and trade-offs, not only between biodiversity conservation and ecosystem service delivery but also between different ecosystem services as discussed in Section 4.1. Indeed, when drilling down into the data of the NIA Initiative, it is clear that opinions varied on ecosystem service outputs.
The questions regarding the biodiversity conservation and ecosystem service delivery outputs used in the interviews and surveys were as follows:

“To What extent have NIAs contributed to…
  o Improved, restored or created habitats?
  o Improved species status?
  o Improved connectivity?” (NIA IX, p 144).

“To what extent have NIAs contributed to…
  o Improved cultural services?
  o Improved supporting services?
  o Improved regulating services?
  o Improved provisioning services?” (CEP, 2015a, p 144).

The questions regarding the contributions of the NIAs to biodiversity conservation resulted in the following assessment in the Final Monitoring and Evaluation Report (NIA IX): “The majority of respondents considered that biodiversity benefits had been delivered over and above what would have happened anyway,” (CEP, 2015a, p 116).

In contrast, the questions regarding the contributions of the NIAs to ecosystem service delivery resulted in the following assessment in the Final Monitoring and Evaluation Report (CEP, 2015a): the analysis found “Significant variation in responses about the extent that the NIA initiative has led to additional ecosystem service outcomes across NIAs depending on objectives and nature of NIAs,” (CEP, 2015a, p 116). Furthermore, while National Stakeholders found “that the NIAs raised the profile of ecosystem services” (CEP, 2015a, p 116), only a few of respondents felt that certain ecosystem services had provided win-win opportunities for both wild nature and service delivery: “some felt that improved coordination between Water Framework Directive (WFD) and biodiversity activities was achieved,” (CEP, 2015a, p 116).

Cultural services were also mentioned as a likely win-win situation as demonstrated by the following statement: “Reflecting the integrated approach, all NIA activities related to enhancing or creating habitats or encouraging local people to engage with the natural environment, will have also enhanced ecosystem services,” (CEP, 2015a, p xi). Although the statement does not directly use the phrase cultural services, it is clearly implied by the reference to encouraging locals to ‘engage’ with nature. However, it must be noted that this assessment is based on an assumption and not actual data. Clearly, though, ecosystem service delivery was not considered to be as successful in terms of desired outcomes as biodiversity conservation was perceived
to be and only a few ecosystem services are actually identified as having been win-win opportunities, namely water management and recreation.

The NIAs provided a self-assessment of progress against their original objectives which was reported in the Final Monitoring and Evaluation Report (CEP, 2015a) and which is reproduced here in Figure 6.1. It is clear from this figure that the biodiversity objectives were achieved far more than the ecosystem service objectives or even the community engagement (detailed under the Social & Economic theme) or the partnership objectives under the Process theme. 68% of biodiversity objectives were achieved on average for all categories as compared to only 46% of all ecosystem service objectives, 55% of Social & Economic objectives and 62% of Process objectives. The report indicates that all objectives achieved satisfactory progress, but it does not provide an explanation of what ‘satisfactory progress’ actually means.

Figure 6.1 A self-assessment of progress towards partnership objectives reproduced from the Final Monitoring and Evaluation Report (CEP, 2015a, p 155).

Notes: The self-assessment is based on data collected in the 4th quarterly progress reports of the final year (CEP, 2015a).
For this work, the following question was asked to determine how NIAs perceived their biodiversity and ecosystem service outcomes: “What are your thoughts on the progress made so far?”. The question was intended to be general so as to allow the managers to provide their own, independent perceptions of their outcomes, to explore which projects were emphasised, and successful and which projects were not prioritised or perhaps did not work as well. What emerges is that far more NIAs emphasised biodiversity outcomes over ecosystem service outcomes, nine in fact as seen in Table 6.1.
Table 6.1 Biodiversity and ecosystem service outcomes as described by representatives of the individual NIAs during the semi-structured interviews.

<table>
<thead>
<tr>
<th>NIA</th>
<th>Biodiversity outcomes</th>
<th>Ecosystem service outcomes</th>
<th>Emphasis</th>
<th>Evidence</th>
</tr>
</thead>
</table>
| Dark Peak                          | Habitat/species                         | Water quality               | Biodiversity              | "There's lots of enthusiasm for doing stuff in the Peak District, but I guess the point is that we're just about practical delivery."
| Morecambe Bay                      | Habitat, connectivity                   | Community engagement        | Biodiversity              | "We're mostly focused on habitat enhancement, priority habitat enhancement. Part of one strand of the project was looking at rivers and looking at water quality, so looking at where riverside planting of woodland and woodland management alongside river banks could help enhance water quality. We worked with the South Cumbria Rivers Trust on that particular project. That was probably the best example of that. Actually, there was another one at Park End Farm. We did a large scale wetland creation project there and that linked in very closely with the wider land management of that area of farming and also the visitor potential there as well."
| South Downs                        | Habitat                                 | Groundwater quality         | Biodiversity              | "There were five objectives within the NIA programme. The first two are chalk grassland, 'walking the chalk' and 'linking the fragments'. Our work on chalk grassland is continuous, it's ongoing... So I think what the NIA has done is raise the profile of the chalk grassland habitat and just given it that kick start, you know, and we will continue that NIA philosophy. One of the other key objectives, which we will continue working on, is the water objective, 'surface to groundwater'. As I'm sure you're aware, the chalk of the national park is a huge aquifer, and we're talking about, through restoring areas of downland, not necessarily back to chalk grassland, but can you improve water quality?" |
| Wild Purbeck                       | Habitat                                 | Community engagement        | Mixed                     | "I think it is quite difficult to say what would have happened if we hadn't got the money. Certainly, a lot of the restoration stuff wouldn't have happened and we wouldn't have done the community work. There's a lot of stuff we wouldn't have got done, basically. I think it has been really good."
| Deane Valley                       | Habitat, species                        | Community engagement        | Biodiversity              | "We managed to force through some kind of acquisitions...that worked terrifically well. As I say, there's lots of enthusiasm for doing stuff in the Peak District, but I guess the point is that we're just about practical delivery."
| Marston Vale                       | Habitat, species                        | Biomass fuel, recreation, water quality | Biodiversity              | "The core of it all has always been the inner Humber and the Humberhead Levels Peatland NNR... There was a lot of work that can be, and is continuing to be, done there... That was successful in the sense of what we delivered and, also, how we were able to get extra funding in to do the delivery. But, also, there is so much to do, and that takes so long, that actually it's also a massive challenge. One restoration we won't know about for a couple of decades..."
| Humberhead Levels                  | Habitat, species                        | Community engagement        | Biodiversity              | "As an NIA, we haven't done that much work on the key sites. Most of the work we've done has been to protect the key sites by improving water quality, by trying to ensure more appropriate access, and that kind of thing."
| Mere and Mosses                    | Buffer zone                             | Agriculture, community engagement, recreation, water quality, flooding | Mixed                     | "I think we have done very well so far. I'm very proud, particularly, of the actual results that we managed to deliver working with landowners and with communities as well. Inevitably with all of these projects we're looking for actual outcomes on the ground as well as commitments in principle."
| Northern Devon                     | Habitat                                 | Community engagement        | Mixed                     | "There wasn't a huge amount of, a significant amount of habitat restoration and creation work going on [before], and it very much changed the direction of our organisation and of the partnership to become much more delivery-focused and much more proactive."
| Birmingham and the Black Country   | Habitat                                 | Community engagement        | Biodiversity              | "There was a huge amount of, a significant amount of habitat restoration and creation work going on [before], and it very much changed the direction of our organisation and of the partnership to become much more delivery-focused and much more proactive."
| Greater Thames Marshes             | Habitat, species                        | Community engagement        | Biodiversity              | "The other one that we wanted to promote in Essex was habitats and assemblages of species called the Thames Terraces Invertebrates... So we had a scheme to enhance those sites so to improve the habitat of these things. That was actually really successful. It became, for us, it's very much the Thames, so in terms of the NIA that was really... There was a priority about communication... so we had an element in the business plan which was called Nature Watch Points... Part of me feels that it's such a huge area that there were little pinpoints of community activity. We couldn't ever claim that anyone knew that the NIA existed really because we couldn't influence that massive population."
| Marlborough Downs                  | Habitat, species                        | Community engagement        | Mixed                     | "You can't target every bird. We just targeted two birds. The tree sparrow. You've never heard of a tree sparrow. But a tree sparrow is unique to this part of the world... and there are very, very, very few of them. Probably no more than 500 pairs... Yes, we achieved a lot. We achieved the target... We tried to get people on the farm... We've done the dew ponds, so that's done."
| Isle of Wight                      | Habitat                                 | Agriculture, community engagement | Mixed                     | "We had our objectives... we had a planning and development objective... that had just a focus on planning policy, planning applications, anything within the NIA and trying to get it into policy and also influence some of the big developments... we had one around access which was a study on basically visitor pressure, visitor numbers, visitor activity across the whole NIA. The SPA, which is also at the heart of the whole thing, its main issue is disturbance and visitor pressure, so the idea was to actually get the baseline of where people are and where that pressure is actually happening. Then we had river restoration, we had a river restoration officer who... came up with projects that could be implemented to restore sections of the river. We had a land management objective, so we... worked with the landowners, and identify farms [to get] into high level stewardship... Then we also had a fund for meadow restoration and meadow creation. Then ecosystem services was our fifth objective."

Notes: NIAs were asked: "What are your thoughts on the progress made so far?".

This includes four NIAs who had emphasised both biodiversity and ecosystem service objectives as discussed in Section 5.3 and illustrated in Table 5.2. Those NIAs are Morecambe Bay, South Downs, Humberhead Levels and Birmingham and the Black Country.
Country. One NIA will be explored further as an example of this shift: South Downs NIA.

The South Downs NIA had five objectives which were as follows:

- “To broaden the South Downs Way (SDW) National Trail as a semi-natural corridor and improve the natural qualities of the route
- To achieve real improvements to the conservation and management of chalk grassland at the heart of the matrix of downland habitats.
- To demonstrate the viability and benefits of an input-based approach to the improvement of groundwater quality.
- To assess and demonstrate the benefits of ecosystem services to urban populations
- To attribute an environmental, economic and social value to the benefits and services provided by chalk downland” (SD BP, p 25).

These objectives clearly include both biodiversity conservation and ecosystem service delivery targets. However, when discussing the targets in the interview, the respondent(s) plainly identified the first three objectives as the primary focus for delivery outputs, as evidenced by the quote shown in Table 6.1 and emphasised that the main goal in each case was chalk grassland restoration. The benefits derived from that restoration, including certain ecosystem services such as groundwater quality, were a secondary consideration. A prime example of this is demonstrated by a South Downs presentation titled “Ecosystems Services – Achievements 2012 and 2013” at the Best Practice Network Event 3; the event was held to discuss ecosystem services but, in the presentation, the focus is on the conservation of the Duke of Burgundy butterfly. Indeed, the aims of the project, presented here, are stated as “Improve, extend, create and link chalk grassland habitat suitable for the endangered Duke of Burgundy butterfly,” (SD BPNE, 2013 in NIA 3). The ecosystem service benefits are brought in at the end as a clearly secondary consideration (SD BPNE, 2013 in NIA 3). In other words, the emphasis was largely on habitat and species restoration and conservation, not ecosystem service delivery, as noted in some conversations with people working at the national level with regard to NIA approaches to multiple objectives. The respondent(s) sum it up this way: “I think it’s fair to say that you have to pick what your priorities are. For us, it was very much making a difference on the ground, putting as much of the resource, the money, you know, potential money we would get, into the ground…You know, you have to pick your priorities because it wasn’t a bottomless pot of money. So, our key drive was always restoration of chalk grassland,” (Interview).
In contrast, however, one NIA actually emphasised ecosystem service outputs despite having not emphasised ecosystem service objectives in their business plan: Marlborough Downs. Marlborough Downs discussed access and community engagement as some of their most successful outputs and outcomes although they achieved their stated biodiversity objectives as well and were pleased with the progress made with regard to those targets: “the greatest success…was Open Farm Sunday. We hadn’t done it before, but because it was done by all of us… we’re carrying on with that, because we’re getting well over 1,000 people now,” (Interview).

This emphasis on biodiversity outcomes over ecosystem service outcomes is similar to certain trends noted in the design and implementation of the Monitoring System as discussed in Section 5.4. Does this suggest, then, that the achievement of a larger percentage of biodiversity outcomes was then inevitable as compared to ecosystem service outcomes? This work would argue that while the poor design of the NIA Monitoring System, particularly with regard to ecosystem service delivery indicators, certainly contributed to the lack of measurable outputs for ecosystem services in the Final Monitoring and Evaluation Report (CEP, 2015a), it was not inevitable that ecosystem service outcomes were not as successful as biodiversity outcomes. In fact, this work suggests that the wild nature focus derives from the original motivations of the NIAs as discussed in Section 4.5; they are, by and large, conservation organisations with an interest in the persistence of wild nature. The NIA business plans included ecosystem service objectives, as discussed in Section 5.3, because the NIA Guidance Notes (NIA 1) indicated that it was the way to successfully achieve NIA funding but that the primary focus for many NIAs were the biodiversity conservation objectives; the ecosystem service objectives were a secondary, ideally synergistic outcome. The poorly designed ecosystem service delivery indicators merely intensified the result.

However, there is perhaps slightly more to the potential bias within the NIAs at the local level against the ecosystem service concept. Despite being a primary feature of the national NIA objectives, many of the NIAs did not address ecosystem service delivery in the semi-structured interviews unless it was first mentioned by the interviewer, regardless of being asked a range of questions about priorities and successes / disappointments within the NIAs prior to the ecosystem service discussion, which always occurred at the end of the interview unless brought up by the respondents earlier. In contrast, all twelve discussed biodiversity or conservation objectives and successes / disappointments without prompting.
When NIAs did address the concept of ecosystem services of their own accord in interviews, which happened in three cases, it was more frequently to discuss the complexities of applying the concept. One NIA made the following statement: “I think ecosystem services is one of those things that biodiversity was 20 years ago. It is quite a turn-off in terms of a phrase, I think. I think it is another of those phrases that everybody understands slightly differently. We did have a meeting about ecosystems services…I came to the conclusion, this was probably at the beginning of the NIA two or three years ago. If you’ve got one service that is inherently obvious you can get some quite good things. It was water basically. If you want clean water, there’s a requirement for clean water and the water company finds it’s more expensive to pay for treatment works than to pay for good management, which will mean they don’t need to pay for the treatment works or the extra whatever. Then you can get PES system working when you get a payment, and somebody then does something which helps deliver. I think when they started talking about bundles of ecosystems and stuff…I’m not entirely convinced of it as being a way of easily describing and becoming popularly used at the moment. I think it’s got a long way to go before it’s going to be…it is quite a nice academic idea, but it’s really incredibly difficult to actually apply in a meaningful way I think,” (NIA xii). Another NIA also expressed hesitation over the concept: “Ecosystem services and… I guess, from that, sort of, ideas of natural capital value being bandied about here, there, in other words. I think, from my understanding, it was more of an international agenda really because it was all about trading in, you know, carbon credits and rainforest protection…Overall I don’t know how successful it’s been [locally here].” (NIA i). One NIA had a different perspective, suggesting the concept had been quite useful in their NIA, although not their primary focus: “I don’t think we are totally ecosystem service driven, but I think that in exploring how these things work in practice we are contributing a lot of data and a lot of knowledge to that debate and that’s brilliant. I find that really exciting,” (NIA viii). Ultimately, it is possible that some of the NIAs were less comfortable with the ecosystem service concept at a local level which had the potential to impact priorities and result in the emphasis on biodiversity outcomes over ecosystem service outcomes.

Some NIAs also discussed the difficulty of engaging the public with the ecosystem services concept in other forums, namely the Best Practice Networking Events. For example, South Downs mentioned that using the term ‘ecosystem services’ did not assist in helping the public understand the value of the natural environment (SD BPNE, 2013 in NIA 3). Birmingham and the Black Country also identified the
following, related problem in Best Practice Networking Event 4: “Even if people are aware of the range of ecosystem services they usually don’t know how important and valuable they are,” (BBC BPNE, 2014 in NIA 3).

The ecosystem services concept can be difficult to apply in practice as a result of complexities associated with the framing and monitoring of ecosystem goods and services (Potschin and Haines-Young, 2011; Mace et al, 2012), also addressed in Section 5.3. Portman (2013) identify two important steps regarding the application of the ecosystem services concept in practice in landscape-scale conservation, both of which highlight problems within the implementation of the NIA Initiative. First, it is necessary to develop “the knowledge and tools necessary to forecast and quantify the return from ES” in order “to aid professionals in explicitly and systematically integrating this knowledge into institutional frameworks,” (Portman, 2013, p 188). As previously discussed in Section 5.3, the monitoring tool was plagued with problems from the very beginning of the Initiative. The second key step is the development of methodological approaches which “can cross…landscape units and be incorporated in decision-making among multiple jurisdictions and at levels of government” (Portman, 2013, p 188). The second step is particularly necessary so that more local-scale efforts which benefit from being able to effectively engage local communities, such as the NIA Initiative, as yet “lack the purview to drive larger scale protection efforts or to manage ecosystem services in ways that incorporate multiple cumulative impacts that change as ecosystem types vary,” (Portman, 2013, p 188). It is possible that the complexity of applying the ecosystem service concept impacted the emphasis on biodiversity outputs and outcomes in the NIAs at the local level and this difficulty was then amplified by the inadequate monitoring system implemented at the national level.

6.2 Community engagement

Community engagement was a key part of the NIA Initiative which stemmed directly from Lawton’s original recommendations for the ERZs. Lawton et al (Lawton et al, 2010) saw community engagement as essential to achieving the desired step-change in nature conservation as demonstrated by the following quote:

“We will not achieve a step-change in nature conservation in England without society accepting that [it] is necessary, desirable, and achievable. This will
require strong leadership from government and a step-change in collaboration between local authorities, local communities, statutory agencies, the voluntary and private sectors, farmers, landowners and other land-managers and individual citizens. It will require education, explanation, and empowerment. It will also require resources, both money and people. It cannot be ‘top down’ and imposed. Nor can it be entirely laissez-faire. It won’t be easy. But it can be done,” (Lawton et al, 2010, p 69).

6.2.1 Community engagement in the NIAs

The results of the community engagement assessment in Final Monitoring and Evaluation Report (CEP, 2015a) are examined in this next section. The assessment was done through a series of questions exploring the contributions of the NIA Initiative to the physical and mental health of local people, the education and learning of local people, and the social development and connections of local people as well as the symbolic, spiritual and aesthetic benefits of the NIA. These questions essentially mirror the indicators in the “Social impacts & wellbeing” sub-section of the NIA Monitoring System presented in Table 5.3. There are no results that are derived from the monitoring system of the NIAs, likely as a result of inadequate data although this is not specifically stated. Thus, only the qualitative assessments are presented. It should also be noted that these categories of community engagement incorporate elements of cultural ecosystem services within the indicators but that community engagement, as envisioned by the Lawton Report (Lawton et al, 2010) is considered to be broader; it emphasised the empowerment of local people to alter their understanding of wild nature. However, ecosystem services were a key part of societal engagement and understanding. The Report (Lawton et al, 2010) states “There are many things that society has to do that may seem to have rather little to do with nature conservation, but could have, or even should have if we embrace more radical thinking.” (p 69), continuing on to identify ecosystem service provision as a clear example that could “deliver significant societal benefits, and a more effective ecological network” (Lawton et al, 2010, p 69).

The Final Monitoring and Evaluation report (CEP, 2015a) concludes that the NIA contributed to all aspects of community engagement, namely the physical and mental health, the education and learning, and the social development and connections of the local residents as well as to the spiritual and aesthetic benefits of the NIAs. However, a closer examination of the data provides a different picture. Only 11% of respondents (N = 122) in the Final Monitoring and Evaluation Report (CEP, 2015a)
felt that community engagement was much improved, as shown in Figure 6.2, although 49% felt that it was moderately enhanced.

Many of the conclusions are based on assumed benefits: “A range of NIA partnership activities were likely to have had physical and mental health benefits, including volunteering, improved access to and engagement in the natural environment, and projects specifically targeting improved health as an outcome,” (CEP, 2015a, p 97). Additionally, upon delving deeper into the NIAs’ responses to the questions, the report acknowledges that there was significant variation in the responses from different NIAs (CEP, 2015a). It should also be noted that merely hosting an activity does not necessarily guarantee success in promoting the type of engagement envisioned by Lawton et al (2010) and indeed, many events did have low visitor numbers (CEP, 2015d). It also becomes evident that, in some cases, few NIAs had or prioritised activities for all aspects of engagement. For example, when examining data on spiritual and aesthetic benefits, the Final Monitoring and Evaluation Report states that “NIA partnership activities explicitly considering these benefits sought to enhance the sense of place within NIAs as well as undertaking artistic enhancements / representations of local places,” (CEP, 2015a, p 97). However, only half actually clearly addressed such benefits in their objectives.

Furthermore, though social development and connections were considered to have been enhanced, it is clear this was mostly targeted towards specific community groups, namely volunteers; “The evidence provided by the NIA partnerships indicated that new networks had been developed or existing ones strengthened. This was mostly achieved through volunteering,” (CEP, 2015a, p 98). Furthermore, upon closer examination of the results, here too there is a caveat: “While NIA partnerships sought to engage with all social and economic groups, the available evidence was insufficient to understand if the diversity of people involved in and visiting the NIAs widened,” (CEP, 2015a, p 98). What these two statements indicate is a limited community involvement that largely centres around volunteering; the question then becomes whether the volunteers represent novel community engagement or not, further addressed in the research work of this thesis and presented shortly.

The analysis conducted for this thesis, in order to examine community engagement, asked the following question: “In what way is the larger community involved?” with the follow-up “What is the community-wide understanding of the NIA Initiative?”. Of the 12 NIAs, three reported successful and widespread community engagement, six reported some moderate community engagement and three reported very limited
wider community engagement. The NIAs reporting limited community engagement are addressed first. A graphical representation of these results as compared to those from the Final Monitoring and Evaluation Report (CEP, 2015a) can be seen in Figure 6.2. The numbers are broadly similar although the data collected in the course of this research shows a slightly higher percentage of respondents indicating that community engagement was much improved; the main reason for this is that the breakdown was by NIA (N = 12) instead of individual responses (N = 122), in other words broader units.

Figure 6.2 An assessment of the success of the community engagement activities of NIAs as reported by people engaged in the NIA Initiative; the data presented is a comparison of the results adapted from the Final Monitoring and Evaluation Report (CEP, 2015a) and the results of the semi-structured interviews with people involved in the on-the-ground management of the areas. N = 122 for the Final Monitoring and Evaluation Report (CEP, 2015a) and N = 12 for Semi-structured interviews.

Notes: the data from the Final Monitoring and Evaluation Report (CEP, 2015a) were adapted from the results of the counterfactual assessment as reported on pages 97-98. The results were averaged across categories (three had data and they were: education and learning; symbolic, spiritual and aesthetic, and; social development and connections) to get a general understanding of the perceptions of the success of the community engagement activities.

The NIAs suggesting that they accomplished minimal community involvement identified the short-term nature of the program and limited national promotion as key problems. The NIAs spoke of the importance of the volunteers but clarified that the involvement of those core volunteers is somewhat independent of the NIA Initiative itself. Essentially, the volunteers as a group are involved regardless of the NIA
program and thus should not be considered novel community engagement. One of the NIAs elaborated a bit on stated objectives and the realities of implementing a landscape-scale initiative with limited resources: “In terms of the wider community engagement, I think that is one of the areas, as we take the NIA principles forward, that we need to look at. That’s not something we got heavily involved in. A lot of our money was spent on delivery, actually making a difference to the habitat,” (NIA iii). Thus, merely having a stated objective does not necessarily mean that an NIA really focused on a particular target such as community engagement.

Some of the NIAs spoke of targeted successes but ultimately concluded that there was little understanding in the wider community of the overall Initiative and its goals. These successes were generally along the lines of those priorities emphasised in the NIA Monitoring System and restricted to certain groups or areas, volunteering or, to a lesser extent, educational visits, as opposed to the wider community. Several NIAs identified problems with limited resources relative to size which prevented widespread community engagement, staffing issues for example. Another NIA spoke of the challenge of embedding it within the local community: “we want it very much to be owned by local community… I think there is an understanding of it. I think that has possibly become more diffused in this phase two, because inevitably when you’re chasing funding for different individual projects [they] also take on their own identity,” (NIA viii). The conclusion amongst these NIAs seems to be moderate success in some areas, largely amongst organisations or people who have an interest in the NIA but not with the community at large. As one NIA sums it up: “I think it’s well known amongst relevant organisations, for want of a better word, stakeholders, I suppose. But in terms – and it, I suppose amongst community groups associated with public open space, it may be fairly well known – but wider than that, no, it didn’t really penetrate people’s consciousness really,” (NIA ix). What emerges is important but limited community involvement across the NIAs, generally targeted to engage certain groups and with little success in penetrating the larger community.

So why might this be so and how could monitoring be improved to encourage more widespread engagement? The driving principle behind community-based conservation, and an important feature of Lawton’s (Lawton et al, 2010) vision, is that conservation objectives and development objectives align so that actions might provide benefits for both people and wild nature (Murphree, 2002), in other words, to foster in the local community a stake in conserving a specific resource, in this case, their local environment (Brown, 2002; NIA 5). One of the main challenges of community-based conservation, however, is that community development objectives
and wild nature conservation objectives are not always consistent (Berkes, 2004), particularly as communities are not homogenous; different groups often have different objectives (Waylen et al, 2010). Rydin and Natarajan further clarify this, stating “the community does not experience or present itself as an aggregate with one common experience of local environmental materiality. Rather, the nature of individual people’s engagement with their environment and how they construct this for the plan-making process can be very specific and personal” (2016, p 1244). Indeed, the NIA Initiative was moderately successful in engaging certain groups but not in engaging the wider community or achieving substantial progress towards step-change in understanding within the communities.

Part of the problem might be the simplistic idea of community engagement envisioned by the NIA. A widely recognised article by Agrawal and Gibson (1999) proposed that there are three types of assumption concerning communities which are quite likely and difficult for community-based conservation approaches; “firstly, that communities correspond with small spatial units; secondly, that they form a homogenous social structure; and thirdly, that community members share norms” (Waylen et al, 2013, p 575). Since the original article, several studies and discussions on conservation have further supported and expanded on the challenges of a simplistic approach to the concept of ‘community’ in conservation initiatives (e.g., Waylen et al, 2013; Berkes, 2004; Kumar, 2005; Larson and Soto, 2008; Flint et al, 2008).

Waylen et al (2010) who conducted a systematic review of community-based conservation studies, suggest that programs like the NIA Initiative are more successful when there is greater community participation, but that participation does not predict behavioural and ecological outcomes, which the researchers identify as “arguably the ultimate goal of conservation interventions” (p 1126) and which is in accordance with Lawton’s (Lawton et al, 2010) desired step-change. Waylen et al (2010) also suggest that interventions delivering community outreach and, specifically, education concerning wild nature conservation were more effective in changing and improving understanding than programs which did not. Furthermore, Waylen et al (2010) suggest there is some support for the argument that information and education is needed in order to engage the public to act on their concerns and get involved in the conservation of wild nature (Jacobson et al, 2006).

The NIA Initiative had clearly stated community engagement and education objectives at both national and local levels as discussed in Sections 4.1 and 5.2, thus, this suggests that the failure of the program to engage the wider community largely
stems from the implementation rather than the design of the Initiative. The program was implemented over three-years, throughout which the NIAs were beholden to a specific agenda. The South Downs indicated in their presentation during the Best Practice Networking Event 3 that community engagement is challenging with objectives that originate from an overseeing body, stating “It’s a difficult role for a community group - Partnerships with professional bodies are vital, The actions and activities of a community group will depend on members’ interests and drive – difficult to align with ‘higher level’ aims & objective…BUT of great value in reflecting the values/drives within the community,” (SD BPNE, 2013 in NIA 3).

6.2.2 The NIA brand: the use of the NIA designation in the individual areas

As discussed in Section 4.1, Lawton et al (Lawton et al, 2010) originally titled his vision for the landscape areas as Ecological Restoration Zones. The concept was then recreated as Nature Improvement Areas for the NIA Initiative. This section specifically explores how the title was used at the local level and what the individual areas felt was the perceived understanding of the NIA concept in their local areas, particularly in light of the management context of the NIAs. To explore these concepts, the following question was asked: “Is the term ‘Nature Improvement Area’ widely used in your local area?”. Of the 12 areas, three said they still used the designation and that it was helpful; four said that it was used but that the brand was not necessarily widely known or in danger of tailing off; and five said that they had never used it or had stopped using it since the end of the initial stage of the program in mid-2015. Figure 6.3 shows the NIAs’ use of the NIA designation.
What emerges is that areas in Management Group 1 generally did not bother with the NIA title as they felt it would confuse the identity of their areas to add yet another designation or even cause backlash because of the perceived conflict with other land uses such as agriculture. Areas in Management Groups 2 and 3 were more positive towards the title but felt that it had not been promoted enough at a national level. This conclusion is corroborated by Best Practice Networking Event 3 which identified in the feedback report for the first year of the Initiative that the NIAs had concerns regarding public perception of the program as well as fears that the wider public was not well-represented in the Initiative (BPNE Agenda, 2013 in NIA 3). It is also evident from the following post-NIA document: Nature Improvement Areas 2012-15, Making Space for Nature on a Landscape Scale (CEP, 2015c), in which different NIAs address the use of the NIA title in very different ways when discussing future plans. Dark Peak, an area in Management Group 1 with a landscape management body as a partner, provided the following statement, “The ethos of landscape scale conservation, beyond ownership boundaries and designated areas, will continue through existing partnerships in the Peak District and South Pennine Moors, building on the foundations of the NIA to improve the uplands for nature and people,” (CEP, 2015c, p 9) in which the NIA title is barely mentioned at all but to suggest it as a foundation from which the partnership will move forward. In contrast, Nene Valley, in which falls into Management Group 3, stated this: “A business plan for 2015-20 has been produced. The Partnership is hoping to secure a Heritage Lottery Fund Landscape Partnership Scheme grant to further develop the NIA with greater
involvement of local communities," (CEP, 2015c, p 16). Clearly, Nene Valley is more likely to continue with the NIA title and pursue greater community involvement, also suggesting that perhaps community engagement was not as robust in the first three-year period.

The potential for backlash against the NIA designation mentioned by some NIAs speaks to the challenge of aligning conservation objectives with wider community objectives; it also specifically highlights the potential trade-offs between wild nature conservation and agricultural land uses which is not addressed by the NIA Initiative. Landowners and managers are discussed by the Lawton Report (Lawton et al, 2010) as a key community group that should be involved in the step-change. However, landowners and managers are not given the same prominence in either the NIA Guidance Notes (NIA 1) or the NIA Criteria (NIA 2) when discussing partnerships although many NIAs did identify the importance of involving landowners / managers and groups at the local level. However, a number of NIAs also spoke of the struggle of involving landowners. One NIA stated “That’s why [the NIA Initiative] never got the buy-in of the estate managers or the farmers. It does quite easily work together with producing food, or having sporting use, but they’re calling it a Nature Improvement Area. Actually, that’s not their driver. The farmer’s driver is to produce good quality animals, so there’s been no real way of working out that linkage, because it’s still, sort of, one side against the other,” (NIA i). Other NIAs noted similar challenges and in fact developed projects to address dialogue. Yet another NIA explained a bit more about the difficulty in engaging with landowners / mangers, particularly farms, in the context of the NIA Initiative, suggesting that the Initiative was more suited to a situation in which there were fewer larger farms rather than many, smaller farms. This also speaks to the challenge that communities are not homogenous entities but made up of various actors with diverse opinions. Regardless, the disconnect in recognising what might be termed the local cultural context of the areas at the national level likely hampered some aspects of community engagement, particularly the wider promotion of the program. This is a key challenge which landscape-scale initiatives like the NIA Initiative must overcome. Schwartz et al (2017) address the role of the landowner in their spatial assessment of land under conservation management in England and ultimately emphasise that large-scale conservation initiatives have great potential but that engaging effectively with landowners is vital for success. Waylen et al (2010) address the importance of context emphasised throughout this thesis, stating “conservation interventions are more successful if they understand and respond to
local institutions and culture. Interventions that ignore traditional values and beliefs are less likely to succeed (Stevens 1997)". (p 1126).

6.3 Collaboration, both within the Initiative and beyond…

Collaboration was a key feature of the NIA Initiative; the NIAs were to be wide partnerships of local people with a shared view for their environments as discussed in Section 4.1 and clearly stated in Table 4.1 which lists the policy drivers of the NIA Initiative. However, it has already been established that the partnerships were not necessarily the wide-reaching groups of community stakeholders that either the Lawton Report or the NIA Initiative as it was designed envisioned, as demonstrated in Section 4.2. This section further explores the collaboration of the NIA Initiative. There are, however, a number of different types of collaboration:

1) collaboration or partnership working within the NIAs which, as mentioned, was previously discussed in Section 4.2;
2) collaboration between NIAs, that is shared learning and dissemination of information during the three years of the program; and
3) collaboration with other initiatives or programs outside the NIA Initiative.

This section predominantly focuses the collaboration between NIAs and the collaboration with other initiatives.

6.3.1 Partnership working and collaboration within the NIAs…

Partnership working within the NIAs was a very important aspect of the NIA Initiative vision and was emphasised in both the Lawton Report (Lawton et al, 2010) and the NIA Final Monitoring and Evaluation Report (CEP, 2015a). The collaboration of these local people and community groups was considered at the national level to have been a very successful aspect of the NIA Initiative: "More effective partnership working was felt to have been a key benefit of the NIA initiative." (CEP, 2015a, p 115). The Report also emphasised that respondents who took part in their semi-structured interviews or surveys also felt this way. Ultimately, the Final Monitoring and Evaluation Report concludes that: "partnerships bringing conservation organisations together with local businesses, land managers, research institutions and local authorities proved
effective in delivering land management in the integrated way envisaged by the NIA initiative,” (CEP, 2015a, p 127).

However, this work largely disagrees with that assessment; Section 4.2 sets forth the evidence for the conclusions that:

1) The NIA partnerships were, in seven cases, already largely formal partnerships operating at a landscape scale, while three other partnerships were more informal but existing;

2) Eight partnerships did not in fact involve new partners in any significant capacity;

3) The visions and objectives for the partnerships were largely (in eight partnerships) driven by existing management strategies, which were possibly shared but motivated principally by lead bodies or organisations with their own priorities.

The reason for the limited involvement of new partners was largely a feature of the scale of the program relative to its ambitions. The NIA Initiative as a landscape-scale program designed and implemented over three years did not provide much opportunity to involve other partners outside the existing stakeholder groups in the NIA process as discussed in Section 5.1. However, a few NIAs did develop new or expand existing partnerships. Perhaps the best example of a partnership which did succeed in establishing a new and effective partnership is that of Marlborough Downs.

Marlborough Downs was the only example of a partnership that operated from the ‘bottom-up’ so to speak. It was a comparatively small partnership between independent farmers, the Wiltshire County Council and the Game and Wildlife Conservation Ltd which came together to form the Marlborough Downs NIA Ltd (CEP, 2013). The respondent, when asked about the formation of the partnership, had this to say: “So we then formed a partnership. And the partnership was formed with, again, the Wildlife Conservation Trust…So we got the chief man of Wiltshire County Council who does all rights of way and byways and what-have-you. He came on the Board, along with [proper name], and elected farmers. So, there is a Farmer Board and over the Farmer Board was the partnership. The partnership was between the farmers on the one hand, [proper name], with [their] expertise, and the Wiltshire Council. They met every quarter. The Farmer Board met every month. The Farmer Board was made up of farmers only…And they were the people on the ground,” (Interview). Indeed,
the interview made it clear that the partnership allowed groups to collaborate which had not previously worked together. This was true not only of the partnership but also as part of their larger activities: “suddenly the man who has been studying grasses all his life can walk anywhere on the Downs. Before, he had to ask permission. He didn’t know where he was going,” (Interview). Marlborough Downs in many ways provides a good example of the partnership the NIA Initiative sought, the collaboration between varied groups all working towards a similar goal. However, the emphasis on existing partnerships, the rushed timeline and the obstacles to implementation for new partnerships discussed throughout chapters 4 and 5 prevented this model from really being achieved in most NIAs.

6.3.2 Collaboration between NIAs…sort of

Collaboration between the NIAs was a key feature of the Initiative; the NIA Criteria, under the heading ‘Sustainability of Outcomes and Value for Money’ state that NIAs should demonstrate “shared learning and dissemination of expertise within and beyond the NIA pilots.” (NIA 2, p 5). Of note is that it specifies both within and beyond the Initiative. To facilitate this collective learning and dissemination of information between the different NIAs, a number of best practice events were organised to take place throughout the three-year period from 2012 to 2015. There were six of these events, all detailed in the NIA Timeline in Section 5.1.

The final report released on the NIAs (CEP, 2015a) states that the “NIA partnerships reported that knowledge and data sharing has been enhanced by the partnership-led approach,” (CEP, 2015a, p 44). The report goes on to explain this further, asserting that “84% of survey respondents felt that the sharing of data and information was ‘improved’ (58% of respondents) or ‘much improved’ (26%) due to the NIA partnership. 89% of respondents felt that learning through dissemination was ‘improved’ (64% of respondents) or ‘much improved’ (25%).” (CEP, 2015a, p 44). This was assessed by means of the following question: “To what extent is information and knowledge sharing supporting the NIA partnerships in achieving their objectives?” (CEP, 2015a, p 44).

The Year 3 Monitoring and Evaluation Report (CEP, 2015a) also indicates that some NIAs signposted some challenges to knowledge sharing and collaboration, specifically “that the ‘infrastructure for facilitating sharing and knowledge exchange has been a bit absent’ and that the majority of sharing was through personal contacts
It is not clear what the respondent meant by ‘infrastructure’ but the Final Monitoring and Evaluation Report (CEP, 2015a) interprets this as facilities “designed specifically to support the exchange of knowledge and information,” (p 63). The Final Monitoring and Evaluation Report (CEP, 2015) highlights, however, that “All NIA partnerships did however have access to the Huddle NIA workspace which has been designed specifically to support the exchange of knowledge and information,” (CEP, 2015a, p 63). According to the report, some NIAs also felt that the knowledge and information sharing also lacked national leadership: “everyone was waiting for Natural England and Defra to do things to a certain extent (e.g. around Huddle and annual Forums), but there was no clear lead taken in this sharing role initially,” (CEP, 2015a, p 63), though the Report again addresses this by suggesting information sharing improved in the last year. Finally, the report indicates that one NIA suggested that, despite the scheduled best practice events, timing hampered collaboration. Ultimately, despite these challenges, the report considers that knowledge and data sharing was improved by the NIA Initiative.

This work, however, finds the above assessment to have significantly overstated the information / knowledge sharing and collaboration amongst NIAs. In fact, all twelve NIAs indicated that knowledge sharing and collaboration amongst the NIAs was limited and most felt that, even though there might have been some collaboration, it could have been much more successful than it was. Even NIAs which did manage some knowledge sharing and collaboration stated that it was largely due to proximity and personal connections. Some NIAs specify that what knowledge and information sharing did exist was very useful, but that it was quite limited overall. Figure 6.4 demonstrating the feelings of all 12 NIAs regarding information / knowledge sharing and collaboration between the NIAs.

The most prominent example of collaboration between NIAs is a project called Sciencewise which involved only three of the areas (NIA 5) but was considered to be quite successful by those NIAs which did participate. Sciencewise was a project that was intended to encourage public discussion thus facilitating new and innovative means to engage with local people, improved insight into public dialogue and enhanced participation of local people in decision making. The stated aims of the project, according to the NIA Public Dialogue Project – Overarching Report (Natural England, 2015), were “To embed public dialogue into local decision making for the development of integrated biodiversity, landscape and ecosystems policy and practice, within the context of localism and Big Society.” The NIAs identified it
specifically as a means to facilitate dialogue about areas where there was conflict between current uses and conservation.

Each of the NIAs clearly felt that the project assisted them to achieve NIA objectives but, as it was specific to only those three NIAs, the impact was limited in scope. Furthermore, while the NIAs collaborated to achieve the initial funding, there was little collaboration in the implementation of the projects within the three areas. The project was considered to have been moderately effective according to outside assessment (Bennett, 2015. The most significant challenge to the project was the funding process: “A more appropriate funding process would have been a productive investment and paid off in the long term. Specifically, the process used in this case could be built on and improved by increasing clarity and detail in the invitation to bid, as well as support to NIAs during a longer initial bidding process. This is the single most important lesson from this project, and has more impact than the rest of the lessons combined,” (Bennet, 2015, p 4-5). The bidding for this project was done in conjunction with the bidding for the wider NIA Initiative. That the short funding process was highlighted as the most significant challenge illustrates the role the short timeline for both the bidding process and the actual implementation of the Initiative had to play in limiting wider participation and collaboration.

Figure 6.4 A figure of the NIA respondents' assessment of the collaboration and knowledge sharing between different NIAs during the three years of the program.

NIAs were asked the following question: Did you collaborate with other NIAs?

Some: “There was the NIA network, so there was a little bit of swapping of ideas. There was a network set up where we could communicate. We had the contacts and we could ask questions and get ideas from others,” (NIA ii).

Minimal: “If I’m honest, no [we didn’t work a lot with the other NIAs],” (NIA ix).
6.3.3 Collaboration with other initiatives outside the NIAs

Collaboration with other initiatives outside the NIA was not necessarily a key feature of the NIA Initiative objectives but it was clearly emphasised as desirable in both the NIA Guidance Notes (NIA 1) and Criteria (NIA 2): “A candidate Nature Improvement Area will:...link with any existing landscape-scale initiatives in the vicinity, and/or with other recognised areas for enhancement,” (NIA 2, p 3). It is possible that the emphasis on linking with other programs was intended to facilitate another key action of the NIAs, that they “Demonstrate how shared learning and dissemination of expertise within and beyond the NIA project will take place,” (NIA 1, p 12). Despite this emphasis on linking with other programs, however, there was no feature of the NIA Initiative implemented at a national level that was designed to specifically link or share NIA activities directly with the activities of another initiative; it was largely dependent upon local actions. The Final Monitoring and Evaluation Report (CEP, 2015a) sums this up through the following statement: “The NIA best practice events, annual forums and other workshops held during the three grant funded years were also recognised as providing a good basis for connecting with others and sharing experiences across NIAs. It is not clear how much this sharing extended beyond the NIAs,” (CEP, 2015a, p 118). None of the indicators of partnership working were designed to examine collaboration with other initiatives, merely collaboration with partners or stakeholders actively involved in the NIA Initiative. The Final Monitoring and Evaluation Report (CEP, 2015a) makes this clear, stating that “The focus of the objectives under partnership working is on the collaboration with partners,” (CEP, 2015a, p 156). Thus, as a result, no information is provided in the Final Monitoring and Evaluation Report (CEP, 2015a) on how much the NIAs were able to collaborate with others outside the Initiative. This work examines that oversight.

NIAs were asked the following question: Was there collaboration with programs outside the NIA Initiative? Eight NIAs commented on the potential for collaboration with other initiatives; of those eight, seven described the difficulty in collaborating with other initiatives as a result of what was referred to by several NIAs as some ‘competition’ between different programs. One NIA summed it up thus: “At the moment you’ve got this competition, really, between RSPB Futurescapes, Wildlife Trust Living Landscapes, I think the National Trust have come up with some sort of landscape brand now as well. I’m not saying it should replace those, but it could have been an overarching principle,” (NIA vii). Despite the perceived lack of national leadership on the matter, the NIAs themselves generally expressed an interest in...
collaboration with other initiatives. Some even tried but were not successful. Many felt that this was generally a result of a lack of coordination at a national level.

One area in which collaboration was not fostered and which caused particular concern for a few NIAs was the role of the Local Nature Partnerships and their connection with the NIA Initiative. Local Nature Partnerships or LNPs are “partnerships of a broad range of local organisations, businesses and people who aim to help bring about improvements in their local natural environment.” (Role of Local Nature Partnerships: an overview Guidance, https://www.gov.uk/government/publications/role-of-local-nature-partnerships-an-overview). They form a key NEWP (Defra, 2011b) commitment and echo recommendations of the UK NEA (2011) for a landscape-scale approach to managing the natural environment. However, the areas have a local focus; “they will work in a way that best suits the needs and challenges of their local area,” (https://www.gov.uk/government/publications/role-of-local-nature-partnerships-an-overview). National leadership is limited as compared to the NIAs: the government commits to “offering some level of support,” (An overview of the Local Nature Partnership role, 2012, p 4) largely in the form of recognition. To affirm their role, the government “developed an application process to give successful applicants that credibility” (An overview of the Local Nature Partnership role, 2012, p 1) and establish the status of the LNPs, of which they recommend that 50 be created all over England.

Little guidance is provided on how the LNPs would interact with the NIA Initiative, something noted at both national level within public bodies (personal communications) and local level amongst some NIAs. The NIAs are mentioned once in the LNP Guidance, as follows: “LNPs could work with and support the 12 Government-funded Nature Improvement Areas and help to establish new NIAs wherever the opportunities or benefits are greatest, driven by the knowledge and vision of local partners. It is, however, for the LPA to decide whether and how to recognise an NIA or other ecological network in their local plans,” (An overview of the Local Nature Partnership role, 2012, p 5). This lack of clarification proved troubling for a few of the NIAs. One said, “there was never that clear relationship between Local Nature Partnerships and NIAs, and I guess they’ve fallen out in, you know, different ways,” (NIA i). Another explained that, when their NIA was transferred to the care of the relevant LNP after the initial NIA funding period ended, they felt that the NIA objectives were not clearly translated nor was the LNP prepared for the responsibility of the NIA. The transfer of responsibility of the NIA to the LNP also illustrates the short-term nature of the program and the difficulties for NIAs with less established
management groups in the long-term; essentially, the partnership did not continue past the initial three years and so responsibility for the NIA was transferred to another body.

The question then becomes what might have fostered shared learning and dissemination of knowledge or collaboration between the NIA Initiative and other programs? In order for the NIA Initiative to have been successful, it would likely be necessary for the role of the Initiative in the long-term to be clarified. As discussed in Section 5.1, the Initiative was presented by the lead public bodies in such a way as to indicate it was not necessarily going to have long-term national support and promotion due to the acknowledged challenges around funding. As a result, many of the NIAs did not approach the Initiative as a long-term prospect but merely the next funding opportunity, a stopgap measure or step in their longer-term plans. Having been perceived as a temporary measure, the Initiative has faded from prominence, particularly since the end of the funding period; for instance, it was only mentioned once in the 25-Year Environment Plan (Defra, 2018b). Problems with the planning and implementation of conservation programs such as the NIA Initiative are not surprising; indeed, Knight et al (2006) identify three broad steps or categories of activities in the creation of a conservation initiative; systematic assessment, planning and management. The researchers further suggest that all steps are important but that the scientific literature often focuses on systematic assessment over planning: “Defining the scope of each of these activities is essential for ensuring effective conservation action...By our definition, many of the publications in peer-reviewed journals represent systematic conservation assessments, not conservation planning, because they contain no links to processes for developing implementation strategies or stakeholder collaboration and so are unlikely to be effectively implemented,” (Knight et al, 2006, p 409). In essence, the NIA Initiative suffered from poor implementation, a fundamental problem with the scale of the program relative to its ambitions.

Since the end of the three-year funded period, NIAs have continued with the previous, existing partnerships in many cases or, in other cases, been merged with other programs such as the LNPs in areas where previous partnerships had been more informal. While the Local Nature Partnership Program might be considered an appropriate follow-on to the NIA Initiative, and indeed has similar objectives to those of the NIA Initiative, the emphasis in the LNP program is on the local-scale; it does not have the same national clout that the NIA Initiative might have had as a nationally unified program led by a public body. Ultimately, what emerges is that the NIA
Initiative, with its goal of bringing together diverse stakeholders as described in Section 4.1, might have had the potential to overcome the competitiveness of different programs and foster collaboration between a variety of different initiatives but, as it stands, it seems a missed opportunity as a result of the short-term nature and poor implementation of the program. Limited collaboration in turn limits progress towards the desired step-change. As one NIA stated, “If we’re really going to make the step-change, we have to pull everyone along,” (NIA vii).

6.4 National leadership

The support of the national agencies was emphasised as key to the success of the NIA Initiative; “The Natural Environment White Paper commits Government to assist partnerships of local authorities, local communities and landowners, the private sector and conservation organisations to establish new Nature Improvement Areas (NIAs), based on a local assessment of opportunities for restoring and connecting nature on a significant scale,” (NIA 2, p 2). The support might take various forms. For example, the national agencies were to assist in providing data to support the original bids. National specialists were also to support newly implemented monitoring efforts. Perhaps most significantly, the national agencies oversaw the sharing of information and knowledge throughout the initiative.

While no indicators used in the NIA Monitoring System address national leadership, the final assessment conducted in the Final Monitoring and Evaluation Report (CEP, 2015a) did examine the contribution of national leadership to the NIA Initiative. To investigate the value of national leadership to the Initiative, the Final Monitoring and Evaluation Report asked the following question: “How has support from Natural England, Defra and other agencies supported the NIA programme?” (CEP, 2015a, p 143). The Final Monitoring and Evaluation Report considers the national leadership to have been extremely effective: “visible government support and leadership and a clear policy message provided impetus for local project delivery and helped local projects in sourcing additional resources,” (CEP, 2015a, p 127). Funding in particular is emphasised as having been enhanced as a result of government support: “National (government) leadership and recognition was important for the NIA initiative: it motivated people delivering projects locally and provided authenticity and visibility that was used, for example, to support funding bids and to encourage wider engagement,” (NIA IX, p xix). Furthermore, the Final Monitoring and Evaluation
Report suggests that the NIAs felt this as well; “The role of statutory agencies in supporting the NIA initiative and NIA partnerships was noted by many partnership chairs as being an important factor in their success” (CEP, 2015a, p 118).

The impact of national leadership in this study was assessed by asking the following question: “What has or has not worked as well with the NIA Initiative?” In response to this question, nine NIAs commented on the national leadership in their interviews; all nine felt that national leadership had not been as effective as it might have been, particularly in promoting the program and some of the NIAs felt that it impacted their understanding of the future of the Initiative, notably in the latter part of the three-year period. As one NIA stated, with some consideration, that the NIA Initiative was an ambitious program that was hampered by disorganised leadership; “Politically [the NIA Initiative] came at a time when there were massive cuts to Natural England. So, really, you know, it didn’t feel like the NIA process had a massive support…I guess that’s where it feels like… There’s no, sort of, leadership there,” (NIA i).

Many NIAs identified the lack of support at the national level, particularly the short-term nature of the funding, as a real challenge. Others considered that it was a lack of promotion at the national level which really hampered the initiative, particularly as national support was perceived as valuable in sourcing funding. Ultimately, what is clear is that many of the NIAs felt that the national leadership of the NIA Initiative was not as robust as it might have been. The following quote perhaps sums it up best: “What we’re all looking for at the moment is more leadership from Defra and Natural England to give a commitment to that [landscape] approach and what they’re doing, even if they can’t provide huge amounts of funding. I think there’s a very strong feeling out there that that’s what we would like…I have to say it doesn’t feel that that support is necessarily echoed elsewhere in different national organisations. Maybe Natural England, but certainly Environment Agency, Forestry Commission, Defra, it felt at the beginning of the NIA programme that this was a really brave new world and it was only just the beginning and all kinds of things. Then gradually it changed so, that, ‘You know you were only just case studies or trials,’ and then it got to the stage where in September 2014 the chair of Natural England stood up and said, ‘Effectively, you won’t get any more cash, you’ve been lucky to get what you’ve got.’ I think an awful lot of people felt very, very bruised about that,” (NIA viii).

The perceived lack of national leadership and support, particularly at the end, impacted how some NIAs viewed the future of the Initiative, with some NIAs suggesting the momentum was lost. Ultimately, the lack of leadership was also seen
as undermining the foundational purpose of the Initiative, progress towards achieving the step-change in nature conservation, which is discussed in detail in the next section, Section 6.5. However, the following comment sums up the section about the inadequacies of the national leadership and its impact on achieving the step-change; “Conservation bodies are doing work for conservation as best they can, and they’re looking for funding to do that, and that’s coming from a range of sources. To improve those habitat linkages, and to expand those areas, that needs some extra mechanism beyond, you know, the scale of what the NIA funding was…That, to me, seems a different thing to trying to change what the farmers and estate managers understand as what the role of the [specific area] is. That’s quite complicated, and that takes national leadership, in a way, but there hasn’t been any national leadership about that, I don’t think,” (NIA i). It should be noted that many conversations with folks at public bodies overseeing the Initiative emphasised the wider political challenges and the resource challenges of the time; this work illustrates perceptions at local levels but acknowledges the challenges faced by those operating at national levels.

What factors then contributed to the perceived lack of national leadership among the NIAs? Part of the problem was likely a lack of resources at the national level, which impacted personnel continuity (personal conversation). However, a lack of clarity in the national objectives likely also contributed to this challenge. The NIA Initiative had both national and local ambitions; it intended to provide a landscape-scale approach that funded twelve areas across the whole of England, yet it had local ambitions to engage a variety of local people in the dialogue and achieve a step-change in the current approach to conservation. Those are very different, potentially conflicting, objectives at multiple scales and certainly too ambitious relative to the resources of the program; as Tear et al (2005) state “Conservation objective setting often mixes scientific knowledge with political feasibility in such a way that one cannot tell where the science stops and the political pragmatism takes over” (p 836). Indeed, while there are many landscape-scale programs operating in England (discussed further in Section 7.1), it is possible that the NIA Initiative might have been able to differentiate itself by operating at a higher level and seeking to join up conservation actions between various organisations more, particularly with the support and leadership of public bodies. Bode et al (2011) suggest that while little research to date has focused on how interactions among conservation organisations affect the protection of biodiversity (Sutherland et al, 2009; Haley and Clayton, 2003; Koch, 2010), their work suggests that the features of two collaborating organisations were better protected when organisations cooperated than when organisations acted independently. In
other words, cooperation amongst landscape-scale initiatives has the potential to provide enhanced benefits for wild nature. To achieve this cooperation, however, it is necessary to have high-level, systematic conservation planning and this “planning, when extended across the many thousands of landscapes and seascapes where it is needed, therefore represents a large financial commitment by agencies and NGOs” (Pressey and Bottrill, 2009, p 474). Adams et al (2014) emphasise the point that there are limits to what non-state actors can achieve under existing circumstances and that public bodies cannot simply “slough off responsibility” (p 585). Indeed, they suggest that “the formal mechanisms required to ensure the long-term sustainability of conservation gains in [large conservation areas] may require government to take an active role in steering social and economic processes towards publicly desired outcomes,” (Adams et al, 2014, p 585). The implementation of the NIA Initiative lacked effective planning, particularly in objective-setting, revealing the limited investment and commitment, in all senses, of the public bodies leading the Initiative.

6.5 Behavioural change…were the NIAs effective in working towards the desired step change?

This section brings together all the outcomes examined in Chapter 6 and explores whether the Initiative has truly achieved progress towards the step-change in nature conservation as it was envisioned by Lawton et al (Lawton et al, 2010). This is addressed here by examining behavioural change as reported by the NIAs about their local communities with particular consideration for the partnerships’ management contexts. Behavioural change was not addressed in the Final Monitoring and Evaluation Report (CEP, 2015a). The following question was asked for this work to examine behavioural change: “Could you discuss how the establishment of the NIA has or has not impacted the community or partnership?”.

Eight NIAs discussed behavioural change in the context of their local areas. Of those eight, two reported positive behavioural change, four indicated moderate successes in some areas and two reported negligible success. Both NIAs which reported some sort of positive behavioural change fall under Management Group 3. The challenges of managing diverse objectives and encouraging people to value their local landscapes were prominent themes throughout almost all the NIA responses.

The two NIAs reporting positive behavioural change both identified shifts within their partnership approaches, one with regard to the focus of the partnership activities and
one with regard to collaboration. Both NIAs were newly formed partnerships without existing formal relationships and this likely helped with the behavioural change; there was no pre-existing management plan or body to direct work, so the Initiative fostered new approaches. However, it should be noted that neither of these successes speaks to broader engagement or behaviour change within the communities.

For the six NIAs reporting moderate or negligible behavioural change, many discussed the challenges in addressing potential trade-offs in land use with landowners or managers. “You get some [farmers] who are really keen, and their values are important, maybe they’re already in HLS and that kind of thing, or they want to be, and they’re keen. You’ve got the ones who aren’t that keen until you mention funding and then suddenly remember that 30 years ago their farm used to have meadows and they always used to like seeing the hares and all these kinds of things, then suddenly they’re interested. Then, for whatever reason, you get the ones that just aren’t interested because… I was going to say because farming is a business, farming is a business to all of them but if what you’re saying doesn’t meet with how they run their business then it’s not going to work out,” (NIA xii). All emphasised aligning objectives with those of the farmers / landowners and their businesses, acknowledging that the areas are ‘working landscapes’ but some NIAs also stressed communication, noting that engagement was most successful when approached one-on-one.

Others discussed the difficulty in engaging the wider community in landscape conservation, in encouraging people to value their local areas. “I think in [this area] it’s quite a challenge because it’s a fairly small area, we’ve got a lot of designated sites and we get a lot of visitors. There’s not a huge population, but there’s a big population in [specific town / city] and [second specific town/city] quite close by. I think 30 years ago there was quite a fairly exclusive protectionist view about the countryside. That the designated sites are there for their own sake, they’re there to conserve and actually you don’t want too many people visiting. I think almost without exception there is much more an acceptance of the view that actually we do… I think most of the people who are in this kind of work do want to conserve it for its own sake. I do, I think that’s important. But you’ve got to conserve it for the people around. If those people don’t value it, they’re not going to care if anything happens to it and they’re not going to be ensuring that their behaviour conserves it. That was one of the really key reasons we wanted to embed the community stuff as much as we could,” (NIA iv). The importance of working to promote the value of the natural areas within
the community was emphasised by several NIAs and speaks to the challenge again of heterogenous actors with potentially varied motivations.

So why was behavioural change limited in the NIAs? Again, this likely partly stems from the scale of the program relative to its ambitions, particularly the multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement. Realistically, three years is a short period to implement large-scale habitat restoration and creation alongside improvements in ecosystem service delivery as well as a programme of events to engage a variety of people in order to achieve progress towards a step-change in their interactions and perceptions of nature. This has been flagged by other work as a significant obstacle: Dwyer and Hodge (2016) state that in their work “considering the policy framework for appropriate institutions, the experience of LPs and NIAs suggests that short-termism poses a significant obstacle to achieving [social residual claimant]-style arrangements and outcomes. This issue becomes particularly acute in periods of low and/or reducing public funding, as it will reduce the resilience of the structures concerned and thus be likely to reduce their potential to make a difference, for the long term," (p 9). However, the presentation of the NIA Initiative might also have potentially contributed to the limited success with regard to behavioural change. The lack of consideration for the local contexts of the areas has already been discussed in Section 6.2 with regard to the NIA brand. However, this work would argue that the problems extend beyond merely the title or designation ‘Nature Improvement Area’ to the larger implications of that name; while the title suggests that the program is focused on improving nature, a potential flag to landowners and managers, the national objectives were also pressing for ecosystem service delivery. In contrast, though, at the local level, the NIAs were largely focused on biodiversity conservation priorities, improving nature essentially, as discussed in Chapter 5 and Section 6.1, particularly as some NIAs felt that the ecosystem service concept does not engage local people as effectively. As one NIA stated: “So, if you come to ecosystems services, it’s trying to say, ‘Well, this is just of a monetary value,’ again, where, actually, it needs more of a… It’s about people’s, sort of, values, as more important, really, for changing the approach to land use," (NIA i). This disconnect highlights the lack of consideration in the NIA Initiative for local context discussed throughout this thesis but identified as crucial in the Lawton Report (Lawton et al, 2010). National leadership is important for guiding the landscape-scale features of the Initiative, but local values must also be considered. The Lawton Report (Lawton et al, 2010) emphasises this early in the Report, stating “We are not proposing a heavy, top-down
set of solutions. It is a long-term vision, out to 2050, and defines a direction of travel, not an endpoint. This vision will only be realised if, within the overall aims, we work at local scales, in partnership with local people, local authorities, the voluntary sector, farmers, other land managers, statutory agencies, and other stakeholders. Private landowners, land managers and farmers have a crucial role to play in delivering a more coherent and resilient wildlife network. And it will require leadership from Government,” (p ii).

6.6 Conclusions

**Biodiversity conservation outcomes were emphasised over ecosystem service delivery outcomes at both national and local scales.**

There are headline, national statistics for biodiversity outcomes describing the biodiversity work completed by the NIAs but there are no similar ecosystem service delivery outcomes. In fact, the ecosystem service outcomes for the NIA Initiative are predominantly assumptions based on the fact that work undertaken as part of the biodiversity conservation targets will also have improved the delivery of ecosystem services. Respondents to the government’s survey of NIA outcomes plainly indicate mixed thoughts on how much the NIAs contributed to the promotion of the ecosystem service concept or to the improvement of the delivery of most ecosystem services considered by the Initiative.

Eight of the individual NIAs clearly prioritised biodiversity outcomes over ecosystem service outcomes. Many of the NIAs had both biodiversity and ecosystem service objectives, but, when discussing their priorities, indicated that they were focused on the biodiversity outputs outcomes. Any improvements to ecosystem service delivery were secondary benefits of their primary target: the conservation of wild nature. Although the problems associated with the ecosystem service indicators likely contributed to this imbalance, the emphasis on biodiversity outcomes over ecosystem service outcomes ultimately stems from the priorities of the stakeholder groups directing the activities and delivery in the individual NIAs. This imbalance also speaks to a divide between national and local objectives and the challenges of making the ‘academic’ concept of services relevant at a local level to the communities.
There was limited involvement of the wider community in the NIA Initiative; this occurred across scales including at a local level within partnerships, between NIAs and with other programs at a national level.

Nine NIAs reported moderate or limited community engagement. Those NIAs reporting some type of community engagement were largely focused on certain types of activities encouraged by the NIA Monitoring System, namely education and volunteering. Thus, little progress was made in achieving wider community involvement. Wider community involvement was partially hampered by constrained collaboration of the NIAs with local communities and stakeholders within partnerships as a result of the design of the Initiative, minimal collaboration between NIAs due to the implementation of the Initiative and almost no collaboration beyond the Initiative due to insufficient national leadership.

Ten NIAs developed from existing partnerships. Eight partnerships did not involve new partners in any significant capacity. The visions and objectives for the partnerships were, in eight NIAs, largely driven by the lead bodies or organisations which had their own priorities, thus hampering the desired shared view for the local environment. All 12 NIAs described limited collaboration between NIAs. Seven NIAs discussed the challenges in connecting with other programs as a result of the rushed design and implementation process and problems with national leadership in the NIA Initiative.

Insufficient national leadership was a major problem for the NIA Initiative.

Nine NIAs identified national leadership as insufficient and lacking clarity in objectives; this resulted in what the NIAs felt were ‘missed opportunities’ to make the NIA Initiative more effective in achieving the desired step-change in nature conservation. Several NIAs identified a lack of support from the organisations at a national level in promoting the NIA Initiative and its goals so that ultimately, while it was well-known among stakeholders and relevant conservation organisations, it did not really penetrate into the consciousness of the larger population. It was also felt that the lack of national leadership, particularly at the end, called into question the continued effectiveness of the NIA Initiative beyond the initial three-year period.
The NIAs, by and large, did not achieve much progress towards the desired step-change in the current approach to conservation.

The limited community engagement and the lack of collaboration at all levels of the NIA Initiative prevented the Initiative from truly achieving a substantial step-change in nature conservation. It did not engage the wider community and encourage an understanding of the natural environment leading to behavioural change. While the NIA Initiative absolutely did do important work, it essentially enabled existing partnerships to, in large part, continue on with their existing structures and management strategies as opposed to really engaging groups not necessarily as involved in the conservation dialogue and facilitating innovation in wildlife conservation.

7 The Future of the NIAs

The focus of this chapter is to examine whether the NIA Initiative varied in any significant way to other landscape-scale programs in the UK and to understand what lessons this work can provide to improve future landscape-scale endeavours. This analysis pays particular attention to the framing of the conservation approach utilised in the national and local objectives of the NIA Initiative, particularly its multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement as a means to achieve a ‘step-change’ in nature conservation. Landscape-scale programs embody an integrated approach which addresses the entirety of the social-ecological system in theory but, in practice, often focus on biodiversity conservation over the other two objectives (Eigenbrod et al, 2016). This work seeks to explore how the NIA Initiative compares to other landscape-scale programs in the UK, and then using work from the previous chapters, to identify particular strengths and weaknesses of the Initiative which can inform future work.

This chapter addresses research question four: Was the NIA initiative different to previous landscape-scale programs in the UK and how can the successes and limitations of the NIA Initiative be recognised for future landscape-scale management programs to promote sustainable land management through continued biodiversity conservation, ecosystem service delivery and community engagement? By providing insight into whether the NIA Initiative differs substantially to other landscape-scale programs, this chapter aims to deliver understanding of the success or otherwise of the NIA Initiative in working towards its
major objective of a ‘step-change’ in nature conservation and contributes to scientific knowledge about the twelve Nature Improvement Areas in England and landscape-scale programs in general. This chapter starts with the assumption that any program should be along the lines of the NIA Initiative in fundamentals, that is, a three-year program with approximately £7.5 million in funding from government sources, then seeks to address the roots of the problems highlighted in Chapters 4-6 to make recommendations for similar future endeavours with multiple, potentially conflicting objectives.

This analysis incorporates documents including the Lawton Report (Lawton et al, 2010), NIA data including Guidance Notes (NIA 1) and NIA Criteria (NIA 2) as well as local knowledge and experiences from each of the 12 NIAs and, where possible, triangulates the document assessment with data from the semi-structured interviews. Particular attention is paid to variations in themes between scales, namely the national level and local level.

The research question is addressed through a number of objectives that are structured as follows:

Section 7.1 explores the features of the NIA Initiative in the context of other landscape-scale programs in the United Kingdom;

Section 7.2 examines the national and local framings of the NIA Initiative in the context of the evolution in the modern (1960s to present) framing of conservation, particularly focusing on the relationship between people and nature;

Section 7.3 discusses the funding of the NIA Initiative in the context of two other landscape-scale conservation programs;

Section 7.4 concludes the chapter with an overview of the key findings.

### 7.1 Designing the program; how to achieve the step-change?

This section explores the first part of the research question stated in the introduction to this chapter: was the NIA Initiative different to previous landscape-scale programs in the UK? This question essentially seeks to understand how the NIA Initiative as a landscape-scale conservation program compares to other programs in the UK. In order to address this question, this work examines research by Eigenbrod et al (2016) which conducted a review of landscape-scale programs in the UK including the NIA
Initiative (although not dealing with the NIA Initiative in detail). The section starts by exploring the findings of the review by Eigenbrod et al (2016), then addresses the NIA Initiative by comparing the Initiative to the trends noted in other programs. The discussion follows a similar format to Chapter 5 and specifically focuses on three areas: program design and objectives; site selection and management; and activities and monitoring. Eigenbrod et al (2016), to conduct their assessment, identified and populated a database with information on 829 landscape-scale conservation programs, requested participation from program participants in a survey and further contacted a sampled sub-set of 27 of the 829 for in-depth interviews.

7.1.1 Landscape-scale programs in the UK

Design and objectives

According to Eigenbrod et al (2016), wildlife and biodiversity, namely habitats and species, made up the largest share of objectives of landscape-scale programs in the UK; in fact, 668 programs (out of 829) had or have wildlife and biodiversity as a primary objective, though not necessarily as a principal objective. Though large-scale initiatives often concentrate on habitats as opposed to species-focused activities, nonetheless, the assessed initiatives still prioritised objectives and actions targeted toward specific species. Much of the habitat and species work was focused on existing protected areas or reserves, specifically, direct expansion or physically linking these areas, both key features of the ecological network concept as put forth in the Lawton Report (Lawton et al, 2010). The initiatives of the 14 largest programs listed in Table 7.1 combined cover over 254,000 km²; when the areas of all the initiatives are summed, the total area covers more than 484,000 km². As these figures are in fact both larger than the area of Great Britain (which is 229,848 km²), it reveals the significant overlap of initiatives in both time and location (Eigenbrod et al, 2016). It also indicates that the specific areas of focus for lots of initiatives is much larger than the area(s) being actively managed within the initiative; in other words, often the existing network of protected areas is prioritised.
Table 7.1 The 14 largest landscape conservation programs in the UK.

<table>
<thead>
<tr>
<th>Program</th>
<th># of Initiatives</th>
<th>Lead Agency</th>
<th>Launch date</th>
<th>Total area (km^2)</th>
<th>Average size of individual landscape area (km^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living Landscapes</td>
<td>120</td>
<td>Wildlife Trusts</td>
<td>2006</td>
<td>24,669</td>
<td>205.6</td>
</tr>
<tr>
<td>HLS Target Areas</td>
<td>110</td>
<td>Natural England</td>
<td>2005</td>
<td>48,268</td>
<td>438.8</td>
</tr>
<tr>
<td>Butterfly Conservation</td>
<td>78</td>
<td>Butterfly Conservation</td>
<td>2000</td>
<td>47,898</td>
<td>614.1</td>
</tr>
<tr>
<td>Landscape Target Areas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catchment Sensitive Farming</td>
<td>66</td>
<td>Natural England / Environment Agency</td>
<td>2006</td>
<td>61,655</td>
<td>934.2</td>
</tr>
<tr>
<td>Futurescapes</td>
<td>32</td>
<td>RSPB</td>
<td>2010</td>
<td>24,461</td>
<td>764.4</td>
</tr>
<tr>
<td>Deer initiative</td>
<td>26</td>
<td>Deer Initiative Partnership</td>
<td>1995</td>
<td>19,792</td>
<td>761.2</td>
</tr>
<tr>
<td>RSPB Reserves</td>
<td>23</td>
<td>RSPB</td>
<td>1932</td>
<td>822</td>
<td>35.7</td>
</tr>
<tr>
<td>English NNR</td>
<td>22</td>
<td>Natural England</td>
<td>1981</td>
<td>664</td>
<td>30.2</td>
</tr>
<tr>
<td>Riverine Strategic River Restoration</td>
<td>19</td>
<td>Natural England</td>
<td>2008</td>
<td>588</td>
<td>30.9</td>
</tr>
<tr>
<td>Scottish NNR</td>
<td>18</td>
<td>Scottish Natural Heritage</td>
<td>1981</td>
<td>809</td>
<td>44.9</td>
</tr>
<tr>
<td>Landscape Partnership</td>
<td>17</td>
<td>HLF</td>
<td>2004</td>
<td>2,967</td>
<td>174.5</td>
</tr>
<tr>
<td>Community Forests</td>
<td>15</td>
<td>Forestry Commission</td>
<td>1990</td>
<td>12,313</td>
<td>820.9</td>
</tr>
<tr>
<td>National Trust Land</td>
<td>14</td>
<td>National Trust</td>
<td>1894</td>
<td>3,073</td>
<td>219.5</td>
</tr>
<tr>
<td>NIAS</td>
<td>12</td>
<td>Natural England</td>
<td>2012</td>
<td>6,181</td>
<td>515.1</td>
</tr>
<tr>
<td>Total number of initiatives</td>
<td>572</td>
<td>Total area served (km^2)</td>
<td>254,160</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Ecosystem service and community engagement objectives are not as frequently included, however. Environmental education objectives, despite being the second most commonly included category of objective in conservation programs in the UK, were still only present at a frequency less than half that of the wildlife and biodiversity category as only approximately 230 out of 758 initiatives included an environmental education objective (Eigenbrod et al, 2016). Furthermore, wider community engagement objectives, although the fourth most frequent category of objective, were included in just over 200 of 758 initiatives (Eigenbrod et al, 2016). Eigenbrod et al (2016) suggest that those involved with landscape-scale conservation feel that the larger-scale approach allows for an improved integration of varied objectives including habitat protection, heritage and social / economic elements. However, despite this potential for improved socio-ecological integration, some managers noted
trade-offs between different objectives, both because of inherent conflicts, for example between conservation and access, but also due to constraints on time and resources.

**Site selection and management**

The emphasis on habitats and species demonstrated in the examination of the objectives of landscape-scale programs is also evident with regard to site selection and management strategy; it is largely driven by habitat and ecosystem considerations (Eigenbrod et al, 2016). Furthermore, Eigenbrod et al (2016) state that “high levels of [Large Scale Conservation] activity appear to be correlated with existing protected areas, some threatened species and improved landscape character [which] suggests that conservation organisations are preferentially focusing on areas that are inherently ‘better’ from the point of view of both biodiversity and landscape,” (p 205). Essentially, the review emphasises, this trend could potentially be considered “a waste of resources” (Eigenbrod et al, p 205) as the ostensibly ‘neglected’ areas might require more work to become ecologically sound. Conversely, however, areas with existing designations are also likely to be the most ecologically intact areas and which contain priority habitats and species as well as environmental features of significance for conservation. Thus, given finite available resources, it is possible to contend that such areas should be prioritised. This challenge speaks to a larger trade-off in prioritising resources for conservation and is dealt with at the end of this section.

When examining data sources for site selection, data from the survey respondents in the study by Eigenbrod et al (2016) indicated that more than 40% of site selections and 60% of management strategies of the assessed landscape-scale conservation programs were informed by ecological data and assessments such as priority habitat and species data. However, the use of expert knowledge and advice to inform site selection and management was even more frequent, both from people internal and external to the organisation or partnership; indeed, expert advice or knowledge from folks internal to the organisation was used to inform site selection in 79% of initiatives that responded, and in 90% to inform management plans or actions (Eigenbrod et al, 2016). With regard to biophysical features, existing protected areas also played a key role in site selection as small protected areas within target zones were reported as a
common basis for selecting a landscape area. This is not unexpected as small protected areas often focus on specific habitats, species and ecosystems.

Hardly any of the initiatives demonstrated a truly integrated analysis of multiple types of data such as natural, physical or socio-economic data (Eigenbrod et al, 2016). With regard to the type of data employed to inform site selection or management strategy, floral or faunal distributions were quite common; over 60% of responding initiatives emphasised the use of surveys of species distributions (Eigenbrod et al, 2016). However, consideration for other aspects of the ecological network, such as connectivity, were less common. Eigenbrod et al (2016) state that frequently, organisational partnerships did not have access to pertinent information, nor did they have the means to employ and understand connectivity analyses in order to inform site selection or management strategy. Thus, despite the fact that close to 80% of initiatives indicated that the ecological network concept, including at least one of the components identified in Lawton’s report (Lawton et al, 2010), was taken into account in the spatial planning of the landscape area, the application of all the different components of an ecological network was less common with most initiatives emphasising core areas, habitat mosaics and restoration areas (Eigenbrod et al, 2016). Current or potential ecosystem service considerations were also less likely to feature in site selection and management strategies than habitat, species and ecosystem considerations; only 33% of respondents indicated that ecosystem services data informed their site selection or management strategy processes.

Activities and monitoring

Eigenbrod et al (2016) report that the types of programmes, interventions and/or activities connected with landscape-scale initiatives in the UK were overwhelmingly focused on actions around habitat creation and restoration or focus-area habitat or site management. However, there was substantial emphasis on community engagement as well. Though communication activities and engagement were a key part of the strategies in all initiatives, the methods and scale of resources targeted towards such efforts depended upon the objectives of the individual programmes. Also of note, engagement might include volunteers, but these volunteers were frequently engaged in surveying and/or monitoring the results of conservation actions, thus are not necessarily truly novel engagement. That is interesting
particularly as many initiatives, over 50%, stated that they were keen to measure the extent of engagement (Eigenbrod et al, 2016).

The activities and monitoring of landscape-scale initiatives in the UK focus, when monitoring occurs, on habitats and species according to Eigenbrod et al (2016). Furthermore, monitoring within initiatives was generally limited and patchy. Eigenbrod et al (2016) state that, apart from a few well-designed systems, initiatives varied with regard to the robustness of the sampling framework, frequency of monitoring and for various types of indicators. Furthermore, few initiatives implemented effective baselines or control areas. As a result of these monitoring issues, it is often not possible to compare different initiatives. Also, of note is that Eigenbrod et al (2016) reported that numerous respondents specifically voiced frustration with the “trendiness” (Eigenbrod et al, 2016, p 134) of the term ‘ecosystem services’, particularly identifying the difficulties involved with the realities of employing indicators to monitor the delivery of these services, especially over a large scale. The quality of any monitoring system is not further discussed here but mentioned as a means to provide understanding of the current features of landscape-scale conservation programs in the UK. The specific monitoring system of the NIA Initiative is discussed in detail in Section 5.3 and addressed in the context of recommendations in Section 7.2.

The NIA Initiative

So how does the NIA Initiative compare? The NIA Initiative, at the national level, was seeking to promote integrated management of landscapes in order to provide multiple benefits including biodiversity conservation and ecosystem service delivery as well as community engagement, although to a lesser extent, in the conservation process, as explored in Section 4.1. Indeed, of the seven national objectives detailed in Table 4.1, biodiversity conservation is a priority in three, but four address either ecosystem service delivery or community engagement, identifying them as priority objectives as well. Furthermore, the NIA Initiative, in its selection of areas, was also designed specifically to incorporate biodiversity, ecosystem service and community engagement objectives. This diverse focus in fact impacted the selection of the 12 successful areas, for example, through the inclusion of some areas with higher percentages of urban / suburban land-use as compared to other landscape designations as seen in Section 4.3. However, as discussed throughout this work,
most notably in Sections 5.2, 5.3, 6.1 and 6.2, the implementation, in the design of the monitoring system for example, and eventual outcomes of the program ultimately demonstrated far more emphasis on biodiversity conservation objectives rather than ecosystem service delivery or community engagement objectives.

What emerges then is that the NIA Initiative is different from many other landscape-scale conservation programs in its largely equal emphasis on biodiversity conservation as well as ecosystem service delivery and community engagement within its national objectives as discussed in Section 4.1. However, when exploring the implementation and management of the individual NIAs, most of the areas focused on existing protected areas which contain the most significant priority habitats and species as discussed in Section 4.3 using existing management strategies which varied in comprehensiveness as discussed in Sections 4.3 and 5.2. The NIA Initiative avoided some of the challenges in management strategy creation identified by Eigenbrod et al (2016) as a result of the competitive bid process which required a comprehensive business plan from each of the prospective NIAs detailing the data and decision processes behind the site design and management strategies of the areas (NIA 1). Public bodies also provided some support for the NIAs in an effort to facilitate better monitoring (NIA 1). However, the bid process also likely resulted in the exclusion of areas which lacked the resources to provide such detailed data and business plans, often areas with more informal partnerships which do not include a landscape-management body as a stakeholder as addressed in Sections 4.2 and 5.1; indeed, there was a discrepancy in the type of data sources and plans noted between areas with existing, formal partnerships in place and areas with more informal partnerships whereby areas with formal partnerships had more locally specific data and relied less on internal expert knowledge in the NIAs, as discussed in Section 5.3 of this work. However, even with the advent of national support and detailed business plans, there was an emphasis on habitats, species, ecosystems and existing protected areas in the site design and management plans of the NIAs as demonstrated throughout Chapters 4, 5 and 6 with far less consideration given to the delivery of ecosystem services at the local level so emphasised in the national NIA objectives (NIA 2).

Thus, while perhaps unusual in its equal emphasis on multiple objectives at the national level, the NIA Initiative still often focused its resources on core areas such as SSSIs as discussed in Section 4.2, often in places which overlap with other landscape-scale initiatives prioritising their resources in the same manner. It is essentially not very different in implementation to other landscape-scale initiatives.
and suffers from many of the same problems, for example in the design and implementation of the monitoring system, thus limiting measurable ecosystem service delivery and community engagement outputs or outcomes. It also failed to address trade-offs associated with the multiple objectives, both between biodiversity conservation and ecosystem service delivery but also in the larger context of prioritising resources for conservation. At the national level, NIAs which embodied varied land uses conducive to the delivery of certain ecosystem services were emphasised, for example the selection of NIAs with a larger percentage of area of built-up land use to encourage cultural services or community engagement in urban/suburban populations. At the individual NIA level, however, this can present certain trade-offs both with conservation as well as with other ecosystem services as detailed in Section 5.5. What emerges, then, is that the NIA Initiative sought to achieve a mixed focus on wild nature conservation, ecosystem service delivery and community engagement at a national level but the implementation of these objectives did not necessarily transfer effectively to local management. The consideration, or lack thereof, of trade-offs also speaks to the larger challenge touched on throughout this work of directing limited resources to make the most efficient use of those resources. One option is to focus on existing, established partnerships in areas of significant biodiversity value which might be able to implement on-the-ground actions more efficiently and effectively. The other option is to engage other areas where fragmented approaches might require additional resources initially to facilitate implementation, but which might provide key benefits to the ecological network in the longer term despite not necessarily appearing as valuable in terms of wild nature in the short-term. A discussion of who was involved in the NIA Initiative, both at national and local levels, follows in Section 7.1.2.

What then does the literature say about effective, integrated management for multiple objectives in a landscape-scale initiative? Despite many advances in managing landscapes for multiple benefits, that is biodiversity conservation and ecosystem service benefits, it is still challenging to shift away from broad statements regarding the value and benefits of nature to society to convincing, quantifiable estimations of values, particularly ecosystem service values (Nelson et al, 2009; UK NEA, 2011; MA, 2005; Balmford et al, 2002). A significant part of this challenge is the fact that biodiversity interacts with and has key functions at many different stages in the ecosystem service framework, both supporting ecological processes and as a final service or good (Mace et al, 2012), which can complicate monitoring strategies. Furthermore, while win-win situations that provide benefits for wild nature as well as
people are often cited as a key goal, as with the NIA Initiative, such situations are not necessarily as easy to obtain in practice (Tallis et al., 2008). As a result, without quantitative assessments, as well as incentives for landowners and the wider community to deliver them, these services are less likely to be prioritised when land-use and / or land-management decisions are taken (Nelson et al., 2009). This effect is likely amplified when attempted in newly formed ‘designations’ where existing data is incomplete, and expertise perhaps limited as is the case with some of the NIAs, discussed in Sections 5.3 and 6.1.

What then might be done differently to improve the achievement of the multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement sought by the Initiative and achieve the desired step-change in approach? The rest of this chapter deals with the recommendations for future endeavours similar in particulars to the NIA Initiative, as detailed in the introduction.

7.1.2 Engaging diverse partnerships of local people

This section provides context for the top-down approach ultimately emphasised by the NIA Initiative and then makes recommendations for a more bottom-up approach as put forth by Lawton et al. (2010). The review by Eigenbrod et al. (2016) identified 14 types of programs which oversee the majority of landscape-scale initiatives in the UK (572 out of 829), of which the NIA Initiative is one. Of the 14 largest programs, five programs in addition to the NIA Initiative (43%) were overseen by public bodies, four by Natural England (the NIA Initiative was overseen by Natural England) and one each by the Environment Agency (in conjunction with Natural England) and the Forestry Commission. A small number of public bodies were repeatedly involved with landscape programs in the UK, namely government agencies such as those three already touched on. Of note is that these public bodies made up only 7% of the 186 separate organisations involved in the assessed landscape-scale programs but they led 337 or 41% of initiatives.

What this demonstrates is a more top-down approach to conservation. Conservation approaches are considered top-down when driven by national governments (Abrams et al., 2008), among other institutions, as is the case with the NIA Initiative. Although the involvement of stakeholder groups could be considered a shift towards a more bottom-up approach, the emphasis in the NIA Initiative, as previously stated, is overwhelmingly on existing, formal partnerships which also facilitates a top-down
approach. Furthermore, the lead public body in many top-down approaches dictates the overall objectives of the Initiative; the objectives of programs, in many cases, form the targets which are then the basis of any assessment of success or otherwise. In applying for funding, as with the NIA Initiative, a program can require that successful applicants meet certain criteria or targets (Eigenbrod et al 2016). Ultimately, top-down approaches often perpetuate the predominant current approach to conservation instead of facilitating the desired step-change towards more novel approaches; as Brosius et al (2003) state in their book: “participation is relegated to the status of a managerial technique, in which the tools of conflict resolution are used to produce ‘consensus.’ It rarely offers local actors the resources and clout to change structural conditions that are the ultimate causes of environmental degradation” (p 43-44).

An alternative to the top-down approach is the bottom-up approach to conservation. Abrams et al (2008) assert that in developed nations such as the UK, bottom-up conservation arises from public awareness concerning user practices; thus, wider societal engagement in the conservation process is necessary for the step-change in approach which facilitates multiple, synergistic benefits for both wild nature and people (Lawton et al, 2010). However, research suggests that even so-called participatory processes are often merely indicative of a change not in actuality but merely in language; “At all political levels a big gap remains between the rhetoric on participation and the real-life implementation of participatory processes’ (Rauschmayer et al. in press),” (in Keulartz, 2009). This is ultimately true of the NIA Initiative; while the NIA Guidance Notes (NIA 1) promoted the idea of participatory process, the implementation ultimately resulted in a perpetuation of the existing system as discussed in Sections 5.1 and 6.2. In reality, it is necessary to manage conservation across scales, ideally fostering both horizontal and vertical collaboration amongst stakeholders, in other words governance which is initiated from the bottom-up and facilitates networks of stakeholders with links across different organisational levels (Berkes, 2007).

An important and overlooked challenge for the NIA Initiative in wider community engagement was variation in local context. In Systematic Conservation Planning, key stages in planning for conservation areas include understanding the context of the areas as well as the stakeholders and existing partnerships (Cowling and Pressey, 2003). As introduced in Section 4.2 and described throughout Chapters 4 through 6, the NIA Initiative did not take into account local context and the discrepancy in resources between areas with established, formal partnerships and those areas with informal or new partnerships. The local context significantly impacted an individual
NIA's approach to the implementation of the program, including how the NIAs addressed community engagement; areas often continued with existing strategies which focused on groups with which they were already engaged, as discussed in Sections 4.2 and 6.2. However, endeavours to promote community engagement should target many types of groups including people with diverse opinions as communities are not homogenous (Waylen et al, 2010).

One notable feature of the NIA Initiative is that it put less emphasis on private landowners at the national level (discussed in Section 4.2) than did the Lawton Report (Lawton et al, 2010). However, private landowners and managers, particularly farmers, are a key demographic of society in achieving the step-change in nature conservation (Lawton et al, 2010). Furthermore, many of the NIAs discussed engaging landowners and managers at the local level, as explored in Section 4.2. The UK is now transitioning from the Countryside Stewardship Scheme discussed in Section 4.1 to the Environmental Land Management scheme (ELMs) ostensibly as a means to better engage landowners and managers. The ELM scheme is intended to address many of the problems with the CSS approach (Defra, 2018a). The new approach is formulated around the concept of public money in return for the provision of public goods, which covers a range of ecosystem services from clean air and water to wild nature (Defra, 2018a). A key feature of the approach is wider community engagement and facilitating understanding of the services nature provides, namely “providing public access to their land and contributing to the public’s understanding and enjoyment of nature. We will also look at specific incentives to increase access for disabled or disadvantaged groups,” (Defra, 2018a). Landowners and managers have a key role to play in facilitating wider community engagement and achieving the step-change in approach to nature conservation.

Recommendations:

-A program should consider management context throughout the design and implementation process; areas with informal or without existing partnerships are likely to need more support to set up. Management context impacts the design and implementation of landscape programs at local levels and ultimately the success or otherwise of the undertaking. There are both benefits and drawbacks to focusing on areas with existing, formal partnerships in place. Existing partnerships are beneficial in that creating effective partnerships and relationships is not instantaneous and a well-coordinated partnership enables faster, more effective implementation and
potentially a more efficient use of resources. Furthermore, strong partnerships can offer a clear vision for an initiative which guides strategic decisions. However, existing partnerships may continue with their existing approaches thereby limiting flexibility and the capacity to adapt to new opportunities and challenges. Furthermore, emphasising formal partnerships may limit the improvement of ecological networks in areas without existing partnerships or with less formal partnerships, areas which might contribute in important ways to the ecological network.

**Future landscape-scale programs should endeavour to promote wider community engagement in wild nature conservation by involving all types groups throughout the design and implementation process, particularly by facilitating the development of new partnerships in areas without cohesive landscape approaches.** Communication and wider community engagement are essential for achieving the step-change in nature conservation. Promoting local understanding and investment in an initiative are essential to facilitate community engagement and create support. Furthermore, it takes time in order to understand the various perspectives of local people, landowners and groups and to develop effective relationships. For people to engage, it is necessary that objectives be communicated in a way which appeals to their values and interests and which makes sense to them. Different types or forms of communication are likely to be needed to effectively communicate and engage with various audiences. Finally, regular feedback is essential so that initiatives can retain existing and encourage new community support.

### 7.2 Objectives and monitoring: measuring success

One particular challenge for the NIA Initiative was the lack of clear objectives in the program, discussed in Sections 5.2, 5.3 and 6.4, and the resulting variation in motivations between the national, stated objectives of the Initiative and the motivations of the local areas, discussed throughout Chapters 4-6. This section examines the framing of objectives at both the national and local levels, explores the disconnect between them, inspects the literature on the importance of clear objectives in conservation initiatives, and finally, ends with the recommendation for future programs.

As illustrated in Section 4.1, the major motivations of the NIA Initiative at the national level encompassed multiple objectives, namely biodiversity conservation, ecosystem
service and community engagement objectives although the community engagement objectives were less clearly stated, as discussed in Section 5.3. At the local level, however, particularly throughout the implementation and assessment of outcomes, the emphasis was largely on the biodiversity conservation objectives, as addressed in Section 6.1. This speaks to a clear disconnect between national and local motivations. Additionally, the focus on biodiversity conservation was further enhanced by the inadequacy of the monitoring system, particularly with regard to ecosystem service measurement, as discussed in Section 5.3 and 6.1. This disconnect is perhaps best illustrated by understanding how the approach to conservation of wild nature has evolved in modern times as discussed in Mace (2014). These shifts, according to Mace (2014) are largely a feature of how the relationships between wild nature and people are seen and addressed.

Mace (2014) contends that there are four key phases in the modern framing of conservation, considered to be from the 1960s through to the present, which are as follows:

- **1960s-1970s:** “nature for itself” (Mace, 2014, p 1558) where wilderness and intact natural habitats are prioritised and safeguarded from the impacts of people. This approach emphasises species conservation and protected area management, concepts in landscape management which remain important to the present day;

- **1980s-1990s:** “nature despite people” (Mace, 2014, p 1558) where the emphasis is on the threats to nature as a result of anthropogenic activities such as habitat destruction, overharvesting or the introduction of invasive species. The focus is on strategies to limit or remove such threats using considerations such as minimum viable population sizes or sustainable harvesting levels and strategies such as community-based management approaches.

- **2000-2005:** “nature for people” (Mace, 2014, p 1558) focused on integrated ecosystem management to achieve sustained benefits for humans through the delivery of ecosystem goods and services. This framing promoted the idea that people were part of natural systems and not separate units. The Millennium Ecosystem Assessment (2005) was a crucial force in the promotion of this framing and thus it was quickly adopted into conservation policy, for example the UK NEA (2011) in the United Kingdom. It emphasises a very utilitarian approach whereby nature is managed in order to maximise benefits for people.
2010-present: “people and nature” (Mace, 2014, p 1559) takes the concept of benefits for people derived from natural systems a step further towards a more nuanced framing which promotes the benefits of sustainable and resilient interactions between people and wild nature. This framing operates at a range of scales and emphasises the importance of understanding social-ecological systems in achieving the desired interactions between people and nature.

So how does the NIA Initiative sit within this chronicle of conservation framings? This is best explored by examining the design as demonstrated by the goals of the Initiative and implementation at both national and local levels. To recap, the goals of the NIA Initiative are as follows:

1) “Opportunities to deliver ecological networks, both in terms of large area and scale and valuable benefits to wildlife and people, are particularly high;
2) A shared vision for the natural environment exists among a wide partnership of local people, including statutory and voluntary sectors;
3) Significant improvements to the ecological network can be achieved over large areas by enlarging and enhancing existing wildlife sites, improving ecological connectivity and creating new sites;
4) The surrounding land use can be better integrated with valued landscapes and action to restore wildlife habits and underpinning natural processes, helping to adapt to climate change impacts.
5) Benefits to urban area and communities can be achieved and, where appropriate, NIAs may contain urban areas as part of an enhanced ecological network;
6) ‘Win-win’ opportunities are identified and have the potential to be exploited to the full to derive multiple benefits, for example with benefits for the water environment and Water Framework Directive objectives, flood and coastal erosion risk management and the low-carbon economy;
7) There are opportunities to inspire people through an enhanced experience of the outside world,” (NIA 1, p 5).
The NIA Initiative objectives embody features of all four framings, but perhaps most significantly of the “people and nature” framings, as presented in Figure 7.1.

Figure 7.1 A demonstration of how the NIA Initiative fits in Mace’s (2014) rough timeline of modern (post-1960) conservation framings.

Source: Developed by author from Mace (2014) with objectives from NIA Guidance Notes (NIA 1) and NIA Criteria (NIA 2).

The Initiative emphasises wildlife sites as core spaces for nature, as seen in Objective 3 above, which exemplifies features of the protected area concept, a focus of the “nature for itself” framing. In fact, these wildlife sites form the central means to designate space for nature in the NIA Initiative; the core areas are the basis of the ecological network on which the NIA wildlife conservation approach is structured. The Initiative further emphasises removing threats, as in Objective 4 where surrounding land should be “better integrated” with the core sites, thus limiting pressures such as habitat destruction or pollution, a key feature of the “nature despite people” framing. Ecosystem services and sustainable land management are also key to the NIA Initiative, as seen in Objective 6, an important concept for the “nature for people” framing. However, the Initiative most clearly emphasises benefits for “people and nature” as in Objectives 1, 2, 5, 6 and 7, including focusing on win-wins for both ecosystem service delivery and biodiversity, a key, foundational concept of which is the interaction between local communities and their local, natural environments. Engaging local people and communities in nature conservation and encouraging them to value and protect nature both for its intrinsic features as well as the services it provides is an important aspect of the desired step-change sought by both the Lawton Report (Lawton et al, 2010) on which the NIA Initiative is based and the NIA
Initiative itself. The NIA goals also emphasise adaptability, as in Objective 4, another core concept of the “people and nature” framing.

This mix of features from the four framing categories seen within the NIA Initiative is not unexpected as, in reality, the shifts in approach to the framing of conservation have happened rapidly over a brief time frame leading to, potentially, a diversity of views, values and motivations within any single program. Thus, current approaches such as the NIA Initiative, as demonstrated, might embody features of several different framings. However, the two most significant framings seen within the NIA Initiative, “nature for itself” and “people and nature” are not necessarily as dissimilar as might be expected according to Mace (2014). Both framings can incorporate people’s expectations and aspirations for the natural environment in which they seek to exist and which they seek to leave for future generations. However, “people and nature” integrates with policy more effectively as it has a wider focus. The challenge with the “people and nature” approach, the predominant focus of the NIA Initiative, however, is that it does not lend itself as well to the analytical basis of the previous framings, which allowed them to be quantifiable as well as deliverable (Mace, 2014).

What does Mace (2014) mean by the lack of analytical foundations in the “people and nature” framing? Mace (2014) identifies three considerations with the “people and nature” framing, which are as follows:

1) It is difficult to characterise or measure a “people and nature” framing as it is a multi-layered and multidimensional relationship.
2) The “people and nature” framing emphasises the importance of form, function, adaptability, and resilience in natural systems, but these terms mean different things in social versus ecological systems. In ecological systems, these concepts operate over different spaces on different timescales and may not necessarily be responsive to human management strategies.
3) Conservationists can be dismissive of attempts to put a monetary value on any or all aspects of nature but if natural systems are excluded from such economic dialogues, they will likely continue being treated as if they have limited or no value, thus allowing existing trends in the state of nature to persist.

Indeed, these considerations highlight some of the major problems encountered by the NIA Initiative which ultimately limited its effectiveness in terms of long-term conservation or socio-ecological impacts. As discussed in Chapter 5, there was far
more emphasis on biodiversity indicators in the NIA Monitoring System as compared to ecosystem service indicators. Furthermore, almost all the biodiversity indicators were habitat and species indicators, harking back to the “nature for itself” framing under which, as Mace (2014) states “conservation success can be measured with well-established metrics” (p 1559). Far fewer indicators, just 17%, dealt with the “people and nature” relationship despite its overwhelming presence in the stated NIA objectives and even fewer conclusions could be drawn about the desired step-change in societal perceptions of their local environments beyond that the community engagement was limited to certain groups as assessed in Chapter 6.

Furthermore, despite the intention of operating over a large scale and supposedly longer time-frame, the NIA Initiative was ultimately delivered as a pilot scheme, implemented over a period of three years and, while operating at a landscape scale, has, according to monitoring data, delivered moderate benefits in specific locations, again as seen in Chapter 6. Any achievements, for example, in terms of ecological network form, ecosystem function and the adaptability or resilience of those natural systems, which are likely to be limited in any case as a result of the short management period of the Initiative, will not be seen for many years assuming that monitoring continues, which is not at all certain.

Finally, Silvertown (2015) addresses the third consideration, the challenges associated with putting a monetary value on ecosystem services to engage people, ultimately stating that the “[ecosystem service] paradigm has constrained thought, particularly towards the monetization and financialization of nature, even when many ecologists and others oppose this trend,” (p 1). He suggests that the problem with the ecosystem service paradigm is its anthropocentrism and that, while monetising nature may make sense in certain situations, “it is possible to use the concept of [ecosystem services] in a more nuanced way to build upon the moral case for biodiversity conservation and not to displace or devalue it by monetization,” (p 7). Silvertown’s (2015) work again emphasises the importance of the relationship between people and nature in framing an approach to conservation and highlights the focus in the NIA Initiative at the national level on demonstrating the value of ecosystem services to people.

These three considerations further illustrate the disconnect between the national framing emphasis on “people and nature” and the local emphasis. As discussed in Section 5.2, there is an inconsistency in the framing of objectives at the individual NIA level with regard to the biodiversity conservation, ecosystem service and community
engagement objectives. While all 12 of the NIAs have clear conservation objectives and targets, ecosystem service delivery is inconsistently presented as a priority objective. In fact, five of the NIAs frame their approach so that improved space for wild nature is the primary objective for their activities, thus predominantly demonstrating the “nature for itself” framing. In the other seven NIAs, however, their objectives are framed so as to suggest that their approach is focused on socio-economic benefits that result from the improvement of ecological systems and with significant consideration for benefits for people as well as wild nature, in other words a “nature for people” framing. In practice, though, as discussed in Section 6.1, biodiversity conservation was generally prioritised over ecosystem service delivery or community engagement at the local level. This speaks to a disconnect between national and local objectives that was first identified in Section 4.1. Furthermore, the lack of clear, measurable objectives at the national level also likely contributed to the problems with the monitoring system, as discussed in Section 5.3, and the lack of measurable outputs, addressed in Chapter 6.

Clear program-level objectives are necessary for the success of a conservation initiative, particularly one which embodies multiple purposes as the NIA Initiative does. In Systematic Conservation Planning, a widely respected approach for identifying and protecting priority spaces for conservation purposes (Margules and Pressey, 2000; Knight, Cowling and Campbell, 2006; Pressey and Bottrill, 2009; Knight et al, 2010; Sarkar and Illoldi-Rangel, 2010; Kukkala and Moilanen, 2013), a key step in the process is to identify “specific, preferably quantitative, targets for operational use,” (Margules and Pressey, 2000). It is not merely identifying habitats or species of concern but actions for implementation (Brown et al, 2015). These targets enable the clear identification of the contributions of projects or areas to goals, in other words impact evaluation (Baylis et al, 2016), and allow for assessing the conservation significance or value of diverse spaces (Margules and Pressey, 2000).

Furthermore, it enables an understanding of the value of the investment in the initiative, something which Ferraro and Pattanayak (2006) argue should be an important feature of an initiative’s design and implementation process; “We cannot learn from thousands of projects if none of these projects is designed in a way that permits an evaluation of its effectiveness,” (Ferraro and Pattanayak, 2006, p 0487). While target-based approaches are not without criticisms (Soulé and Sanjayan, 1998; Agardy et al. 2003; Woinarski et al, 2007), Cawardine et al (2009) suggest that a “review of the published literature would suggest that the use of targets in conservation planning is internationally accepted as best practice (Pressey et al.
Recommendations:

It is important to have clear objectives which are measurable and implemented effectively across scales so as to avoid a disconnect between national and local priorities. A lack of clear objectives for the multiple purposes of the NIA Initiative and a disconnect between the national and local approaches to wild nature conservation hampered the success of the NIA Initiative. Future endeavours should clarify their objectives which can then inform other aspects of the program such as monitoring.

Monitoring of landscape-scale programs is essential; clear indicators should be developed for all stated program objectives. Monitoring should effectively measure all objectives, first by establishing a baseline from which to assess the impact of an intervention and then continuing for a period that is, at a minimum, long enough to determine the ecological effectiveness or otherwise of the program. Monitoring in national programs should also take into consideration the variation and limitations in data and expertise in existence at the local level. Effective monitoring can then provide data for future adaptation as well as new programs.

7.3 Looking to the future: the impact of funding

This last section examines the NIA Initiative in the context of two other landscape-scale conservation programs by exploring features including the program size, funding structure and implementation period. It then explores the success of the NIA Initiatives in achieving additional funding since 2015, the end of the funded period. Finally, it makes recommendations for how a similar program might be more effectively implemented in the future, again given the constraints of the original program with regard time and funding.

7.3.1 Landscape-scale funding

The NIA Initiative provided £7.5 million to be divided between up to 12 individual areas over three years to pursue the national objectives. This was to be complemented by other sources of funding, which all NIAs achieved to varying degrees, as
demonstrated in Section 4.6. How then does the NIA Initiative with regard to scale and funding compare to other similar landscape-scale programs? Two other programs were chosen for comparison; the EU Endangered Landscapes Program and the RSPB’s Futurescapes program, which share similar objectives and operate at landscape scales. There are many examples of programs similar to the NIA Initiative in these particulars, but these two programs are considered to provide acceptable comparisons based on the relevant features. Both are detailed here in the following paragraphs.

The EU Endangered Landscapes Program (ELP) is focused on European landscapes and seeks to reverse biodiversity loss while “providing inspiration for a fundamental shift in the policy and practice of nature conservation” (ELP, 2019, website). It has biodiversity, ecosystem service and community engagement goals, although the ecosystem service objectives are not overtly stated in the broad objectives:

- “Support viable populations of native species with capacity for landscape-scale movement;
- Provide space for the natural functioning of ecological processes, so reducing or even eliminating the need for intensive management;
- Are resilient to short and longer-term change (such as climate fluctuations);
- Provide sustainable cultural, social and economic benefits to people,” (ELP, 2019, website).

The ELP program provides two types of grants: Project Innovation Grants intended for scoping and planning of novel programmes which could be up to the sum of $100,000 in value and Project Implementation Grants which provide for the execution of the initiatives and are in the range of $2 - $5 million. Innovation grants last up to two years while implementation grants have a maximum duration of five years. As for the flexibility of the funding, there is evidence of flexibility in major objectives and individual projects. The strategy discusses “Building capacity nationally and locally, by facilitating the transfer of skills and know-how between individuals and institutions,” (ELP, 2019, website), but this flexibility is generally targeted towards specific groups and does not necessarily provide for significant wider community engagement. There is no clear definition of what a landscape is considered to be with regard to size. This is not unexpected as there is no widely accepted numerical definition of a landscape. However, the grants fund one landscape-scale project and of the projects which have thus far been funded (there are eight, two of which are in the UK, as of October 2019), the target areas range in size from 900 hectares (as part of a pilot project) to 1.4
million hectares. It should be noted, however, that the target areas are the landscapes; the actual work within them often focuses on core areas which are smaller in size. Furthermore, most (five) landscapes fall between 10,000 and 200,000 hectares in size. Some projects also include a marine component and one is entirely marine-based. Projects are generally collaborations between various stakeholders which sometimes cross international borders. Each project has associated targets and, often, core sites for restoration. Furthermore, each project is considered with the future in mind; the program seeks, as it states in its Vision (ELP, 2017) document, not to merely to restore against specified targets but “supports a programme of work that creates the conditions for landscape recovery including through capacity development, institutional strengthening, learning and knowledge-exchange, network development, impact assessment, good governance and engagement of stakeholders and decision-makers,” (p 6) in order to promote “more resilient, and more self-sustaining” (p 6) natural systems.

The RSPB also had a landscape-scale initiative called Futurescapes which was launched in 2010 (Eigenbrod et al, 2016). The focus of the Futurescapes project is largely on wild nature and restoring dwindling habitats. However, the program also recognises ecosystem service delivery and economic benefits (RSPB, 2001; RSPB, 2010). The report by Eigenbrod et al (2016) included 32 Futurescapes initiatives which cover 24,461 square kilometres or 2,446,100 hectares; that would indicate an average initiative size of approximately 77,091 hectares. The Futurescapes program was developed as an EU Life funded program intended to focus on 38 priority areas around the UK covering 2.2 million hectares (EU Life Project, 2015; Eigenbrod et al, 2016). However, additional funding was also sourced. According to the EU Life project website, the initial bid provided €3.8 million; furthermore, “the project helped to raise €40.3 million for conservation delivery and €112.6 million for all other aspects of landscape-scale conservation,” (EU Life Project, 2015). The project was developed as a long-term endeavour which is still ongoing; Eigenbrod et al (2016) describe it as “dynamic and still actively introducing new initiatives” (p 61).

When specifically comparing these two programs to the NIA Initiative, what becomes apparent is that, for the scale at which the NIA Initiative operated, it was quite a small amount of funding per landscape area. The NIA Initiative provided approximately £625,000 to each area when the £7.5 million is divided evenly between the 12 areas and the areas pulled in an additional, approximately £8.1 million in cash distributed unevenly between the NIAs and which favours existing partnerships with a landscape-scale management partner as a stakeholder as shown in Figure 4.11. This is
compared to the ELP, which provides millions of pounds for a single landscape area over five years as well as, potentially, additional time and funding for a two-year scoping study prior to the implementation of a project. Furthermore, the RSPB Futurescapes programs had significantly more investment initially and continues with support to this day. This discrepancy particularly lends itself to a discussion regarding funding for landscape-scale initiatives in general but also core funding specifically. The costs of implementing conservation interventions is still developing as a field, perhaps because, as Naidoo et al (2006), “systematic conservation planning was developed by biologists, and most biologists have neither been trained to consider economic concepts such as cost effectiveness nor to collect relevant economic data,” (p 685). It is important to consider all aspects of the cost of an effective intervention.

The challenge of funding was noted by Eigenbrod et al (2016) in their review of landscape-scale programs in the UK. “One important issue that emerged from the survey and interviews is that it is not just physical conservation management that needs sustained funding. Funding is also needed for facilitation, coordination and communication, particularly in projects with large or complex groups of partners and stakeholders; and greater investment is needed in long-term monitoring of environmental and other benefits of LSC.” (Eigenbrod et al, 2016, p 34). Eigenbrod et al (2016) note that funding approaches or patterns have profound impacts on landscape-scale initiatives. Two broad challenges are identified. The first challenge is that funding for landscape-scale initiatives is often of a short-term nature and, as a result, restricts long-term conservation visions. The second challenge is that program priorities are often shaped by the priorities of the funding organisations and this can constrain or direct conservation goals. Eigenbrod et al (2016) sum this point up by stating “flexible funding sources are rare but are extremely valuable,” (p 171). One potential aspect of flexible funding that should be acknowledged is core funding.

Core funding essentially provides flexible financial resource that allows organisations to address key business costs (IVAR, 2013). Core funding can include money for staff salaries as well as fundraising costs, resources for communications and / or digital innovation or monitoring and evaluation. Many different organisations have acknowledged the benefits of core funding (Institute for Voluntary Action Research, 2013; Washbourne et al, 2019), including the Esmée Fairbairn Foundation quite recently in their report Insights on Core Funding (Esmée Fairbairn, 2019). Core funding has many advantages including the means to adapt, evolve and innovate as an organisation. However, one of the major impacts on the power of funding, even flexible or core funding, is time; short grant periods of a few years can make it difficult
to retain staff or truly provide much relief from focusing on areas other than fundraising (Esmée Fairbairn, 2019), something which the NIAs noted (CEP, 2015a) and which was touched on with regard to the overall timeframe of the program in Section 5.1.

One of the main successes of the NIA Initiative as described by a number of the NIAs in the interviews was the flexible funding. Flexibility of funding was emphasised by six individual NIAs as a very successful feature of the Initiative as discussed in Section 4.5. As one NIA said of the Initiative “It was quite innovative,” then continuing speaking of a specific project as an example “It was a good project because it probably would have sat there for another 10 or 15 years looking for funding to get it done,” (NIA i). Other NIAs echoed this sentiment, stating that without flexible funding, “some of the more innovative or risky [projects] probably wouldn’t have been pursued, I think,” (NIA vi). A third NIA also affirmed the importance of flexibility in implementing more ‘risky’ projects: “We locked in lots of high-risk specs into the [specific NIA] one, because we saw them as- that they were, actually, probably- that we had the impetus…So, we didn’t go safe at all. So, there were projects that if we got the impetus of that three-year funding behind us and all the kind of, all the partners, we were more likely to crack them at that time than any point previously or in the future. So, we didn’t kind of load our projects or programme with safe projects by any means,” (NIA v).

Two other NIAs specifically mentioned the ability to include projects about the arts and community engagement, the first stating that “We had a priority about communication, we wanted to say, ‘Look, there’s no point in us trying to do all this if we can’t communicate.’ So, we had an element in the business plan which was called [specific project]. So that could be anything from a physical thing, like a sign or an enclosed area where it will tell you what you’re seeing in front of you, to events, to publications, to community things. So, it was all about just telling the story. In fact, we even built an arts project,” (NIA x). A second NIA also emphasised the arts, stating “[One partner] have almost taken the whole ethos of the Nature Improvement Area right to the core of their strategy and they’ve said, ‘Okay, let’s develop some funding bids from arts work.’ They’ve done two different projects so far based around the Nature Improvement Area, two different arts projects, theatre projects,” (NIA viii).

However, the flexibility extended to other forms of community engagement as well, as the same NIA pointed out: “One of the new things that Nature Improvement Area allowed us to do was not just to focus on [specific habitat] or [second specific habitat],
but to try to take a bit more of a whole farm approach in working with the landowner on a range of different environmental benefits on the land,” (NIA viii). Essentially, flexibility in funding, the ability to focus on projects other than pure conservation work, was seen as a key benefit of the Nature Improvement Area Initiative and important for the desired ‘step-change’. As one NIA sums it up, “We had different areas of work. We had our conservation, our on the ground practical on the ground conservation. We had a big area of community and education work and we had a big area of research work. A lot of the research we did, we did work on landscape permeability. We did some work on visitor management and we did some work on climate change. All of those things are actually quite difficult to get funding for in the normal course of things. It’s often easier for the conservation stuff in a way because if it’s practical they can see what they’re getting. To have a fund that will do both is quite unusual,” (NIA iv).

Despite the flexible funding, however, the short timeframe of the Initiative and scale of the projects relative to the available funding, particularly given the lack of consideration for the management contexts of the individual areas, really limited the NIA Initiative in achieving its stated national outcomes, particularly with regard to wider community engagement and the desired step-change in approach. Furthermore, NIAs with informal or new partnerships prior to the NIA Initiative spoke of the challenge in setting up their partnerships in Section 5.1, for example, in the rush of implementation. How, then, have the NIAs fared since the end of the funded period in 2015?

7.3.2 The future of the NIAs

This section explores the future of the NIAs, specifically examining the success or otherwise of attracting additional funding for the NIAs since the end of the original funded period in 2015. It does this using a mixture of data from the semi-structured interviews as well as secondary data derived from document analysis of the Final Monitoring and Evaluation Report (CEP, 2015a) and final best practice even (see Table 3.2) as well as other data from the individual NIAs.

The most significant factor in the continuation of the NIAs is considered to be financial support; without funding, the landscape-scale programs are unlikely to be able to continue to operate in the same form, or indeed in any capacity. The NIAs were funded for a three-year period, from 2012-2015, after which they were expected to be
self-sufficient with regard to financial support. The Final Monitoring and Evaluation Report (CEP, 2015a) provided data on whether or not the individual NIAs had secured additional funding as of that date, namely November 2015. This work builds on that foundation, exploring what major and moderate funding individual NIAs have secured in the three years since that time through the end of 2018.

The work was complicated by the fact that the individual NIAs are not necessarily continuing to use the designation ‘Nature Improvement Area’; often, particularly in the case of the areas with existing designations, the areas use different titles associated with the landscape area in which they operate. Funding was investigated by visiting the websites for the individual NIAs (if they still existed), searching the websites of the lead body or partnership of the individual NIAs for past, ongoing or upcoming projects and examining presentations from the individual NIAs conducted at the last ‘Best practice’ event in London on the 23rd of February 2016. This list is not intended to be exhaustive but to provide an overall indication of the success of the NIAs, both in general and individually by management category, in achieving ongoing support by identifying important sources of funding. To that end, the analysis is concerned more with the type than with the number of funding sources or their exact monetary value although aspects all are considered. The results are provided in **Table 7.2**.
Table 7.2 A table of funding type and source realised by the individual NIAs during the period from 2015 to 2019.

<table>
<thead>
<tr>
<th>Management Group 1</th>
<th>NIA</th>
<th>Funding</th>
<th>Funding sources</th>
<th>Funding Category (in £s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Peak</td>
<td>Funding to continue aspects of work</td>
<td>LIFE+ and 3 utility companies (1).</td>
<td>Millions</td>
<td></td>
</tr>
<tr>
<td>Morecambe Bay</td>
<td>Funding to continue aspects of work</td>
<td>HLF (Landscape Partnership); Countryside Stewardship Facilitation Fund; Catchment Restoration Fund; DEFRA; WREN (2).</td>
<td>Millions</td>
<td></td>
</tr>
<tr>
<td>South Downs</td>
<td>Funding to continue aspects of work</td>
<td>HLF; Countryside Stewardship Scheme Facilitation Fund (3).</td>
<td>Millions</td>
<td></td>
</tr>
<tr>
<td>Wild Purbeck</td>
<td>Funding to continue aspects of work</td>
<td>HLF (Landscape Partnership); Section 106 agreement; Health &amp; Wellbeing Legacy Fund; British Gas Healthy Homes (4).</td>
<td>Millions</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management Group 2</th>
<th>NIA</th>
<th>Funding</th>
<th>Funding sources</th>
<th>Funding Category (in £s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dearne Valley</td>
<td>Initial funding allowed NIA to continue for 1 year; funding to continue aspects of work after.</td>
<td>HLF (Landscape Partnership) (5).</td>
<td>Millions</td>
<td></td>
</tr>
<tr>
<td>Humberhead Levels</td>
<td>Funding to continue aspects of work</td>
<td>LIFE+; HLF (Landscape Partnership); WREN; Countryside Stewardship Scheme Facilitation Fund; Catchment Based Approach (CaBA); Natural England; North Lincolnshire Council; Habitat Aid (6).</td>
<td>Millions</td>
<td></td>
</tr>
<tr>
<td>Meres and Mosses</td>
<td>Funding to continue aspects of work</td>
<td>HLF (Landscape Partnership); LIFE (7).</td>
<td>Millions</td>
<td></td>
</tr>
<tr>
<td>Northern Devon</td>
<td>Funding to continue aspects of work</td>
<td>Interreg; Countryside Stewardship Scheme Facilitation Fund; Biffa; Natural England; Environment Agency; Devon County Council (8).</td>
<td>Hundreds of thousands</td>
<td></td>
</tr>
<tr>
<td>Birmingham and the Black Country</td>
<td>Funding to continue work</td>
<td>Esmee Fairbairn; HLF (not Landscape Partnership) (9).</td>
<td>Hundreds of thousands</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Management Group 3</th>
<th>NIA</th>
<th>Funding</th>
<th>Funding sources</th>
<th>Funding Category (in £s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greater Thames Marshes</td>
<td>Funding to continue aspects of work</td>
<td>European Maritime and Fisheries Fund; Environment Agency; Calouste Gulbenkian Foundation (UK Branch); Oak Foundation (10).</td>
<td>Hundreds of thousands</td>
<td></td>
</tr>
<tr>
<td>Marlborough Downs</td>
<td>Funding to continue aspects of work</td>
<td>Natural England; Wiltshire Community Foundation (11).</td>
<td>Hundreds of thousands</td>
<td></td>
</tr>
<tr>
<td>Nene Valley</td>
<td>Funding to continue aspects of work</td>
<td>HLF (Landscape Partnership) (12).</td>
<td>Millions</td>
<td></td>
</tr>
</tbody>
</table>

3) SD BPNE, 2016 in NIA 3; South Downs Nation Park Website, accessed 15/03/2019 from: https://www.southdowns.gov.uk/care-for/heathland/heathlands-reunited/
4) WP BPNE, 2016 in NIA 3; Dorset AONB Website, accessed 15/03/2019 from: https://www.dorsetaonb.org.uk/south-dorset-ridgeway-partnership
5) DV BPNE, 2016 in NIA 3; Dearne Valley Landscape Partnership Website, accessed 15/03/2019 from: http://discoverdeanne.org.uk/about/
6) HL BPNE, 2016 in NIA 3; Yorkshire Wildlife Trust Website, accessed 15/03/2019 from: https://www.ywt.org.uk/wildlife/conservation-action
7) MM BPNE, 2016 in NIA 3; Meres and Mosses Website, accessed 15/03/2019 from: http://www.themeressandmosses.co.uk/
8) ND BPNE, 2016 in NIA 3; Devon Wildlife Trust Website, accessed 15/03/2019 from: https://www.devonwildlifetrust.org/what-we-do/our-projects/
12) NV BPNE, 2016 in NIA 3; River Nene Regional Park Website, accessed 15/03/2019 from: https://www.rivernenergionalpark.org/projects/nenescape-landscape-partnership-scheme/

Source: Author's own derived from a variety of sources which are listed below the table.

All 12 NIAs have achieved funding to continue with certain aspects of the original, national NIA Initiative objectives. However, there is some divergence in the types and quantity of sources of the funding that different NIAs have secured, largely along the line of the management contexts of the individual areas. NIAs with established partnerships seem more diversified in funding sources and often have financial support from large, sometimes even EU programs. In contrast, NIAs with less formal partnerships tend to have smaller-scale funding from fewer sources. This is likely a result of the complexity of larger-scale funding programs which is difficult for areas with less established partnerships to facilitate, potentially either in terms of resources or evidence. For instance, HLF and European funding often involves complex and lengthy bid processes (Eigenbrod et al, 2016).

A number of the NIAs discussed the challenge of sourcing additional funding and the impact of management context, as discussed in Section 4.6. The specific case of Greater Thames Marshes is presented here as an example of an NIA with a less-formal partnership and the difficulties it experienced with funding despite the fact that longer-term funding was a major priority of the NIA as outlined in its original Business
Plan identified in Table 3.2 (GTM BP). The Respondent had this to say on the subject of funding:

“So finally, our fifth area of projects was what we called Legacy. We heavily invested in saying, ‘This project only lasts three years. What we really want to do is try and find big funding pots to carry on work.’ So, we actually put aside £100,000 of the £575,000, which we thought would pay for three big bids for money and it’s been a real struggle actually to be successful. So, we went to Europe and we went for an INTERREG programme for a thing called Waste to Working. So, working on the waste sites, carrying on that Thames Terrace Invertebrate stuff. Went to Europe and that got pushed back and they said, that wasn’t they sort of thing they wanted. We did a Heritage Lottery Landscape Partnership bid for the South Essex Marshes. That was unsuccessful. I mean that was so frustrating. We did a huge amount of work to try and say, ‘These marshes will all be part of a big landscape,’ and we didn’t get the money for that. We’ve done two bids with Thames Estuary Partnership. One was a LIFE bid, European LIFE bid and the other one was a Horizon 2020 bid. We were unsuccessful and we had one and we’re still waiting on the other. So unfortunately, out of those four bids we’ve still got one to wait for. They vary in value. They can be a £1m bids. So, if we get one bid we will have got our money back. At the moment it’s not looking great. That’s all terribly sad,” (Greater Thames Marshes, Interview).

The Respondent continued explaining what was understood to be a significant reason the bids were unsuccessful: “When I applied for the Heritage Lottery Funding for the landscape partnership bid for the South Essex Marshes, one reason we didn’t get the funding is they weren’t confident about our partnership,” (Greater Thames Marshes, Interview). In other words, management context is understood to be an important aspect of accessing funding, particularly larger-scale funding. Having a less-formal partnership is perceived as a disadvantage; this was true throughout the implementation of the NIA Initiative but also since the end of the funded period in 2015.

Recommendations:

Programs should facilitate a longer-term approach even with short-term initiatives; true landscape-scale conservation which works towards a desired step-change in the current approach to conservation is a long-term process. Ideally, programs need to be maintained over longer time frames, perhaps on the order of decades, in order to make real gains in conservation. However, this is not
always possible. Thus, programs such as the NIA Initiative should facilitate strategies that can be maintained beyond the initial funded period of the program, particularly in terms of monitoring. One option might be a scoping period prior to the start of a program such as that exemplified by the ELP, a period in which monitoring strategies might be initiated. Another option is greater investment in a smaller number of areas; instead of £7.5 million for 12 areas, it might instead be invested in three.

Programs should maintain flexible funding; flexible funding is important as it enables the pursuit of integrated programs and a means to address multiple aspects of social-ecological systems. Core funding is a key feature of flexible funding and is particularly important for areas which are new or more informal and which might need more assistance in setting-up initially.

7.4 Conclusions

Finding 1: The NIA Initiative did not have any particularly distinguishing features when compared to a broad body of landscape-scale conservation programs in the UK except for its multi-focused objectives which included equal emphasis on biodiversity conservation, ecosystem service delivery and community engagement.

The NIA Initiative was very similar in many ways to other landscape-scale programs in the UK and suffered from many of the same difficulties as other landscape-scale programs in its design and implementation. Where it did differ was in its multiple objectives, although these were not equally successfully achieved. One important element of its lack of success in achieving wider community engagement and the desired step-change in the current approach to conservation is the top-down process ultimately perpetuated by the Initiative in its emphasis on existing partnerships and lack of consideration for management context. Existing partnerships can provide fast and effective implementation but do not necessarily promote innovation.

Finding 2 The national objectives of the NIA Initiative demonstrate a variety of framings in the conservation approach; furthermore, the national approach was different to the conservation framings most evident at the local levels. The disconnect between the national and local levels likely contributed to a number
of problems experienced by the Initiative throughout the initial implementation period.

The framing of the conservation approach demonstrated by the overall NIA Initiative objectives at the national level places relatively equal emphasis on biodiversity conservation, ecosystem service delivery and community engagement. This demonstrates elements from all framings but concentrates on the ‘people and nature’ framing most. In contrast, however, there is significant variation in the framing at the local levels, with five NIAs emphasising objectives more in line with the “nature for itself” framing and seven other NIAs emphasising the “nature for people” framing. The conservation framings likely stem from the priorities of the individual NIAs which impacted where they focused their efforts. The lack of clarity in the national objectives also impacted the monitoring system, resulting in an emphasis on biodiversity objectives over ecosystem service or community engagement objectives.

Finding 3: The NIA Initiative provided flexible funding for the 12 areas but ultimately, the scale of the operations relative to the timeframe and available resources suggest that the NIA Initiative is unlikely to continue into the future in its original form.

Only one NIA has secured funding for a limited period for all aspects of the original national objectives while the other 11 NIAs have secured funding for some aspects of their original NIA work. Management context likely played a role in the ability of the NIAs to source funding following the initial three-year period. NIAs with established partnerships appear more diversified in funding sources and often have financial support from large and, in some cases EU, programs. In contrast, NIAs with less formal partnerships tend to have smaller-scale funding from fewer sources.

Finding 4: The NIA Initiative provides a variety of lessons for future landscape-scale endeavours.

- A program should consider management context throughout the design and implementation process; areas with informal or without existing partnerships are likely to need more support to set up.
- Future landscape-scale programs should endeavour to promote wider community engagement in wild nature conservation by involving all types of groups and people throughout the design and implementation process,
particularly by facilitating the development of new partnerships in areas without cohesive landscape approaches.

- It is important to have clear objectives which are measurable and implemented effectively across scales.
- Monitoring of landscape-scale programs is essential; clear, achievable indicators should be developed for all stated program objectives.
- Programs should facilitate a longer-term approach even with short-term initiatives; true landscape-scale conservation which works towards a desired step-change in the current approach to conservation is a long-term process.
- Programs should maintain flexible funding; flexible funding is important as it enables the pursuit of integrated programs and a means to address multiple aspects of social-ecological systems.
8 Conclusions

Landscape-scale programs are becoming increasingly important in addressing challenges between biodiversity conservation and the many goods and services derived from natural systems. Sustainable land management is a key focus of many of these landscape-scale programs. However, the management effectiveness of landscape-scale programs is still under-reported in the literature. Furthermore, landscape-scale programs have their own unique challenges which require additional consideration. One important feature of landscape-scale programs is community engagement; the desired step-change in the current approach to conservation is not possible without the active involvement of the wider community (Lawton et al, 2010). The NIA Initiative is a landscape-scale approach with the multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement, yet the published reports overlook many key aspects of management effectiveness analysis in their assessments.

This work has contributed to the critical and growing body of work on landscape-scale management effectiveness by conducting a thorough examination of the NIA Initiative at multiple scales. It has highlighted specifically the management contexts of the individual areas and potential synergies and trade-offs between the different objectives in order to examine the design, implementation and management of the Initiative and better appreciate the socio-ecological system dynamics contributing to the achievement or otherwise of the stated objectives. Furthermore, the investigation examines two scales, national and local, in its exploration of management effectiveness to provide an understanding of the political process of conservation by incorporating the perceptions and experiences of the local actors and managers. This thesis has demonstrated a mixed-methodological approach that acknowledges the variety of values within conservation interventions, especially with landscape-scale interventions.

Through addressing these gaps, the thesis has made several contributions to the existing evidence base and policy discourse, particularly in England. This final chapter synthesises key findings of the thesis and highlights its major conceptual, methodological and empirical contributions.

Section 8.1 outlines key contributions of this research towards better understanding of management effectiveness in landscape-scale conservation initiatives.
Section 8.2 responds to research question one, examining whether the NIA Initiative constitutes an adequate response to the recommendation for ERZs.

Section 8.3 responds to research question two, investigating the implementation of the NIA Initiative and whether it facilitates the achievement of the stated multiple objectives of biodiversity conservation, ecosystem service delivery and community engagement.

Section 8.4 responds to research question three, investigating the outputs and outcomes of the NIA Initiative at multiple scales and exploring why objectives were or were not achieved.

Section 8.5 responds to research question four, examining the successes and failures of the NIA Initiative and making recommendations for future landscape-scale endeavours.

Section 8.6 addresses key reflections from this work, focusing on contributions to the literature on management effectiveness in landscape-scale programs and avenues for future research.

8.1 The NIA Initiative and key contributions

Landscape-scale approaches form key elements for making progress both towards the Aichi targets of the UN Convention on Biological Diversity as well achieving coherent and resilient landscapes in the face of climate changes (Sayer et al, 2017; Reed et al, 2016; Harvey et al, 2014; Scherr et al, 2012). However, it is also recognised that conservation approaches must consider socio-economic development as well (Milder et al, 2012; Milder et al, 2014; Frost et al, 2006). One of the main features of landscape-scale programs is the consideration of humans as part of the system. The main goal of ERZs as put forth by Lawton et al (2010) was to facilitate a step-change in the current approach to nature conservation. The change should involve widespread community engagement in the conservation process so that people understand the value of wild nature and make decisions which prioritise it. Communities have many actors with various values, perceptions and opinions, however, and thus cannot be treated as a homogenous unit (Waylen et al, 2010). The literature suggests that existing management strategies and local communities play a key role in the implementation of conservation programs and are essential to success. Furthermore, there is the potential for conflict with regard to the objectives
of programs. Communication barriers, both within partnerships or between the partnership and the wider community, can exacerbate the issue by too limited a period of time to develop and legitimise conservation objectives which truly resonate with local people in their areas (Eigenbrod et al, 2016).

In this thesis, conservation interventions like the NIA Initiative are acknowledged as a synthesis of intricate interactions between climate, ecosystems and political as well social systems within inherently complex and dynamic situations. This work has provided novel insights into the management effectiveness of the Nature Improvement Area Initiative, a landscape-scale program with multiple objectives, and the various factors impacting the achievement of its objectives. It provides empirical data on environmental, political and social values at multiple scales and examines crucial aspects of the Initiative which had been overlooked in the Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014; CEP, 2015). The mixed-methodological approach adopted provides deeper explorations of the meanings and processes of biodiversity conservation, ecosystem service delivery and community engagement in the local areas and how these relate to the national objectives.

Ultimately, this research:

1. Illustrates the value of local context in the effective implementation and management of a conservation initiative;
2. Discusses the importance of the consideration of synergies and trade-offs between objectives in all aspects of design, implementation and management of a landscape-scale conservation initiative;
3. Emphasises the importance of scale by providing an examination of local and national perspectives in landscape management effectiveness;
4. Provides recommendations for improvements to similar, future landscape-scale programs; and
5. Enhances understanding of landscape management effectiveness through incorporation of characteristics specific to the unique nature of landscape-scale initiatives.

8.2 Linking management contexts, biophysical features and national agendas

**Research gap:** The NIA Initiative was created in response to recommendations for ERZs put forth in the Lawton Report (Lawton et al, 2010), yet no work has ever considered the effectiveness of the design of the Initiative as a response to those recommendations for ERZs. To overcome this gap and develop a clear understanding
of the objectives of the ERZs and the NIAs, as well as establish a clear set of objectives for the subsequent NIA management effectiveness assessment, it is essential to consider whether the NIA Initiative constitutes an appropriate response to the original vision of Lawton et al (2010).

**Key challenges:** As identified in Chapters 2 and 3, significant steps have been taken towards addressing problems with the current approach to conservation which is focused on smaller protected areas. One important shift is that of landscape-scale conservation, where the emphasis is on socio-ecological systems and the important role that people play in those systems. However, less information is available on the effectiveness of the design and implementation of landscape-scale interventions. The first question aimed to examine key components of the socio-ecological systems which impact the design and implementation of the programs and compare between ERZs and NIAs. The focus of Chapter 4 was on assessing whether the NIA Initiative truly addressed the recommendations of the ERZs.

**Conceptual and methodological contributions:** The goal of this chapter was to make the management effectiveness framework applicable practically, through context-specific assessments of relevance to the local NIAs. One of the key elements of the management effectiveness framework is context which was entirely overlooked by the annual Monitoring and Evaluation Reports (CEP, 2013; CEP, 2014; CEP, 2015) regarding the NIA Initiative. Context, and its impact on management effectiveness, is key at both national and local levels. The NIA Initiative was developed from the recommendations for ERZs in the Lawton Report (Lawton et al, 2010) and this thesis argues that it is essential to understand context, that is the key components of the ERZs, in order to explore the management effectiveness of the NIA Initiative. Furthermore, it is also important to understand how the national design and implementation of the Initiative was experienced at a local level in the individual NIAs and how the individual contexts of the NIAs impact the implementation at a local level.

**Empirical contributions:** The results suggest that, ultimately, the NIA Initiative does not constitute an adequate interpretation of the Lawton Report’s (Lawton et al, 2010) recommendations for the ERZs given the divergence in policy drivers, varied emphases for recommended actions and deviation in desired outcomes as well as the inadequate consideration of the required time and financial resources necessary to implement the program. The ERZ recommendations emphasise space for nature, a coherent and resilient ecological network focused on restoring the ecological
systems and processes which underpin ecosystem services. The NIA Initiative emphasises sustainable use of nature, promoting a dual mandate of benefits for people and nature. This disparity is further emphasised by the short-term nature of the Initiative and limited funding, which ultimately prevented the NIA Initiative from being an effective interpretation and implementation of the ERZ program as put forth by the Lawton Report (Lawton et al, 2010) but also impacted the likelihood of achieving the desired step-change in nature conservation.

Furthermore, the Lawton Report’s (Lawton et al, 2010) consideration of ecosystem service delivery and win-win scenarios is limited in scope, brief and inconsistent. Of the four ecosystem services addressed in the Lawton Report, only one is framed so as to prioritise space for nature, specifically inland water management. Recreation, carbon and coastal management are all framed so as to prioritise the service equally or over space for nature and none of the services discussed consider any potential trade-offs between wild nature conservation and ecosystem service delivery. This trend is also seen throughout the NIA Initiative.

Moreover, the NIA Initiative emphasised a top-down approach which focused on existing partnerships and connections with landscape designations. This is in contrast to the wide partnership of local people envisioned by Lawton et al (2010) which was intended to be a bottom-up effort supported by individual citizens as well as groups from across the local communities. Analysis of data triangulated from a variety of sources reveals that the NIA Initiative emphasis on existing partnerships and connections with landscape initiatives benefits certain types of areas with largely formal partnerships in place when making NIA bids. By reinforcing existing partnerships who favoured connections with known partners, the NIA Initiative ultimately limited its potential to achieve the desired step-change by restricting larger community involvement. This informed the identification of three Management Group typologies of NIAs based on their management contexts. These contexts guided the partnerships’ selection of the wider management spaces of the NIAs, the focal areas within the wider landscapes and, ultimately, the biophysical features focused on by the various NIAs. Management Group 1 includes NIAs with a landscape-management body as a partner and those areas tend to have larger percentages of their areas covered by both priority habitat and small protected area designations when compared to either Management Group 2, NIAs with formal / informal partnerships, or Management Group 3, NIAs with informal or newly formed partnerships.
In emphasising existing partnerships, the NIA Initiative also potentially limited innovation by promoting stakeholder groups with strong lead bodies largely inclined to continue with their own agendas and management strategies. In terms of management context, having an existing partnership, particularly one which included a landscape designation management body, provided a strong base from which to launch an NIA bid as 1) NIA partnerships were largely a feature of the existing management structures as indicated by 8 NIAs, 2) the lead bodies coordinated the participation of other groups, generally preferring those with whom a working relationship was already established, and 3) lead bodies or steering groups of core organisations decided on the strategic vision of the NIAs which is derived from the priorities of those organisations. The NIA Initiative process, by emphasising areas which are already generally involved in the conservation dialogue, provides additional barriers to areas where landscape management is informal and more fragmented, areas where a step-change might potentially be achieved. Essentially, the Initiative ultimately somewhat limited the scope for innovation by facilitating bids from areas and partnerships with established working practices and objectives.

8.3 Biodiversity conservation and ecosystem service delivery: achieving sustainable land use

Research gap: A practical understanding of the underlying factors that contribute to the achievement of program objectives throughout the implementation, at a local level, of individual NIAs and, more broadly, in the larger Initiative is necessary to design and target effective landscape-scale interventions which address sustainable land management.

Key challenges: A key aspect of sustainable landscape management is the consideration of multiple, potentially conflicting objectives. In the NIA Initiative, the key objectives are biodiversity conservation, ecosystem service delivery and community engagement in the process. This chapter addresses the consideration of these multiple objectives throughout implementation of the Initiative at both national and local scales including potential synergies and trade-offs within and between objectives.

Conceptual and methodological contributions: This thesis has conducted empirical analysis that goes beyond traditional conceptualisations of management effectiveness by providing a detailed disaggregation of factors surrounding and
contributing to management effectiveness in the implementation of the NIA Initiative and progress towards its objectives. The central aim of the analysis conducted in Chapter 5 was not merely to measure or quantify biodiversity conservation and ecosystem service delivery. Instead, a more flexible and exploratory approach was applied using mixed methods where the goal is to use both primary document data, local NIA knowledge and geo-spatial data as well as secondary data to examine the management effectiveness of the implementation of the NIA Initiative at two scales, namely both national and local levels.

**Empirical contributions:** The implementation of the NIA Initiative did not facilitate the achievement of all objectives but instead emphasised biodiversity conservation over ecosystem service delivery and community engagement. This was evident throughout the implementation and was impacted by a number of factors including the timeline, the local objectives and the design of the monitoring system.

The NIA Initiative was designed and implemented over approximately four years, from the middle of 2011 through to the middle of 2015, a short period. Furthermore, the short-time scale meant that NIAs developed plans largely based on existing work, which was ultimately, despite the best intentions, far more focused on biodiversity conservation goals as opposed to ecosystem service delivery goals.

Upon examining the objectives and targets of the individual NIAs and examining their emphases, whether biodiversity conservation-focused or ecosystem service delivery-focused, it is clear that there are far more objectives that seek to improve biodiversity conservation, 41, than those which seek to improve the delivery of certain ecosystem services, 29, although the break-down varies according to the individual NIA. Though some of the NIAs did frame their approaches with emphasis on benefits for people, the clarity of the biodiversity objectives was far better than that of the ecosystem service objectives or community engagement objectives. For example, only four NIAs actually identified priority ecosystem services in their objectives and one NIA did not mention the phrase ‘ecosystem service’ in their business plan at all.

The monitoring system, rushed and heavily dependent on existing, predominantly national data sets, also emphasised biodiversity conservation over ecosystem service delivery. Those ecosystem services that are measured are poorly framed and based on indicators that largely examine the potential contribution of habitats to the delivery of those services rather than actually measuring the services themselves. Thus, it is impossible to identify any change in provision of an ecosystem service or social engagement though any measurable change is unlikely regardless given that the
program ran for only three years. The biodiversity indicators are more appropriate but still measure only basic aspects of biodiversity, namely the change in extent of habitats of conservation concern and counts of certain focal, largely charismatic species. The monitoring system was hampered by limited data availability and the problem of monitoring diverse areas at multiple scales. When the number of indicators reported is assessed, NIAs focused far more on biodiversity indicators, reporting 56% of all possible biodiversity indicators and only 41% of the possible ecosystem service indicators in Year 3, a trend which is seen in all three years.

Furthermore, there was little consideration of potential trade-offs between objectives, particularly with regard to land use, which varied with regard to Management Group. The development of NIAs in urban / suburban areas was promoted within the objectives of the NIAs (NIA 1). The NIA Criteria (NIA 2) and Guidance Notes (NIA 1) also address sustainable use areas including agricultural land. Thus, many of the NIAs, specifically those in Management Groups 2 or 3, have large areas of both agricultural and / or built-up areas. However, the NIAs were also meant to provide buffer zones for high quality core areas and improve connectivity between these core sites. Assessment reveals that NIAs offer, in general, poor to moderate buffering potential of core sites at a landscape-scale. In other words, priority habitat within core areas is generally surrounded by agricultural or urban land uses within the rest of the NIAs. While this does not necessarily mean that there is no potential for the NIAs to provide suitable buffers for the core areas it does indicate a reasonable and potentially conflicting variation in land use. Ultimately, NIAs which have large areas of agricultural or built-up land use, as those in Management Groups 2 or 3 do, are less likely to be able to provide suitable buffer zones, although this depends upon certain factors such as the type of agriculture and the land management strategies.

The NIAs do have the potential to be able to contribute moderately to the connectivity of England’s ecological network however, although this varies between individual NIAs. What the NIAs do specifically provide is landscape-scale approach and coverage in some areas not traditionally included in the existing ecological network of landscape designations, particularly more built-up areas as emphasised in the overall NIA objectives. This presents a trade-off, however; areas which extend into built-up spaces, as some NIAs in Management Groups 2 and 3 do, can help provide increased coherence and resilience in the existing ecological network by facilitating the restoration of smaller, core areas as well as foster improved delivery of some ecosystem services, like access and recreation. However, the natural qualities of some sites might be compromised by the areas of built-up land use nearby.
Essentially, a landscape-scale initiative with limited resources cannot have it both ways; it should either concentrate on conserving what is there using established institutions or focus on less endowed areas.

The lack of consideration for potential trade-offs between objectives is also illustrated by the results of the concurrence assessment between biodiversity conservation and ecosystem service delivery within the NIAs. Some NIAs, particularly those in Management Group 1, have the potential for several win-win scenarios for both biodiversity conservation and the delivery of several ecosystem services, but some NIAs, predominantly NIAs with large areas of agricultural or urban land use in Management Groups 2 and 3, have fewer potential win-win scenarios and more potential trade-offs. Essentially, the Management Group context carries through to the areas chosen by the NIAs to focus on and the biophysical features included. NIAs which include a landscape management body as a partner, that is NIAs in Management Group 1, tend to have a greater percentage of their area which is priority habitat, which results in more synergistic opportunities with regard to many of the ecosystem services. However, NIAs in Management Groups 2 or 3 could contribute to the ecological network in key ways by focusing on areas not traditionally covered by the existing ecological network. Furthermore, even though an NIA might not necessarily be likely to have many win-win opportunities for both biodiversity and service delivery at a landscape scale, there may be potential at different scales. However, local-scale win-wins might still not necessarily provide the potential for the opportunities to be “exploited to the full” as sought by the NIA objectives (NIA 1, p 5).

8.4 Outputs and outcomes: challenges in landscape-scale implementation

**Research gap:** The goal of this chapter was to assess not only what the outputs and outcomes of the NIA Initiative were but why or why not those were achieved.

**Key challenges:** As has been established by Chapters 4 and 5, the NIA Initiative ran for only three years and was largely focused, albeit unintentionally, on the biodiversity conservation objectives over the ecosystem service delivery or community engagement objectives. Landscape-scale interventions generally run for longer and require data to establish baselines in order to assess the effectiveness of the intervention. As a result of the inadequate quantitative data, the assessment of the outputs and outcomes is largely narrative-driven. Despite the lack of quantitative data,
qualitative data can provide key information on the local experiences of the NIAs and their perceptions of the achievement of national objectives.

**Conceptual and methodological contributions:** By examining local perceptions, this work seeks to explore how the design and implementation of the Initiative came together with the local experiences of the individual NIAs and resulted in the realised outputs and outcomes. It also examines those objectives which were not achieved and why. Furthermore, it seeks to employ this knowledge to complete the last stage of the cycle of management effectiveness; identifying specific challenges in the implementation of the NIA Initiative as a landscape-scale program with which to address how those might be improved upon in future programs, the subject of Chapter 7 and discussed in Section 8.5.

**Empirical contributions:** The results suggest that the NIA Initiative did not achieve many of its key outcomes. Biodiversity outputs were more evident than ecosystem service outputs at both national and local levels. This is impacted by the fact that the NIA Monitoring System focused on biodiversity indicators over ecosystem service indicators. Respondents to the government’s survey of NIA outcomes clearly indicate mixed thoughts on how much the NIAs contributed to the promotion of the ecosystem service concept or to the improvement of the delivery of most ecosystem services considered by the Initiative.

At a local level, many of the NIAs had both biodiversity and ecosystem service objectives but when discussing their priorities, indicated that they were focused on the biodiversity delivery outputs and outcomes. Any improvements to ecosystem service delivery were secondary benefits of their primary target; the conservation of wild nature. Although the problems associated with the ecosystem service indicators likely contributed to this imbalance, the prioritisation of biodiversity outcomes over ecosystem service outcomes ultimately stems from the priorities of the stakeholder groups directing the activities and delivery in the individual NIAs.

There was limited involvement of the wider community in the NIA Initiative; this occurred across scales including at a local level within partnerships, and between NIAs and with other programs at a national level. Those NIAs reporting some type of community engagement were largely focused on certain types of activities encouraged by the NIA Monitoring System, namely education and volunteering; areas in Management Group 3 were more likely to report having taken innovative approaches to engagement, perhaps because they were less influenced by existing partnership structures. Thus, little progress was made in achieving wider community
involvement. Wider community involvement was partially hampered by constrained collaboration of the NIAs with local communities and stakeholders within partnerships as a result of the design of the Initiative, minimal collaboration between NIAs due to the rushed implementation of the Initiative and almost no collaboration beyond the Initiative due to limited national leadership.

Limited national leadership was a major challenge for the NIA Initiative at a local level. Nine NIAs identified national leadership as inadequate and this resulted in what the NIAs felt were ‘missed opportunities’ to make the NIA Initiative more effective in working towards the desired step-change in nature conservation. Several NIAs identified a lack of support from the organisations at a national level in promoting the NIA Initiative and its goals so that ultimately, while it was well-known among stakeholders and relevant conservation organisations, it did not really penetrate into the consciousness of the larger population. It was also felt that the lack of national leadership, particularly at the end, called into question the continued effectiveness of the NIAs beyond the initial three-year period.

Ultimately, the NIAs were unable to achieve significant progress towards the desired step-change in the current approach to conservation. The limited community engagement and the lack of collaboration at all levels of the NIA Initiative prevented the Initiative from truly achieving much progress towards a step-change in nature conservation. It did not engage the wider community and encourage an understanding of the natural environment leading to behavioural change. While the NIA Initiative absolutely did important work, it predominantly enabled existing partnerships to, in large part, continue on with their existing structures and management strategies as opposed to really engaging groups not necessarily as involved in the conservation dialogue and facilitating innovation in wildlife conservation.

8.5 Learning from the NIA initiative: lessons for future landscape proposals

**Research gap:** The goal of this chapter was to make the management effectiveness framework pertinent practically to the landscape-scale NIA Initiative through context-specific assessments and subsequent recommendations of relevance to the unique features of landscape programs.
**Key challenges:** One of the key features of the IUCN management effectiveness framework is that it forms a cycle; adaptive management requires the identification and implementation of specific recommended actions that are derived from effective evaluations of both individual areas and their wider networks. This is also a key element of landscape approaches, which acknowledge the significance of a comprehensive understanding of impacts and outcomes in a dynamic environment through means of learning, flexibility and adaptability (Sayer, 2009). The data and analyses from the first three analysis chapters can help provide insight and form recommendations for improvements to future landscape-scale programs like the NIA Initiative.

**Conceptual and methodological contributions:** The analysis conducted in Chapter 7 provided recommendations for future landscape-scale programs by examining the strengths and weaknesses of the NIAs demonstrated in previous analysis chapters. The NIA Initiative had multiple, potentially conflicting objectives that were unevenly addressed throughout the design and implementation of the program. The challenges of managing for multiple, potentially conflicting objectives is likely to increase with changes, be those global climatic changes or local changes. Successful strategies to tackle sustainable land management therefore need to consider all aspects of the management effectiveness framework to examine interventions and address any weaknesses. Understanding the successes and failures of a program facilitates adaptation and improvement, progressing toward the ultimate goal of sustainable land management. A true step-change in the current approach to conservation requires long-term programs and even shorter interventions should facilitate the achievement of long-term goals.

**Empirical contributions:** Chapter 7 illustrates that the NIA Initiative did not have any particularly distinguishing features when compared to a broad body of landscape-scale conservation programs in the UK except for its multi-focused objectives which included equal emphasis on biodiversity conservation, ecosystem service delivery and community engagement at a national level, although not at a local level. The NIA Initiative also suffered from many of the same difficulties as other landscape-scale programs in its design and implementation. One important element of its lack of success in achieving wider community engagement and the desired step-change in the current approach to conservation is the top-down process ultimately perpetuated by the Initiative in its emphasis on existing partnerships and lack of consideration for management context.
Furthermore, the disconnect between the national and local levels likely contributed to a number of problems experienced by the Initiative throughout the initial implementation period. The framing of the conservation approach demonstrated by the overall NIA Initiative’s objectives at the national level places relatively equal emphasis on biodiversity conservation, ecosystem service delivery and community engagement. This demonstrates elements from all framings but concentrates on the ‘people and nature’ framing most. In contrast, however, there is significant variation in the framing at the local levels, with five NIAs emphasising objectives more in line with the “nature for itself” framing and seven other NIAs emphasising the “nature for people” framing. The conservation framings likely stem from the priorities of the individual NIAs which impacted where they focused their efforts. The lack of clarity in the national objectives also impacted the monitoring system, resulting in an emphasis on biodiversity objectives over ecosystem service or community engagement objectives.

The NIA Initiative did have some positive features, namely the flexibility of funding in the program. However, the scale of the operations relative to the timeframe and available resources limited its outputs and outcomes. Furthermore, the results also indicate that the NIA Initiative is unlikely to continue into the future in its original form. Only one NIA has secured funding for a limited period for all aspects of the original national objectives while the other 11 NIAs have secured funding for some aspects of their original NIA work. Management context likely played a role in the ability of the NIAs to source funding following the initial three-year period. NIAs with established partnerships as in Management Group 1 appear more diversified in funding sources and often have financial support from large and, in some cases EU, programs. In contrast, NIAs with less formal partnerships, particularly in Management Group 3, tend to have smaller-scale funding from fewer sources.

Ultimately, the NIA Initiative provides a variety of lessons for future landscape-scale endeavours, addressed at the end of Chapter 7.

8.6 Reflections on the research

Conservation must confront the major challenge of providing people with the goods and services they currently require from wild nature while maintaining the capacity of natural systems to provide those resources for future generations as well. This is a challenge that must be confronted across scales, the most recently emphasised
approach of which is landscape-scale. Landscape-scale initiatives seek to achieve multiple outcomes through targeted interventions, but the effectiveness of these approaches is not always successfully demonstrated (Sayer and Campbell, 2004) as illustrated by this thesis. However, there is still a clear requirement to compile data to demonstrate the value of landscape-scale approaches (Sayer et al, 2017) and to learn from current programs to improve effectiveness in the future. Though much remains to be done, several potential directions for future research have become evident throughout the writing of this work and are explored below.

There is a need for the academic community to assess the effectiveness of landscape-scale projects in the short-term to improve impact in the long-term. Effective assessment is inhibited by the fact landscapes are large-scale, complex environments with features that are challenging to quantify, impacted by various pressures or drivers and evolve gradually through time (Pfund 2010). Though landscape initiatives are frequently analysed with consideration for some, individual attributes against specific targets, outputs or outcomes, Sayer et al (2017) suggest that monitoring systems rarely result in information about the wider success of the landscape area in delivering longer-term enhancements of the natural environment or local communities (Reed et al, 2015; Reed et al, 2016). The lack of any formal approach for examining the impact of landscape initiatives has been noted by other researchers as well (Sandker et al. 2009; Milder et al. 2014; Sayer et al. 2016). While landscape-scale interventions should be long-term in approach, it is necessary to have indicators which can function over shorter periods in order to demonstrate progress throughout the design and early implementation of initiatives, particularly in order to inform and feedback into adaptive management strategies (Sayer et al, 2017). Such strategies are essential to address the current institutional and society challenges limiting landscape-scale approaches, for example the short-term funding discussed in Chapter 7.

As the importance of humans in natural systems is increasingly evident, it will become necessary to develop and quantify new indicators in novel ways in order to fully examine complex socio-ecological systems (Sayer et al, 2017; Mace et al, 2012). One important element is the consideration for the many roles that biodiversity has to play in ecosystem services, particularly given the multiple, potentially conflicting objectives of landscape initiatives. It is important to explore the underpinning processes of ecosystems and understand where there are synergies and trade-offs and how these might vary with environmental change (Mace et al, 2012). However, consideration must also be given to socio-ecological science and, due to the dynamism of
landscapes and stakeholders, metrics must address the entire continuum of effects (Sayer et al, 2017).

Evidence from this study has shown that local knowledge, understanding, education and engagement are central to effective landscape-scale programs and that local management and biophysical context are important features to consider in the design and implementation of new landscape-scale programs. For example, features such as citizen science can have important roles in driving this community engagement (Sayer et al, 2015) but programs should endeavour to engage with many different elements of the local communities in a variety of ways. The NIAs, for example, relied heavily on existing volunteers, but failed to engage significantly with other aspects of their local communities as discussed in Chapter 6. Many areas demonstrated a preference for existing partnerships and known stakeholders, though not all did. More investigation could be conducted into different stakeholders as the landscape approach should facilitate the equitable engagement of all stakeholders (Sayer et al, 2017).

There are also some important limitations with this work which should be acknowledged. Some literatures are not addressed, for example political ecology, governance studies on nature conservation, evaluation frameworks and the use of indicators in environmental domains. Furthermore, this study has relied heavily on the observations of the NIA managers and those involved with the on-the-ground running of the areas, those people designing and conducting the implementation strategy at a local level, which is a small population and, in some cases, includes only one person from an NIA. This work did not engage with others involved more tangentially with the implementation of the NIA Initiative at a local level, which might have provided a larger population from which to seek data. This work did not explore financial data such as the budgets at a local level or the allocation of resources to different areas. This work did not explore specific NIAs and their management practices in greater depth through use of a case study of a subset of NIAs; the researcher acknowledges the value of a such an approach as well as the limitations of this work but elected for the method ultimately employed in order to understand broader trends within the NIAs at a local level.

Part of the reason for these choices stems from the evaluation approach selected. The Magenta Book, the UK Government’s manual on good evaluation practice, identifies three broad categories of evaluation: process, impact and value-for-money. There are inherent flaws with each approach. For example, the published NIA
evaluations (CEP 2013, 2014a and 2015a) are largely impact evaluations designed to assess the difference the NIA Initiative made, which has a number of weaknesses discussed throughout this work. This research, however, focuses on process evaluation, exploring the design, implementation and management of the Initiative and the how / why of the outputs and outcomes. Process evaluation is particularly important where expected outcomes were not achieved in order to understand whether the challenges are the result of the intervention design, the implementation or delivery and whether / how these identified issues can be overcome in either the existing or future interventions. What this does not explore is value-for-money or the financial aspects in great depth.

Evaluations frequently have overarching limitations which should also be considered. Evaluations are often constrained by factors such as short timeframes both to conduct an evaluation but also over which to monitor and detect impact (Hildén 2009), limited funding, confused objectives which are difficult to measure and / or incomplete / insufficient data as a result of challenges during the monitoring and evaluation processes (Kapos et al, 2008; Margoluis et al, 2009). Furthermore, managers are not always willing to discuss the challenges or failures of their programmes (Redford and Taber 2000). Frequently, it is difficult to truly assess progress as the time necessary to demonstrate positive change to social and ecological systems extends beyond the programme implementation period of many projects (Margoluis et al, 2009). However, this work is in favour of the opinion that such challenges should not stop evaluation but inform processes so that evaluations are designed and applied to suit the situation and context of the programme of interest (Stem et al, 2005; Kapos et al, 2008; Mickwitz and Birnbaum, 2009).

In summary, this thesis has provided an in-depth exploration of the management effectiveness of the landscape-scale NIA Initiative with specific emphasis on exploring the local perceptions and experiences and how this interacts with the national objectives of the program. In doing so, this research has made empirical and conceptual contributions to emergent literature on landscape-scale program management effectiveness, evidence around evaluation of government nature conservation programmes and broader studies on the interactions between land uses and management for multiple objectives. It does not, however, contribute to academic literature on ecological governance / nature conservation policy studies and / or evaluation studies.
The momentum behind landscape-scale program management effectiveness still requires a significant push; the current international political climate and particularly the overhaul of many policies in England as a result of the exit of the UK from the European Union, could provide an opportunity to capitalise on this momentum. In facilitating solutions for the achievement of multiple objectives in landscape-scale interventions, context-specific, long-term commitments are required. In this thesis, the management effectiveness of the NIA Initiative is examined but this is merely one aspect of adaptive management; it is essential to address the failures of the NIA Initiative in order to improve the effectiveness of subsequent programs, to implement the lessons learned. Importantly, programs should endeavour to facilitate better understanding of the contexts of local areas in the design and implementation of these programs.
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Title of Project:
EXPLORING NATURE
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MOTIVATIONS AND
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MANAGEMENT APPROACH TO
BIODIVERSITY
CONSERVATION AND
ECOSYSTEM SERVICE
DELIVERY

Ethics Approval Number:
N/A

Investigator(s):
Marie L Longnecker

Researcher Email:

Please read the following statements and, if you agree, initial the corresponding box to confirm agreement:

I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.

I understand that my data will be treated confidentially and any publication resulting from this work will report only data that does not identify me.

I freely agree to participate in this study.

Signatures:
If you would like a copy of this consent form to keep, please ask the researcher. If you have any complaints or concerns about this research, you can direct these, in writing, to the Research Ethics Co-ordinator by email at: ethics@ucl.ac.uk. Alternatively, you can contact us by post at: Research Ethics Co-ordinator, Academic Services, UCL, Gower Street, London WC1E 6BT.
Appendix II
Sample study information sheet.

Institute for Sustainable Resources
Central House
University College London
London, WC1H 0NN

<table>
<thead>
<tr>
<th>Study Information Sheet</th>
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<tbody>
<tr>
<td>Title of Project:</td>
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<tr>
<td>EXPLORING NATURE</td>
</tr>
<tr>
<td>IMPROVEMENT AREA</td>
</tr>
<tr>
<td>MOTIVATIONS AND</td>
</tr>
<tr>
<td>PRIORITIES TO UNDERSTAND</td>
</tr>
<tr>
<td>MANAGEMENT APPROACH</td>
</tr>
<tr>
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<td>CONSERVATION AND</td>
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<td>DELIVERY</td>
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</tr>
<tr>
<td>N/A</td>
</tr>
<tr>
<td>Investigator(s):</td>
</tr>
<tr>
<td>Marie L Longnecker</td>
</tr>
<tr>
<td>Researcher Email:</td>
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</tbody>
</table>

Aims of the Study:
This research sets out to understand the motivations, priorities and management of each, individual NIA. This will be used to understand how the NIA initiative fits within the larger England and UK biodiversity conservation framework.

Eligibility Requirements:
None beyond that participant is involved with relevant NIA.

What participant will need to do and any expected time commitment:
The participant would be asked to undertake an interview to address questions regarding application, priorities and management of the NIA lasting as long as the participant is comfortable with the process but ideally long enough to cover all questions which should take approximately an hour.

Risks/Discomforts involved in participating:
The interview will be recorded but no risks or other discomforts are expected.

Confidentiality of your data:
Only the researcher will have access to the data which will be completely anonymous and provided upon request of the participant.

Remember that participation in this research study is completely voluntary. Even after you agree to participate and begin the study, you are still free to withdraw at any time and for any reason.
If you would like a copy of this consent form to keep, please ask the researcher. If you have any complaints or concerns about this research, you can direct these, in writing, to the Research Ethics Co-ordinator by email at: ethics@ucl.ac.uk. Alternatively, you can contact us by post at: Research Ethics Co-ordinator, Academic Services, UCL, Gower Street, London WC1E 6BT.
Appendix III
Sample semi-structured interview guide.

Interview Guide

Date_____________ Area___________________ Form No.________________
Obtain oral consents____________
Obtain written consent__________

Motivations and drivers

1) Introductory Question: Can you tell me a bit about how the area was managed prior to the establishment of the NIA?

Follow-up questions:
Were there other designations in place? If so, what?
How formal was the organisation of the area prior to the NIA initiative?

2) Introductory Question: Can you tell me about the initial interest in taking part in the NIA initiative in 2012?

Follow-up questions:
Were there any particular reasons for wanting to participate in the initiative?
Was there a driving force behind the application? If so, who or what?

3) Introductory Question: Could you tell me about the reasons for establishing the area as it is?

Follow-up questions:
Why was this area chosen?
Why was this landscape chosen?
Are there any features that the applicants felt should be included? If so, why?
Are there features that were not included? If so, why?

4) Introductory Question: Could you elaborate on how priorities were decided upon for the bid?

Follow-up questions:
Who was involved with decisions concerning priorities?
How were such individuals/groups involved?

Akers and stakeholders

5) Introductory Question: Could you tell me about the organizations that formed the original stakeholder group?
Follow-up questions:
How did they become involved?
Have other stakeholders become involved since?

6) Introductory Question: In what manner do stakeholders participate with the NIA?
Follow-up questions:
How are stakeholders involved?
Are all stakeholders equally involved?
Do all stakeholders participate in management strategy decisions? If so, how?

7) Introductory Question: Has the community been involved?
Follow-up questions:
If so, how?
Has community participation, volunteers, etc changed with the NIA initiative?

Priorities and management

8) Introductory Question: Can you tell me about the management strategy?
Follow-up questions:
How was the management strategy developed?
Are there features of the strategy that you feel are working particularly well?
Features that aren’t working as well?

9) Introductory Question: Did you incorporate any existing management strategies?
Follow-up questions:
What were they?
How?

10) How were the NIA priorities developed in the management strategy?
Follow-up questions:
What are those priorities?
What conservation initiatives, if any, are prioritised? Why?
(If ES are mentioned by respondent ask, if not wait until end): What ecosystem services, if any, are prioritized? Why?

11) Introductory Question: Could you tell me about the restoration projects?
Follow-up questions:
How were the areas designated for restoration identified?
Could you elaborate more on the restoration process?

12) Introductory Question: Could you tell me about any ecosystem service projects?
Follow-up questions:
Why are those projects included?
Do the services provide win-win scenarios with biodiversity conservation?

13) Introductory Question: What are your thoughts on the progress made so far?
Follow-up Questions:
Is there a particular project that has worked really well? If so, why?

14) Introductory Question: Could you elaborate on how the establishment of the NIA impacts or has impacted the community?
Follow-up questions:
Are there groups that benefit?
Are there groups that haven't benefitted as much?

15) Introductory Question: What are your overall thoughts on or experience with the NIA initiative?
Follow-up questions:

Are there any particularly benefits to the NIA initiative? Anything that hasn’t worked as well?
Are there particular strengths to the NIA initiative?
Are there weaknesses to the NIA initiative?

16) Do you collaborate with other NIAs?
Follow-up questions:
If so, how?
Do all NIAs participate?

17) Have / do you collaborate with organisations outside the NIA Initiative?
Follow-up questions:
If so, how?

18) Is there anything we haven’t covered that you would like to add?
Follow-up questions:
Do you have any recommendations for documents that might help me explore anything we’ve discussed further?
Are there other people you would recommend talking to?
If I have any additional questions, would you mind if I contacted you at a later date?
# List of interviews

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<th>Organisation</th>
<th>Date</th>
<th># of participants</th>
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<td>Dearne Valley NIA</td>
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<td>16</td>
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Appendix V

Results of the Chi Square Buffer analyses. The null hypothesis is that the proportions of the three different land uses are similar in the two areas being compared. The rows highlighted in orange show situations in which the null hypothesis has been accepted.

a) Core areas and NIA

<table>
<thead>
<tr>
<th>NIA</th>
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<th>X² Value</th>
<th>Significance level</th>
<th>Accept null hypothesis</th>
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b) NIA and 1-kilometre buffer

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Appendix VI

Concurrence assessment figures not included in main text.

a) Carbon and priority species richness

![Graph showing carbon storage and priority species richness](image)

b) Recreation and priority habitat

![Graph showing recreation and priority habitat](image)
c) Recorded Flood Outlines and priority habitat

![Graph showing Recorded Flood Outlines and priority habitat]

- AONB
- NIA
- NP
- England Avg

d) Recorded Flood Outlines and priority species richness

![Graph showing Recorded Flood Outlines and priority species richness]

- AONB
- NIA
- NP
- England Avg

Priority habitat (avg area / km²)

Priority species richness (avg distinct count / km²)
e) Flood Risk Areas and priority habitat

![Graph showing flood risk areas and priority habitat](image)

f) Flood Risk Areas and priority species richness

![Graph showing flood risk areas and priority species richness](image)
g) Flood Zones 2 & 3 and priority habitat

h) Flood Zones 2 & 3 and priority species richness

i) Urban area and priority habitat
j) Urban area and priority species richness

![Graph showing urban area and priority species richness.]

k) Correlations among per-unit-area (1 km²) biodiversity and ecosystem service values (n = 54; Pearson correlation coefficients).

<table>
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<th></th>
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<th>Priority Species richness</th>
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<th>Carbon Storage</th>
<th>Recreation</th>
<th>Urban/Suburban Land</th>
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<th>Flood Zones 2 &amp; 3</th>
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