Improvement Programme for England's Natura 2000 Sites (IPENS)

Implementation progress report 2015-2018

www.gov.uk/government/publications/improvement-programme-for-englands-natura-2000-sites-ipens

Contents

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Environment Agency
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Marine Management Organisation
Local Nature Partnerships
Somerset Wildlife Trust
Woodland Trust
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Executive Summary

Background

Natural England in partnership with the Environment Agency launched The Improvement Programme for England's Natura 2000 Sites (IPENS) in April 2013 with €1.8m of EU LIFE+ funding support. The Programme developed a shared understanding of issues affecting the condition of Natura 2000 sites, what was needed to tackle them and who should do it through the production of Site Improvement Plans, strategic Theme Plans and by funding a range of evidence projects. Collectively over 3000 actions to tackle issues across the Natura 2000 network were proposed. At the close of the IPENS LIFE+ project in 2015 an 'AfterLIFE' Implementation Plan set out how conservation activities would continue and develop.

Our approach

The Implementation Plan was put into practice by Natural England through two linked projects: the IPENS Prioritisation Project (summarised in Chapter 2, but not the main focus of this report) and the IPENS Implementation Project. The Implementation Project was managed nationally and advised by an Implementation Steering Group with representatives from Natural England and partner organisations. Responsibility for the implementation of Site Improvement Plans, IPENS funded evidence projects and Theme Plans was given to Natural England Area Teams and specialist staff, working with partners as appropriate. The Project Manager oversaw direct implementation, indirect implementation through the contributions of wider work and communication.

Project objectives

The objective of the IPENS Implementation Project was to make sure that work was underway to translate the recommendations made by IPENS into action and to embed ongoing delivery into Natural England 'business as usual' for future years, across relevant work areas:

- Site level improvements;
- Addressing issues at a strategic level;
- Evidence and funding
- Skills and capability gaps
- Communication and partners

This Implementation Progress Report (Chapters 3-8) gives an overview and examples of the work directly resulting from the Implementation Project and wider work which has contributed to it, since the close of the LIFE+ funded IPENS project (2015 – 2018).

Assessing progress

Recognising that full implementation of IPENS recommendations will take many years, a suite of interim success criteria was agreed with the Implementation Steering Group against which to monitor project progress over the period of the Implementation Project. This report demonstrates that good progress against the interim success criteria has been made, with most criteria assessed as underway or complete.

Successes and challenges

Examples of good practice and success stories are used throughout the report to illustrate the differences that are being made as a result of the IPENS project. Notable successes have been achieved when IPENS findings have helped to lever in additional funding, where Theme Plans have driven the delivery of new mechanisms to address impacts and where Site Improvement Plans have been used to facilitate improved partnership working. Challenges experienced include difficulties with resourcing the work required, and demonstrating that on-the-ground improvements have been as a direct result of IPENS implementation.

Future implementation

Looking to the future, an IPENS Exit Strategy has been produced which will help to embed IPENS findings into Natural England's protected sites delivery 'business as usual' with partners. Achieving what we need for Natura 2000 will be a pivotal part of how we deliver the Government 25 Year Plan and Natural England will use the aspirations of its Conservation 21 Strategy to guide how we do this. IPENS products will therefore have wider value, not just for protected sites, but for achieving lasting nature recovery which is resilient, grows natural capital and delivers long lasting benefits for people.

Audience

This is a technical report for which the main audience is expected to be specialist practitioners, mainly Natural England staff and partner organisations who have been involved in the IPENS project and who have a role in the ongoing management of Natura 2000 sites.

1. Background and context

1.1 IPENS Implementation

Implementation Plan priority actions

1. Develop and agree an implementation plan: Identify existing policies, programmes and other mechanisms which will deliver the priority actions.
2. Establish an AfterLIFE Implementation Steering Group to monitor and oversee delivery of the Implementation Plan. Group to meet for at least two years.

The LIFE+ funded IPENS project concluded in 2015 with the production of a final Programme Report and the 'IPENS AfterLIFE Implementation Plan' which set out plans to implement IPENS findings and secure appropriate management of the Natura 2000 series in the longer-term. It is important to improve the condition of Natura 2000 sites because of the significant contribution they make to achievement of Favourable Conservation Status objectives at a range of scales, from local to international, and the ecological status of the Natura 2000 network as a whole. In addition, the Natura 2000 network holds a wealth of natural capital assets which need to be sustained for the value they have to people through the ecosystem services and benefits they provide such as clean air, flood storage, and amenity.

All IPENS published reports are available on the IPENS section of the Natural England Publications Catalogue. In this report, relevant priority actions from the AfterLIFE Implementation Plan are shown in text boxes at the start of each chapter (as above) and a full list is at Annex 1.

With the IPENS Implementation Plan as its basis, Natural England established a short-term IPENS Implementation Project the aims of which were to:

- prioritise IPENS findings and update the Prioritised Action Framework[1];
- make plans to ensure that implementation of IPENS findings was underway;
- track progress and embed ongoing work into 'business as usual' for future years.

The IPENS Implementation Project was overseen by a project manager reporting to an IPENS Implementation Steering Group (ISG) set up to advise the project. The ISG had agreed terms of reference and was chaired by Natural England's manager for Resilient Landscapes and Seas, meeting twice a year for two years. Membership comprised Natural England and representatives from partner organisation, including Defra, the Environment Agency, Marine Management Organisation, RSPB, JNCC, Wildlife Trusts, Local Nature Partnerships and The Woodland Trust.

[1] The Prioritised Actions Framework (PAF) is required under Article 8 of the Habitats Directive and is a strategic planning tool, reporting to Europe on funding needs, strategic conservation priorities and key measures for Natura 2000 sites at the national and UK scale. See section 2.1. UK organisations will be able to apply for LIFE funding until EU Exit and Her Majesty's Government have agreed to underwrite payment of agreed LIFE projects until they end (pers. comm., Defra).

This report summarises the implementation work undertaken to date, highlighting examples of benefits and successes that are being realised and challenges that are encountered. It is a technical report intended for an audience of specialist practitioners involved in the management of Natura 2000 sites.

Interim success criteria

Full execution of all IPENS findings will take longer than the two years of the Implementation Project, so from the start it was recognised that the purpose of the project was to ensure that implementation was underway. 'Interim success criteria' were agreed with the Implementation Steering Group, against which progress is assessed in this report. This assessment gives a 'snapshot in time' of progress and is to check that the Implementation Project has achieved its aims. The list of interim success criteria is in Annex 2 and assessments against the criteria are found at the end of each chapter.

Experience has shown that factors which have greatly helped delivery include:

- A clear owner or nominated lead for theme plan topics, who has been able to drive forward progress or build it into their ongoing work plan;
- Area Team staff who have a strong vision for the work needed on a site and a good understanding of what benefits IPENS products can offer to their work;
- Stakeholder organisations who are willing to work together with Natural England in strong partnerships to secure new funding or undertake delivery work.

1.2 Delivery challenges

Delivering the actions recommended by IPENS to improve site condition is not always straightforward, with a number of challenges or blockages being encountered nationally and locally by Natural England and partner organisations. Significant or frequently reported issues are covered in this section and topic-specific issues are described in the 'challenges' sections of the following chapters.

Finance and resources

The most significant challenges or blockages to delivery of IPENS findings cited during research for this report across all work areas are those related to limited staff and budget resources. This is not a surprise given the current climate of economic austerity, but is clearly impacting delivery in a number of ways including: a reduced ability to initiate and project manage delivery work locally; tight national focus on 'must-do' actions; reduced ability to increase organisational capacity to resource new delivery work.

Funding budgets are limited and a clear business case and priority are necessary for project ideas to progress. The strict requirements of different funders mean that project objectives often have to be adapted to meet strict funding criteria, for example the inclusion of social elements within a project which has a primary aim focussed on biodiversity. Additionally, securing the necessary match funding for projects to secure grants from the EU LIFE Programme and Heritage Lottery Fund (HLF) is increasingly a challenge and can be prohibitive to projects going ahead.

Changing organisational priorities and resource availability meant that the IPENS Implementation Project itself necessarily became more streamlined over time but implementation progress continued to be made across all work areas. This is both as a direct result of the Implementation Project, and indirectly through wider work by Natural England and partner organisations which contributed to implementation of IPENS findings.

Reasons for on-the-ground change

To date it has been difficult to track the degree of influence IPENS has had on site specific condition improvements. Observed changes may in many cases be due to previously secured actions to improve SSSI condition rather than IPENS, especially for slow to recover habitats or species. For many significant issues IPENS has not provided a new driver for change; where multiple legal or policy drivers already exist, such as coastal management, IPENS itself may have a relatively low-profile. Encouragingly, a number of excellent examples of IPENS facilitating a step-change in the way an issue is managed are emerging, Site Nitrogen Action Plans (Annex 4) being a good example, or in working relationships for example at Marazion Marshes Special Protection Area (SPA) (Chapter 7). With new drivers and opportunities for creating resilient landscapes and seas (see section 1.3) it is hoped that IPENS findings will be increasingly used, good practice will become more widespread and the legacy of IPENS will be clear.

1.3 Changing context

IPENS implementation is happening in a context of economic austerity, shifts in Natural England and Defra's strategic approach to conservation and a time of political change following the UK's EU-exit referendum.

Conservation Strategy

In 2016 Natural England published its new conservation strategy: Conservation 21: Natural England's Conservation Strategy for the 21st Century (C21), which calls for a new approach to conservation in England based on three guiding principles:

- creating resilient landscapes and seas
- putting people at the heart of the environment
- growing natural capital

C21 suggests that these three guiding principles are delivered through co-created shared plans for places and the outcomes approach. Implementation of IPENS findings will support the organisational shifts needed to apply the principles. For example,

- the creation of resilient landscapes and seas will be aided by improving the condition of the Natura 2000 network informed by actions in SIPs and Theme Plans. This will also bring benefits in the wider environment beyond protected sites such as through reducing habitat fragmentation;

- growing natural capital as a result of better functioning ecosystems delivered through these improvements in condition; and

- IPENS products providing part of the environmental evidence base and direction which can be used in developing co-created shared plans for places, which are key to putting people at the heart of the environment.

Examples of this already happening in practice are emerging. The development of an Ecological Networks Handbook (currently in preparation) which had its origins in the IPENS Habitat Fragmentation Theme Plan will contribute to our understanding of resilient landscapes. Pilots of Shared Nitrogen Action Plans (SNAPs) recommended by the Atmospheric Nitrogen Theme Plan and co-created with partners, link with other plans including the Marches Mosses BogLife project and the Defra North Devon Pioneer Project (one of four areas which is aiding development of the Defra 25 year Environment Plan).

25 Year Plan to Improve the Environment – 'A Green Future'

The guiding principles of C21 complement the government's new approach to maintaining and enhancing the natural environment through to 2042, which was published in January 2018 in 'A Green Future: Our 25 year plan to improve the environment'[2] (referred to in this report as the '25 year plan'). The Plan sets out ten 25 year goals which when achieved will greatly protect the wider environment for wildlife and people. IPENS findings are frequently equally applicable to the wider environment outside of Natura 2000 sites and so IPENS implementation could make an ongoing contribution to the achievement of many of the 25 year goals into the future. Chapter 8 provides more information about IPENS products and the 25 year goals.

EU Exit

Regardless of EU Exit, the protected sites network in the UK will continue to contribute to the achievement of domestic and international biodiversity objectives, including Bern[3] and OSPAR[4]. The Bern Convention is of particular relevance to Natura 2000 as EU Member States currently meet their obligations under the Convention by means of the Habitats[5] and Birds[6] Directives and associated domestic legislation such as The Habitats Regulations[7]. The Natura 2000 series of SPAs and SACs constitutes the EU's contribution, required under the Bern Convention, to the pan-European network of Areas of Special Conservation Interest, called the Emerald Network.

On exit from the EU, existing environmental law, including the Habitats Regulations, will be 'rolled over' into domestic legislation under the provisions of the European Union (Withdrawal) Bill, with only minor administrative amendments to make them operable. The UK will continue to be a signatory to the Bern Convention and has committed to honouring its obligations under it, just as it does now. This means that continued implementation of IPENS findings has longer term value as a contribution to our obligations to the Emerald Network, as well as domestic Site of Special Scientific Interest (SSSI) designations which underpin

[2] HM GOVERNMENT (2018) A Green Future: Our 25 year plan to improve the environment.
[3] The Bern Convention on the Conservation of European Wildlife and Natural Habitats
[4] The Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention')
[5] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
[6] Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds
[7] Conservation of Habitats and Species Regulations, 2017

terrestrial Natura 2000 sites. New opportunities for IPENS to influence future protected sites funding or land management mechanisms may also become available.

2. Prioritisation

Implementation Plan priority actions

1. Undertake an exercise to prioritise the actions identified in the IPENS site and theme plans and analyse the synergies. Publish the results as Natura 2000 priorities.
2. Develop and agree an implementation plan: Identify existing policies, programmes and other mechanisms which will deliver the priority actions.
3. Update the England Prioritised Action Framework to reflect priority funding needs.

2.1 Progress

Prioritisation methodology

The prioritisation methodology used three stages of analysis to separately identify 'core Natura 2000 priorities', synergies with other objectives and factors which inform and influence our ability to deliver (Figure 1). This ensured that the results are traceable and approach can be repeated when new data arise.

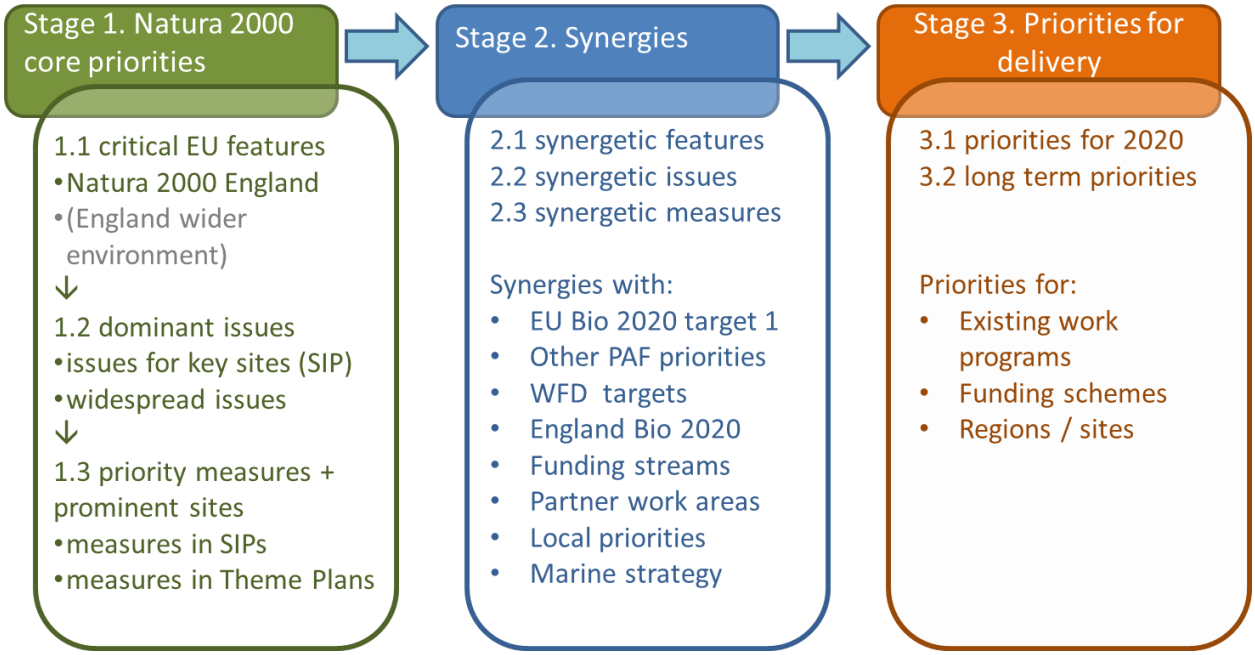

Figure 1 Prioritisation approach

This method resulted in the development of three strategic priorities:

1) Halting and reversing declines of designated interest features within the Natura 2000 network (based on stage 1 analysis);
2) Implementation of Natura 2000 measures that also contribute to other existing objectives and priorities, such as the Water Framework Directive (WFD) and the

England and European Biodiversity targets for 2020[8] (based on Stage 2 synergies analysis);

3) Improving the condition of European interest features for which England's Natura 2000 sites make a particularly significant contribution to achieving favourable conservation status. This is also a longer term priority, associated with the delivery of Defra's 25 year plan.

An overview of priorities is at Annex 3.

Prioritised Action Framework update

IPENS data and priorities were essential to and facilitated the 2016 update of the Prioritised Action Framework (PAF) which is required under Article 8 of the Habitats Directive and reports to Europe on funding needs, strategic conservation priorities and key measures for Natura 2000 sites. The draft PAF was scrutinised by Natural England specialists and underwent a targeted consultation with external partners before being finalised. Following ministerial sign off, the 2016 England PAF was submitted to the European Commission in May 2017 and is now publicly available: http://jncc.defra.gov.uk/default.aspx?page=6934. Positive feedback has been received that the PAF is helping to inform current LIFE funding bids.

Interpreting the priorities

To help make IPENS priorities meaningful for site based implementation, they were each linked to the individual Natura 2000 sites to which they are relevant (via those features for which the site is designated). This initial geographical link then enabled them to be associated with administrative boundaries such as Natural England Area Teams and delivery focus areas. The information was made available to Natural England staff and partner organisations via the Implementation Steering Group, as a resource to inform conservation planning. Communication activity subsequently happened to ensure that Natural England staff are aware of the updated PAF, IPENS priorities and the interpretation spreadsheet.

2.2 Challenges

The PAF identifies priorities for Natura 2000 and is a key tool in developing external funding bids in particular LIFE. However, there is some tension between the approach envisaged by the European Commission whereby funding bids would be developed based on the priorities included in the PAF and the reality of how successful funding bids arise. Funding bids are often developed for multiple purposes, as opportunities and partnerships arise, rather than through a programmed Natura 2000-focussed approach. As a result, the main focus of some project bids can be on secondary factors affecting sites, meaning that key PAF priorities may be retrofitted and so not addressed as adequately or thoroughly as needed.

2.3 Next steps

PAF priorities will continue to be used by Natural England's External Funding team and partner organisations to support bids for LIFE funding whilst this is available to the UK. The PAF is also available to inform the prioritisation of project bids to other funding sources eg

[8] DEFRA (2011) Biodiversity 2020: A strategy for England's wildlife and ecosystem services. Department of Environment, Food and Rural Affairs.

Heritage Lottery Fund (HLF), by Natural England and partner organisations both now and after EU Exit. As the PAF provides a strategic overview of how funding could be targeted, in view of EU Exit the PAF is also likely to be a helpful tool in deciding where to target future environmental land management schemes. Future use of the PAF for this and other work areas will be communicated through the IPENS Exit Strategy (Chapter 8).

2.4 Assessment against success criteria

Prioritisation		
Criteria	**Complete?**	**Outcome**
IPENS priorities established and available to staff and partner organisations	Yes	IPENS priorities have been developed, are publicly available via the JNCC website and have been made available to Natural England staff and partner organisations as a spreadsheet which links priorities to Natura 2000 sites, and administrative and delivery priority areas. The availability of PAF priorities means that they are starting to inform funding bids by Natural England and partner organisations.
Final copy of revised England PAF approved by Natural England and submitted to Defra.	Yes	Revised England PAF was submitted to Defra in 2016 and received ministerial sign off in May 2017. It has subsequently been submitted to the European Commission.

3. Making a difference to sites

Implementation Plan priority actions

1. Embed the agreed priorities within NE and EA organisational delivery plans (local and national). Influencing planning cycles and alignment of resources with others where possible.
2. Ensure successful migration of IPENS database into the Conservation Management System (CMSi).
3. Ensure that Natura 2000 data in CMSi is kept up-to-date so that it accurately reports against the actions in it and can be used to help monitor implementation.
4. On an annual basis re-publish (on Natural England's publications catalogue) any Site Improvement Plans (SIPs) where there has been an update

3.1 Progress

Natural England's work programmes include action for domestic (Sites of Special Scientific Interest; Marine Conservation Zones) and international (Natura 2000; Marine Protected Areas) sites. To ensure that IPENS findings are implemented at the site level, they need to be incorporated in the local delivery plans for protected sites drawn up by Natural England's Area Teams. Several ways of doing this have been pursued:

- As described in chapter 2, the importance of using IPENS priorities linked to Natura 2000 site and administrative boundaries in organisational delivery plans has been communicated to Natural England staff through a series of internal news articles.

- Responsibility for Site Improvement Plans (SIPs) has been delegated to Area Team staff, who are encouraged to use them alongside Natura 2000 priorities to inform site based delivery planning. This has been communicated via protected site lead contacts and was embedded in integrated delivery advice in 2016.

- To facilitate the incorporation of IPENS outcomes into day-to-day site management by Natural England and partner organisations, the SIP database has been uploaded to the CMSi 'Designated Sites View' system (a component of Natural England's database for protected site information which allows simple viewing and reporting functions) and linked to each Natura 2000 site and underpinning SSSI.

Natural England Area Teams are using the priorities interpretation information to inform their delivery planning. Importantly, this links Natura 2000 priorities to 'focus areas' which are the areas in which local delivery effort is being concentrated at a landscape scale. Alongside the Natura 2000 priorities, SIPs are seen by many Area Teams as an important information resource to plan improvements on individual sites and to inform casework. In the best examples SIPs are being used to transform delivery on the ground (see Barnack Hills and Holes case study, overleaf). We also know that SIPs are being used by Area Teams in discussion with the Environment Agency as evidence to support bids for Water Company environmental funding through the Periodic Review process (PR19).

In addition to SIPs for individual sites, SIP data are available in a database which can be interrogated to extract topic-based datasets. These are starting to be used by Natural England specialists to inform national policy which can then be applied at the site level (see Invasive non-native species policy case study).

Case study: Barnack Hills and Holes SAC – planning development

A planning application was submitted to Peterborough City Council for a housing development close to Barnack Hills and Holes SAC, an important orchid site (H6210[9]). Natural England considered that the resulting recreational pressure was likely to have an adverse effect on the conservation interest of the SAC which would not be sufficiently offset by the provision of green infrastructure within the development. In discussions with the developer about further mitigation the SIP for Barnack Hills and Holes SAC was referred to, to get ideas of potential actions and costings. The developer agreed to fund a series of SIP measures through a section 106 agreement[10]. Detailed plans are currently being prepared, starting with the design of on-site green infrastructure which will include habitat creation to replicate the landscape and habitats of the Barnack Hills and Holes SAC.

"Hills and Holes" by Dave Crosby is licensed under CC BY 2.0

Case study: SIP analysis informs invasive non-native species policy

Analysis by Natural England invasive species specialists showed that sixty-two percent of Natura 2000 Site Improvement Plans reported adverse impacts from invasive species, including non-native species, deer, pests, disease and competitive natives. Using this information allowed us to prioritise the key invasive species impacting on terrestrial, freshwater and marine protected sites to produce a series of internal position statements. These are intended to help staff evaluate the level of support Natural England should be giving to invasive species control initiatives. The statements include a description of the species, the key risks and impacts, feasibility of control, legislation and Natural England's position on controlling the species. Examples include, Himalayan balsam, signal and other non-native crayfish, rhododendron, Pacific oyster and New Zealand pygmyweed.

New Zealand pygmyweed, *Crassula helmsii* © GBNNSS

3.2 Challenges

The original intention was to update and re-publish SIPs annually, by uploading them as 'live' data on the main CMSi system where staff could edit it as required. In practice this has proved not to be possible in the short term, largely because of the significant resource it would require to translate the data from 'SIP' scale to the SSSI unit scale. Instead, a small number of SIPs have been updated on the bespoke database and re-published where there

[9] Habitats Directive interest feature code.

[10] Planning obligations under Section 106 of the Town and Country Planning Act 1990 (as amended), known as s106 agreements, are a mechanism which make a development proposal acceptable in planning terms, that would not otherwise be acceptable. They are focussed on site specific mitigation of the impacts of development.

were business critical reasons to do so. In the majority of cases, however, staff have instead been encouraged to ensure that SIP information is accurately reflected on the CMSi system for the underpinning SSSIs, so that the information on management requirements is available in Natural England and to partners through that route. This will continue to be the approach followed unless a strong business case and new resources align to make 'live' SIPs a possibility.

The consequence of this is that at present progress against SIP actions cannot be easily monitored, other than through individual case studies. Changes in condition for the SSSIs which underpin Natura 2000 sites can be tracked on CMSi, but are dependent on a wide range of drivers and factors including national biodiversity objectives and management measures of which the influence of IPENS is a small element. Additionally, the benefits of IPENS implementation are likely to be realised over a long period of time so are not likely to be significantly reflected in site condition two years after the close of the project. The changing condition of SSSIs underpinning Natura 2000 sites is not therefore a sound metric to use as a surrogate for improvements to Natura 2000 sites resulting from IPENS implementation. It is clear there is still a lot of work to be done, and it is hoped that by building the use of IPENS output into 'business as usual', it will continue to influence an ongoing positive trajectory in condition improvement.

3.3 Next steps

Experimental development work began in 2016 to explore options for integrating data across different nature conservation designations in the CMSi system starting with National Nature Reserves (NNRs). The ultimate aim is to see whether CMSi can be made into a single database for planning and reporting at different tiers of protected area designation. This work has trialled a process for automating the upload of information held in SIPs, such as issues, project plans, timings and costings, into CMSi. These can be linked to relevant NNRs and potentially to underpinning SSSIs. Reports can be produced which could be used to check whether NNR management plans (or SSSI management) will deliver SIP actions or to monitor progress against SIP actions.

With further refinement and resources this might in the future enable the whole SIP database to be uploaded to the main CMSi system in an editable format. SIP information could be edited live, SIP documents downloaded, and reports made available outside of Natural England for use by partners.

Resources allowing, a further direction in which to develop SIPs might be to include information about the natural capital assets of each site, the ecosystem services they provide and where possible economic values associated with these. Natural England's Conservation Strategy and Defra's 25 year plan both indicate a general move towards the use of a natural capital approach in England, and the SIPs could be usefully adapted to provide readily accessible information of this type in an easy to use format.

3.4 Assessment against success criteria

Site Improvement Plans		
Criteria	**Complete?**	**Outcome**
The original SIP database is available within Natural England and externally via the Designated Sites View system.	Yes	The original SIP database has been uploaded to the Designated Sites View system and is available for Natural England staff and Major Landowner Group partners to view and extract basic reports.
Good examples of how SIPs are being used and the difference being made.	Yes	See example case studies above.
A process for uploading SIP actions to the main CMSi system (enabling live updates) has been agreed and tested on a sub-set of priority SIP data.	in progress	A prototype approach for automatically uploading SIP data to CMSi has been developed and tested. Organisational agreement and additional resources would need to be secured to refine and fully implement the system.

4. Making a difference to issues

Implementation Plan priority action

1. Pilot (as appropriate) the new mechanisms and approaches identified in the IPENS theme plans.

4.1 Progress

The IPENS programme produced eleven 'Theme Plans' which recommend approaches to address significant issues which affect many Natura 2000 sites and which would benefit from a strategic, rather than site-by-site approach. These same issues are also likely to act on non-Natura 2000 protected sites, such as SSSIs, and across the wider resource of priority habitats and species outside the protected sites network. Progress on these themes is therefore instrumental to address generic risks to England's biodiversity ambitions across land and sea. Because of this wider relevance, implementation has focussed on incorporating Theme Plan recommendations into new and on-going initiatives throughout the conservation community. This is done by Theme Plans lead contacts in Natural England, often specialists on the subject, through the programmes and partnerships they lead or are involved in.

The Theme Plan topics, with links to progress information in Annex 4 are:

Atmospheric nitrogen	Hydrological functioning
Climate change	Invasive species
Coastal management	Lake restoration
Diffuse water pollution	Public access and disturbance
Grazing	River restoration
Habitat fragmentation	

The IPENS Implementation Project provided a national oversight of Theme Plan implementation, encouraging the incorporation of recommended actions in programmes and plans and the reporting of progress to the Steering Group. Annex 4 provides a summary of activity for each theme plan and two example case studies follow in this chapter. Some Theme Plans drew together the strands of strategic approaches that were already developing, to provide greater focus for future implementation, for example coastal management and river restoration. In contrast, a number of Theme Plans proposed new and innovative mechanisms to address longstanding issues, which require development, piloting and an adaptive approach to operational implementation, in collaboration with partners. As such the IPENS programme is contributing to a step change in how some longstanding issues are being addressed.

Good progress is being made with implementation of recommendations across all eleven Theme Plan topics, including development of new solutions and influencing policy. All Theme Plans have nominated lead contacts in Natural England who in some cases have established working groups including partner organisations.

Case study: Atmospheric Nitrogen Theme Plan – Incentivising farms to reduce ammonia emissions

A priority action of the Atmospheric Nitrogen theme plan was to harness wider options to reduce atmospheric nitrogen impacts on protected sites. To do this Natural England worked closely with Defra on the development of incentives used to increase the uptake of measures to reduce the impacts of ammonia emissions. The Countryside Stewardship Scheme offers a range of options that can reduce or capture ammonia emissions, such as covers for slurry stores and lagoons and woodland creation to produce pollution buffers.

Supported by Natural England, Defra led a study into potential 'Remedies' for Air Pollution Impacts on Designated Sites (RAPIDS) and a one-off initial grant called the Farming Ammonia Reduction Grant (FARG) scheme.

- RAPIDS identified potential solutions for air pollution impacts on designated sites. It demonstrates that local targeting of measures is a cost effective approach to reducing atmospheric nitrogen impacts on protected sites. This may include technical measures to reduce emissions from sources or landscape methods (eg tree belts) to influence pollutant dispersion and recapture of pollutants.
- FARG was a 2016/17 capital grant scheme which provided 100% funding for slurry store covers on dairy units together with one-to-one advice on ways to reduce ammonia emissions and conserve nitrogen.

Floating slurry store cover © Natural England, Chris Turner

Case study: Lake Restoration Theme Plan – Assessing the scale of impact of fishery management on standing waters

Imbalances in fish communities are identified in the Lake Restoration theme plan as a key reason for poor condition. Around 130 SSSI standing waters in SSSIs and Natura 2000 sites are known to support a recreational fishery or to have been stocked with fish at some time, of which around 50 are in unfavourable condition and have identified the fish assemblage and/or fishery management as a potential contributor to poor condition. A contract was let in 2015 aiming to undertake detailed fish surveys and produce fish density estimates in 22 lakes considered to be at risk from fisheries management related impacts. Surveys were conducted in 2015.

Individual summary lake management plans were produced for the lakes surveyed, outlining the likely role of fish relative to other stressors in determining lake condition. In addition, the outcomes of the site surveys were used to assess and ground-truth the effectiveness of newly developed e-DNA fish monitoring techniques.

Project output has been published: Designing a methodology for surveying fish populations in freshwater lakes (NECR230). Individual site reports have been provided to local Natural England and Environment Agency staff and local angling clubs to inform fishery management decisions at each site. Project outcomes were presented to the Institute of Fishery Management at its annual conference.

Perch caught during lake survey. © Richard Berridge, ECON Ecological Consultancy Ltd

4.2 Challenges

Implementation of Theme Plan recommendations is clearly underway and good progress is being made in many areas, despite constraints of staff time which in some cases has meant that implementation is not as far progressed as was originally hoped by this stage. Despite this, the good progress made so far suggests that Theme Plans are continuing to have a significant influence on work in these topic areas.

A number of specific challenges have been encountered, including: data licensing conditions restricting dissemination of some mapped output; voluntary uptake of agri-environment schemes resulting in a slow pace for improving habitat connectivity; difficulties in getting novel schemes off the ground; complexity of recommended actions leading to slow delivery progress; and lack of theme plan visibility in partner organisations where a work area is dominated by existing delivery drivers.

4.3 Next steps

Theme plan recommendations will become part of Natural England 'business as usual' following the close of the Implementation Project. In most cases theme plan work will be absorbed into the remit of the relevant national specialist staff. In other instances implementation will be the responsibility of Area Teams, with oversight being an organisational responsibility. Where work is closely aligned with partner organisations, they will continue to have a role in implementing theme plan recommendations, such as the Environment Agency for coastal risk management and diffuse water pollution. Further detail is given in Chapter 8: Ensuring sustainability of actions.

4.4 Assessment against success criteria

Theme Plans		
Criteria	**Complete?**	**Outcome**
Demonstrable progress has been made between 2015-2018 with implementation of some or all of the priority actions for each theme plan.	Yes	Information in Annex 4 demonstrate that progress is underway to implement some actions for all theme plan topics. Based on feedback from theme plan lead contacts, it is estimated that between 45 and 94% of actions are underway across the theme plans.
For appropriate theme plans, 'on the ground' progress can be demonstrated.	Yes / In progress	On the ground progress can be demonstrated through: - Testing approaches on pilot sites – eg Shared Nitrogen Action Plan pilots; application of climate change site based assessments to a subset of SACs; trialling approaches within Natural England's Landscape Scale Delivery Change Plan Pilot sites (Habitat Fragmentation). - Application of new advice eg use of invasive species position statements by Area Teams to aid delivery planning. - Adoption of theme plan recommendations within existing action plans or work programmes eg Diffuse Water Pollution Plans; River Restoration Plans; Lake Restoration Plans; coastal management.

5. Evidence and Funding

Implementation Plan priority actions

1. Ensure the IPENS evidence findings inform the Natural England, Environment Agency and Defra evidence programmes.
2. Feed into the Natural England External funding Strategy (Sept 2015) with priorities for funding on Natura 2000 sites and features. Link this to the Prioritised Action Framework.
3. Inform the Terrestrial Biodiversity Group (TBG) 'pipeline' of conservation projects to be submitted to external funding streams (such as LIFE, Heritage Lottery Fund) to ensure Natura 2000 objectives/requirements are considered.

5.1 Progress

The IPENS programme invested over £1 million in evidence contracts to fill gaps in knowledge about Natura 2000 sites. Where possible, reports have been published and are available online: http://publications.naturalengland.org.uk/category/6337991412809728. Additional evidence gaps recorded in SIPS and theme plans were collated into an Evidence Gap Log (IPENS077). The IPENS implementation project made this available within the organisation to inform decisions about allocation of funding to fill these evidence gaps. It is also available publicly via the link above for use by partner organisations.

Benefits of IPENS evidence projects

Project managers of IPENS funded evidence projects were invited to share benefits and successes resulting from the projects they ran. The 40 responses (73%) received provide a good insight into the wide range of benefits gained and new work that has been instigated following the conclusion of the original projects. Three of these are illustrated in case studies in this chapter and the full list of responses is in Annex 5. Examples of things we know now as a result of IPENS funded evidence projects include:

- Which SACs will benefit most from local ammonia reduction measures;
- Confirmation that native crayfish are still present in the upper River Dove catchment;
- That there is a correlation between moorland burn distribution and breeding merlin in the North York Moors;
- Threats, trends and locations of Desmoulin's whorl snail populations.

Natural England External Funding Strategy

Natural England's ambition is to grow the amount of income received through grant funding. We plan to do this through large scale bids driven by national priorities, complemented by locally led funding initiatives which will access funds to support delivery of conservation outcomes. The early focus for this has been on contributions to delivery of Biodiversity 2020 targets[7], which in many cases complement Natura 2000 objectives. A new Natural England External Funding Strategy for 2015-2020 was produced, which sets out Natural England's ambitions and provides direction in this regard. The strategy clearly articulates the

importance of IPENS evidence as a resource to guide Biodiversity 2020 priorities and partnership working.

Case study: IPENS 035 North East Kent pacific oyster survey

IPENS provided £6,000 to monitor pacific oysters in the North East Kent European Marine Site. The project has been particularly beneficial in providing the evidence to underpin the active on-ground management of the invasive pacific oyster within the North East Kent Marine Protected Areas. The evidence has enabled the management to be targeted in delivery and based around risk, which is critical when trying to manage marine invasive species on such a large scale.

Pacific oysters interacting with blue mussels. © Natural England / Ingrid Chudleigh

Case study: Humber Estuary Bird Population Change Investigation

IPENS funded an information review to identify drivers of bird population change, a recommendation of which was to investigate how birds are using estuary habitats. A bird tagging study was subsequently funded by Natural England's Innovation and Partnership fund and proved to be a real success. The study was supported by a partnership including RSPB, the Yorkshire and Lincolnshire Wildlife Trusts, BTO, Humber Nature Partnership, Hull University and the Humber wader ringing group. Operation of the tags exceeded expectations in terms of longevity and quantity of data. The 'proof of concept' aspect of the project was realised and provided excellent data, albeit a small sample, indicating how waders are using managed realignments sites and functionally linked land in the Humber. The partnership nature of the work improved relationships and work is underway to use the project outputs to support funding bids to both industry and academia.

Common redshank. © Natural England / Allan Drewitt

Influencing national priorities for funding

In 2015, the IPENS implementation project contributed to a workshop for partner organisations on funding priorities for Biodiversity 2020. The ambition was to unite the conservation sector around priorities for external funding bids to enable under-utilised funds (especially for HLF and LIFE) to be accessed in a co-ordinated way. Evidence gaps

highlighted by IPENS and the developing Prioritised Action Framework were used to inform discussions.

The Defra chaired Terrestrial Biodiversity Group (TBG) (which oversees strategy and delivery of England's Biodiversity 2020 objectives) subsequently convened an External Funding Task and Finish Group which refined priority themes into a pipeline of HLF and LIFE+ project bids. These include 'Dynamic Dunes', an £8 million HLF and LIFE partnership project between Natural England, National Trust, Plantlife, Wildlife Trusts and Natural Resources Wales, focussed on dune and coastal floodplain grazing marsh systems. The HLF bid was successful and the project is now in a start-up phase, working on nine sites in England and Wales. Projects are also being developed for further priorities including woodlands and peatlands.

Case study: IPENS 053 'River Mease impact of road network' evidence project

IPENS contributed £40,000 to a sediment fingerprinting and water quality study to assess the effects of road derived run-off on the River Mease SAC. The evidence generated by this project confirmed that road drainage is impacting the integrity of the River Mease SAC. As a result and following feasibility work, Highways England recently committed to improving the water quality from drainage of the A42.

The same evidence project also enabled Natural England to fund a Sustainable Urban Drainage (SUDS) retrofitting feasibility report, focussing on Ashby de-la Zouch. One site identified in this report has already had a detailed design completed with planning permission being sought this year. Our partners in the catchment have committed to securing funding for and delivering the scheme next year. Natural England funded £18,000 for the feasibility/detailed designs. The estimated cost of delivery will be around £90,000.

Water crowfoot near Croxhall, River Mease Site of Special Scientific Interest, Staffordshire. © Natural England/Paul Glendell

Influence of IPENS on large external funding bids

A significant number of project bids have been made by Natural England and partner organisations during the period of the original IPENS project and up to 2017. An analysis of the number of external funding bids which have referenced IPENS data and whether or not they have been successful is presented at Annex 6. This information indicates that since 2013, IPENS has influenced and / or Natura 2000 will directly benefit from approximately £86

million funding, much of which is from external sources such as EU LIFE+ and the Heritage Lottery Fund.

Additionally, two large projects are expected to have indirect benefits for Natura 2000 sites. These are:

- 'Natural Course' LIFE Integrated Project (>€20 million) led by the Environment Agency will build capacity to protect and improve the water environment in the North West River Basin District and is likely to have indirect benefits for Natura 2000 rivers and estuaries in the area.

- 'Back from the Brink' is one of the most ambitious conservation projects ever undertaken in England. Its aim is to save 20 species from extinction and benefit over 200 more through 19 projects. It is being run as a collaborative partnership of Natural England and seven conservation charities and has secured £4.6 million HLF funding towards a total project budget of £7.7 million. Work will focus in 7 landscape scale 'integrated projects' and 12 species recovery projects which will benefit Natura 2000 sites in five areas and three Natura 2000 interest features.

Locally led funding initiatives

The influence of IPENS findings on the many locally led funding initiatives that are developed by Natural England Area Teams and partner organisations is less easy to collate. Some information is, however, starting to emerge, as a result of SIPs and IPENS funded evidence projects which have led to opportunities to secure new funding, or through the analysis of SIP data to inform funding requirements for National Nature Reserves, as illustrated in the case study overleaf.

5.2 Challenges

It can be a challenge to balance clear conservation priorities in a bid with other aspects such as cultural heritage or public engagement, which may be required in order to fulfil funding criteria. The impact of this and difficulties in securing match funding has already meant that some national priority projects identified by the TBG have had to be redesigned. This can perhaps be better addressed in the future by ensuring that a more holistic approach is taken to identifying project ideas, with a clear articulation of the broader natural capital benefits to be realised through such investment, to make sure they are a more natural fit to available funding sources, whilst still addressing priority conservation issues.

5.3 Next steps

The output from IPENS funded evidence projects is likely to inform site based work into the future, as illustrated by the above case studies. Nationally, Natural England's External Funding team will continue to use IPENS data to help shape project bids to domestic funders into the future. Increasingly, Natural England and partners are exploring opportunities for alternative funding sources, such as payments for ecosystem services, payment for impacts and corporate and public finance. IPENS data will also help to inform this area of work.

Case study: Planning for National Nature Reserves using SIPs

A dataset was extracted from SIPs showing projects and costings relating to Natura 2000 sites which are also National Nature Reserves (NNRs). This was to inform an external funding pipeline for NNRs and to illustrate which NNRs could be considered for the various national and partnership HLF and LIFE externally funded projects being developed. Whilst the exercise hasn't yet progressed further at a national scale, the information will be used to inform local discussions about Area Team or landscape scale funding pipelines, with local partners and NNR approved bodies and in the context of the NNR Strategy and Natural England's Conservation Strategy.

Clearing willow scrub in the freshwater marsh of Saltfleetby-Theddlethorpe Dunes NNR. Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC. © Natural England/Peter Roworth

Importantly, there is an opportunity for IPENS data to be used as a key evidence resource for post-EU Exit protected sites funding for example via a new environmental land management scheme or a bespoke protected sites fund. If there is to be a domestic scheme to replace LIFE, IPENS could continue to provide a useful steer on prioritisation. The information already gathered provides evidence for what such a programme can deliver and therefore why it is important to have a scheme like LIFE.

5.4 Assessment against success criteria

Evidence and Funding		
Criteria	**Complete?**	**Outcome**
IPENS information has contributed to successfully securing external funding by Natural England and partner organisations.	Yes / ongoing	IPENS has successfully helped to secure considerable amounts of external funding for large national scale projects and locally led initiatives. See detail in Annexes 5 and 6. The influence of IPENS in this area will be ongoing
Benefits of successful bids for Natura 2000 sites can be demonstrated.	Yes	See Annex 6 for commentary on benefits gained / expected from successful bids.

IPENS evidence is being used.	Yes / ongoing	See chapter 7 for information on Dissemination of IPENS Documents and publication download figures. Case studies throughout this report highlight good examples of how IPENS evidence is being used.
New IPENS-related evidence is being generated and shared.	Yes / ongoing	See section 7.1 for information about peer reviewed journal articles, reports published / in progress and conferences or workshops which have resulted from IPENS implementation work.

6. Addressing skills and capability gaps

Implementation Plan priority action

1. Undertake a review of the Natura 2000 resource and skills currently available in the environmental sector and develop a plan to address any shortfall.

6.1 Progress

The issues and actions recorded in SIPs made it clear that successful management of the Natura 2000 network is reliant on the skills and capacity of staff throughout the environment sector. The experience of stakeholders indicates that positive change in the condition of protected sites mainly occurs when experienced conservation officers are in place and that barriers to effective sharing of expertise and knowledge can hinder progress. A sector wide review of Natura 2000 resource and skills has not yet been undertaken, but a number of work areas are already helping to address shortfalls.

Natural England

An early IPENS finding was that due to the loss of experienced ecologists through retirement and staff turnover, the specialist ecological skill base of Natural England was eroding. This information formed a vital part of the business case for a new Natural England Field Unit (NEFU). The purpose of NEFU is to build capability within the organisation to deliver environmental objectives, by upskilling and confidence-building in ecological expertise. This is done by developing NEFU staff themselves, and other Natural England staff through the provision of NEFU led training courses which are flexible in response to local development needs. Now in its third full year, Natural England has continued to recruit staff and external candidates who spend a year with the NEFU before returning to Area Teams as part of an alumni group. NEFU now has a pool of 50 – 60 current and alumni staff, whose expertise the organisation can draw on.

In 2015/16 NEFU ran approximately 80 training courses, equating to 1,000 staff training days, with a further 50-60 courses in 2016/17. Many courses are relevant to Natura 2000 sites or designated features, including bird survey methods and training on Habitats Directive Annex II species and some have been held on Natura 2000 sites.

Working with partners

The training courses offered by NEFU are also benefitting partner organisations and local volunteer groups, who are able to join courses where appropriate. Staff from Wildlife Trusts, the Environment Agency, Internal Drainage Boards, MOD, National Parks and Local Authorities have attended courses to date, as well as local volunteer groups. This provides invaluable networking opportunities as well as facilitating the sharing of skills across the sector. NEFU staff have also been trained to assess the Field Identification Skills Certificate (FISC) qualification, which is open to external trainees and organisations.

Case study: Natural England Field Unit invertebrate training

Fenn`s, Whixall, Bettisfield, Wem and Cadney Mosses SAC is internationally important for H7110 Active raised bog and H7120 Degraded raised bog still capable of natural regeneration. An invertebrate assemblage of over 1,700 species is an integral component of the H7110 Active raised bog designation. The site hosted a NEFU led invertebrate training course which was attended by a mixture of Natural England staff and local volunteers. It looked at specific habitats important for invertebrates and discussed management techniques at a macro and micro level. Three species of importance were found: the large heath butterfly (*Coenonympha tullia*), a flagship species restricted to bog and mire where it depends upon cotton sedges (*Eriophorum* species) to breed, and cross-leaved heath (*Erica tetralix*) on which to nectar; the very restricted cranefly *Idioptera linnei* which is only found in boggy pools with sphagnum mosses; and the extremely rare window-winged sedge caddisfly (*Hagenella clathrata*) which is restricted to a handful of sites across England. Participants considered the precise conditions needed for the conservation of these species. They talked about the challenges of small-scale management for very rare species within landscape scale management for a more general fauna, when 'broad brush' approaches may be detrimental to habitat at the small scale for very rare or restricted species.

© Kirsty Brown

In work facilitated by the SSSI Major Landowners Group, Natural England is starting to explore how partners with strong ecological expertise can share that resource to make site survey work more efficient. Pilot work is underway with Ministry of Defence: Defence Infrastructure Organisation (DIO) ecologists at Salisbury Plain SAC/SPA to undertake field surveys which will inform the SSSI condition assessments made by Natural England. In parallel with this, Natural England is also piloting the use of an iPad app-based survey tool (NESS) with the DIO ecologists, with a view to potentially offering it to other partners in the future.

The DIO Ecology team welcomed the opportunity to undertake field surveys in support of the Salisbury Plain SSSI Integrated Site Assessment in 2017, especially as it complemented work they were already doing to confirm that MOD investment in SSSI management is moving the site towards favourable condition. Using the iPad based NESS app made the survey quicker and easier and the team found them easy to use in the field. It is hoped that close collaboration between local Natural England and DIO staff will mean the pilot can be extended to other MOD sites in 2018.

Engaging the public

Recent successful external funding bids to the Heritage Lottery Fund are providing new opportunities to engage with the public about the conservation of Natura 2000 sites, habitats and species. Raising the awareness of local communities and landowners will help to inspire people to protect important habitats and species in their local environment for the future. Examples include:

- The Shad-Severn HLF project will work with local communities and schools to reconnect millions of people with the natural, cultural and industrial heritage of the River Severn. A major citizen science programme will get people involved in preserving twaite shad (*Allosa fallax*) and will raise awareness of UK river systems.
- Back from the Brink HLF project is working with landowners, communities and volunteers to inspire a movement of people to discover, value and take action to save England's threatened species. As well as land management training and volunteer mentoring, a film festival and community arts projects are planned.

6.2 Challenges

As the examples above show, Natural England and partner organisations are rising to the challenge of resource limitations through closer cooperation and innovation. Into the future, the Government's strategic direction for the environment and Natural England's Conservation Strategy will set more challenges and opportunities for skill building. As well as needing ecological expertise, the direction set by the Conservation Strategy and 25 Year Plan indicates that if we are to achieve a step change in the way we protect and manage biodiversity, that there will be an increasing need for a wider suite of skills within the environmental community.

6.3 Next steps

Natural England is putting in place learning and development resources for staff around the three Conservation Strategy principles of creating resilient landscapes and seas, putting people at the heart of the environment and growing natural capital. At the same time it is recognised that many environmental NGOs and other partner organisations already have significant relevant expertise and so the need for enhanced cooperation across the sector is acknowledged.

A Conservation Strategy change support programme has been established which looks at big changes that will give the greatest chance of a positive impact on the environment. Natural England is working with partners in five pilot focus areas to develop basic reform proposals and adapt them according to local situations and new opportunities. The pilot

focus areas include a number of Natura 2000 sites and species which will benefit from the shared plans that are being developed. These include Plymouth Sound and Estuaries SAC, Culm Grasslands SAC, Craven Limestone Complex SAC and the Greater Horseshoe Bat (*Rhinolophus ferrumequinum*).

6.4 Assessment against success criteria

Skills and capability		
Criteria	**Complete**	**Outcome**
Measures are being taken to improve ecological skills and capability within the environmental sector	Yes / ongoing	Natural England is taking steps to increase the ecological skills of its staff via the NEFU, and efforts to share expertise across the sector are starting.
Opportunities for increasing public awareness and capacity building have been provided.	Yes / ongoing	Training courses; public engagement via HLF funded projects such as Back from the Brink. The increasing focus on development of shared plans under the Conservation 21 Strategy will build on existing initiatives for public and partner involvement and may bring new opportunities.

7. Communication and working with partners

Implementation Plan priority actions

1. Develop a communications strategy to ensure:
   - ongoing awareness raising of Natura 2000 and the work that the AfterLIFE Steering Group and others are doing to implement the priority actions; and that
   - Natura 2000 evidence and good practice is more widely and easily accessible.

2. Work with stakeholders to identify who can lead on the priority actions and who else needs to be involved.

7.1 Progress

Communication Plan

The Communications Plan outlined in the IPENS AfterLIFE Implementation Plan has been maintained as a live document. Progress against each communication objective is shown in Annex 7.

Dissemination of IPENS documents

IPENS documents that could be made publicly available are published on the Natural England publications catalogue. Data showing the number of internet downloads of each document were obtained on 8 August 2017 and illustrate that this method of disseminating IPENS findings has been highly successful. Total download figures for the various types of reports are shown in the table below:

Type of document	Total number of downloads to 08/08/17 (maximum; mean)
IPENS Programme report (IPENS601)	1482
Site Improvement Plans	117,584 (1539; 452)
Theme Plans	8862 (1573; 806)
Evidence reports	26,190 (3191; 672)

Some of the higher download figures are for documents relevant to sites which have had recent media coverage, sites where staff are being recruited, and topics which are currently receiving a lot of attention from partner organisations and / or government (eg diffuse water pollution and atmospheric nitrogen).

Journal Papers, Conferences and Workshops

Delivery work contributing to the implementation of IPENS theme plan findings is being disseminated widely through journal papers and other publications, academic conferences and informal workshops. Work to deliver the Atmospheric Nitrogen theme plan and the developing methodology around Site Nitrogen Action Plans has resulted in the most academic activity, largely through partnership effort, involving Natural England, the other Statutory Nature Conservation Bodies, JNCC, the Centre for Ecology and Hydrology, Defra, the Environment Agency and academia. It includes publication of a nitrogen decision framework, presenting the Atmospheric Nitrogen theme plan to an Atlantic Region Natura 2000 Seminar in October 2016, and leading a SNAP topic session at a Plant Life workshop, funded by the British Ecological Society in January 2017.

Examples from other theme plans include the publication of five phases of Small Sewage Discharge research (document references: NECR170, 171, 222, 179 and 221) which relate to the Diffuse Water Pollution theme plan; organisation of two sessions on 'Ecological network models: development and application' at the EcoSummit Conference, Ecological Sustainability: Engineering Change, 29 August to 1 September 2016 in Montpellier, France, by staff involved in the Habitat Fragmentation theme plan; and publication of research relevant to the Public Access and Disturbance theme plan about the impacts of marine recreational activities on Marine Protected Areas. A Natural England research report which summarises the work undertaken to apply the methodology recommended in the Climate Change theme plan is also in preparation.

Implementation Steering Group

The IPENS Implementation Steering Group (see section 1.2) has convened twice a year since autumn 2015. The Steering Group advised the direction of the implementation project, including the prioritisation of IPENS findings and production of the Prioritised Action Framework. Steering Group members were responsible for promoting IPENS implementation within their own organisations and with other stakeholders. They also advised the prioritisation process and the updated Prioritised Action Framework document.

The Environment Agency were partners in the original IPENS LIFE project and the Steering Group. They supported the use of SIPs as a source of information to inform their work on water dependent Natura 2000 sites and particularly highlight their value in:

- Underpinning the second cycle of River Basin Management Plans (RBMPs) required under the Water Framework Directive. Links to the published SIPs were included in each RBMP and thereby provided a basic programme of measures for protected sites.

- Informing the development of the Natural Environment Programme for the water industry periodic pricing review (PR019) which will make significant investments in environmental improvements from 2020 - 2025. A download of SIP actions relevant to water companies was used as a starting point for local discussions between the Environment Agency and Natural England and in evidence gathering to leverage investment.

The Royal Society for the Protection of Birds (RSPB) have been an active member of the Steering Group. They contributed to some theme plans during the IPENS LIFE project, and have subsequently used them to initiate conversations with partners and formulate policy positions. In particular the RSPB have sought to engage closely with the implementation of the invasive species theme plan. IPENS SIP actions have been shared across the RSPB to ensure they are available to inform reserve management where relevant. Examples of SIPs in action reported by the RSPB include:

- Confirmation in the Ouse Washes SIP that an additional 500ha of replacement habitat would be needed to restore Ouse Washes to favourable condition. The SIP aided relationships with the Environment Agency locally, resulting in the establishment of a multi-stakeholder strategic group to consider Ouse Washes issues.
- Utilisation of SIP evidence by District Councils in Suffolk to inform their draft Recreational Avoidance and Mitigation Strategy (RAMS) Supplementary Planning Document, to ensure the Local Plan is compliant with the requirements of the Habitats Regulations 2010.
- Use of the Minsmere SIP as leverage to put in place measures to reduce trampling pressure on the dunes and shingle ridge.
- Implementation of SIP actions which benefit little tern by the RSPB through the Little Tern LIFE project, to improve the Natura 2000 network for this species.

Wider Partner Involvement

Work to implement priority actions in partnership with stakeholders is largely happening at the local level. SIPs can play an instrumental role in establishing strong working relationships with partner organisations locally and good examples of this have started to emerge (see Marazion Marsh case study).

Theme Plan working groups have varied in the degree to which they have involved partner organisations, depending on: whether an issue is heavily reliant on delivery by other organisations and driven by existing initiatives and policies, such as coastal management; whether Natural England and partner organisations each have distinct delivery responsibilities, such as management of non-native invasive species; or whether Natural England is working with a group of partners to develop new approaches, such as measures to address atmospheric nitrogen.

7.2 Challenges

The implementation project has successfully fulfilled its original communication plan brief and has managed to disseminate findings and implementation information to partners and the wider public. As with other areas of IPENS implementation, however, competing resource demands have necessarily restricted the ability of Natural England and the implementation steering group to communicate more widely to secure greater engagement from stakeholders.

A high number of partner organisations were closely involved in the original IPENS LIFE+ funded project and have ongoing involvement in IPENS implementation through Theme Plan working groups or locally led site condition delivery work. The degree of organisational level buy-in by partner organisations to IPENS implementation has, however, been more restricted than was hoped, with a small regular membership of the Implementation Steering Group. As a result, the number of partner organisations who have actively promoted IPENS recommendations has been limited.

Partners have encountered some challenges with the practicalities of using IPENS output even where they are fully engaged with implementation. The RSPB, for example, noted that their site ecologists may not have adequately acted on SIP actions at the site level, partly because SIPs sometimes cover multiple, albeit closely related, Natura 2000 sites. They also noted the potential for procedural challenges, including difficulties in influencing their detailed site management planning process. Similarly, the Environment Agency noted that their in-year delivery priorities don't always give enough incentive to implement IPENS findings. A clearer statement of where resources should be targeted may have helped with this.

Opportunities to deliver shared objectives via mainstreaming Natura 2000 priorities into policy areas led by other government departments have not yet been fully explored. These could include public health, transport and infrastructure. This work area warrants greater attention in the future, potentially alongside work to embed Defra's 25 year plan across departments.

7.3 Next steps

Following an evaluation of the EU Nature Directives, the European Commission adopted an 'Action Plan for nature, people and the economy' in April 2017. The purpose of the Action Plan is to improve implementation of the EU Nature Directives and boost their contribution towards reaching the EU's biodiversity targets for 2020. The Action Plan focuses on four priority areas and comprises fifteen actions to be carried out between now and 2019. Ongoing implementation of IPENS may support delivery against the EU Action Plan for Nature priorities by:

- improving knowledge and ensuring better coherence with broader socioeconomic objectives;
- developing and applying smart implementation approaches to support national, regional and local authorities;
- stepping up implementation to strengthen compliance for effective delivery of the Nature Directives;
- strengthening investment in Natura 2000 and coherence with other policies; and
- better communication and outreach, engaging stakeholders and communities.

As a direct result of IPENS, it is anticipated that partner networks established to drive forward elements of IPENS implementation will continue to develop as long as there is a need for them to exist. Natural England's strategic shift towards the development of co-created shared plans for places is expected to encourage locally appropriate engagement with partners and stakeholders and will continue to support productive relationships with a focus on development of shared objectives to be delivered by the partnership's members. This may

mean that those local partnerships which have already been working to deliver IPENS outcomes will be maintained and enhanced.

7.4 Assessment against success criteria

Partner involvement		
Criteria	**Complete?**	**Outcome**
Partners are using SIPs and Theme Plans	**Yes / ongoing**	Examples of the use of SIPs by the Environment Agency and RSPB are quoted in this chapter. Case studies throughout the report highlight partner involvement in SIP and Theme Plan implementation.
Partner organisations are involved in IPENS implementation	**Yes / ongoing**	The **IPENS Steering group** met regularly, attended by 8 partner organisations. Their input to the direction of IPENS implementation contributes to the EU Action Plan for Nature, People and the Economy. **SIPs** are starting to have an instrumental role in developing strong local partner working relationships. Partners are taking responsibility for actions to improve the condition of protected sites. **Theme plans** – As described above under 'Wider Partner Engagement', a wide range of partner organisations have been involved in implementation of theme plan findings.

Case study: Marazion Marsh SPA SIP

Attention was drawn to Marazion Marsh SPA following its mention in a diffuse water pollution Judicial Review brought in 2015 by WWF-UK, Angling Trust and Fish Legal (see Annex 4, Diffuse Water Pollution). The Environment Agency, RSPB, Network Rail, Cornwall Council, Highways England, farmers and local estate owners each had their own focus and priorities for the site, including flood risk management, soil protection, ecological management, coastal erosion pressure, and rail and road management. The Natural England area team water adviser was brought in to ensure that the required work was initiated and met with the stakeholders to discuss their aims. He realised that the SIP provided an excellent overview of the various interests and pressures affecting Marazion Marsh SPA and presented it as a framework to provide direction for the work needed. Stakeholders supported the use of the SIP; its use facilitated creative thinking about solutions and has helped to develop a strong partnership approach. As a result the Environment Agency have funded and overseen the production of a Water Level Management Plan for the site which will benefit the flood defence functions of the marsh as well as the main river for Water Framework Directive purposes (SIP action 1A). The Catchment Sensitive Farming Officer has worked with the Environment Agency Officer to ensure the most effective approach is taken with landowners using combination of regulation and advice, to secure better soil protection (SIP actions 2A & 2D). Silt removal under action 1B was wrapped up into a flood alleviation scheme which was part of the Cornwall Environmental Improvement Strategy jointly paid for by EU Structural Investment Funds. The SIP also provided evidence of the need for investment by Highways England to install silt traps to incept runoff from the road and adjacent ditches (SIP action 2C).

Aerial view of Marazion Marshes SPA. David Wootton (© rspb-images.com)

8. Ongoing implementation

8.1 IPENS Exit Strategy

To ensure that the work started by IPENS continues beyond the closure of the IPENS Implementation Project in April 2018, an exit strategy has been developed, which will help to ensure that ongoing implementation is built into 'business as usual' within Natural England, and into the work that Natural England does with partner organisations.

All IPENS products have been mapped against the Natural England organisational structure to identify ongoing ownership responsibilities as implementation becomes 'business as usual'. Implementation of SIP actions will be the responsibility of Area Teams and Theme Plans will continue to steer the work programmes of specialist staff.

A final round of in-house communication activity will happen in spring 2018 in parallel with the closure of the Implementation Project. This includes news articles for all staff and a series of internal briefings which will ensuring that the managers of relevant Natural England teams are aware of the closure of the IPENS Implementation Project and of their responsibilities for embedding IPENS into ongoing business. Successes of the IPENS project so far will be highlighted which will make staff aware of the ongoing need to implement IPENS findings, for the benefit of Natura 2000 sites, achievement of favourable conservation status, Biodiversity 2020 objectives and resilient landscapes and seas.

8.2 Partner organisations

IPENS publications and the Prioritised Action Framework will remain publicly available via the Natural England publications catalogue and JNCC website. They will therefore be easily accessible to partner organisations to inform their work programmes. As required by the IPENS LIFE+ grant, the IPENS website https://www.gov.uk/government/publications/improvement-programme-for-englands-natura-2000-sites-ipens will also remain available until at least 2021, providing easy access to IPENS documents and a contact point for queries.

Natural England staff in Area and National Teams will continue to use IPENS output to inform their day to day delivery work with partner organisations. Additionally, to make Natura 2000 practitioners in partner organisations aware of the closure of the project and to raise awareness of the benefits of using IPENS products, an article is planned in the summer 2018 edition of the DTA Ecology 'Habitats Regulations Journal' and members of the SSSI Major Landowners Group will be alerted.

8.3 Developing work areas

IPENS findings are expected to have benefits for new and developing work areas. One current example is Natural England's Favourable Conservation Status project. This is producing statements of what 'good' looks like in England for a growing range of habitats and species, accompanied by strategies setting out how to achieve it. As this resource of FCS statements expands, it is likely that IPENS output will be an important information resource supporting development of strategies and delivery of those IPENS outcomes which contribute to FCS of habitats and species.

A second important area where IPENS is expected to make a contribution is to the achievement of the Government's 25 year goals, set out in the 25 year Plan for Improving the Environment. An important element of the final IPENS communication will be to ensure that relevant staff understand the value of IPENS products in this context. The table below indicates which IPENS products are relevant to each 25 year goal.

25 year plan to Improve the Environment – 25 year goals	
25 year goal	**Relevant IPENS products**
Clean air	• Atmospheric Nitrogen Theme Plan • Shared Nitrogen Action Plans (SNAPs) • Site specific actions in SIPs relating to air quality
Clean and plentiful water.	• Diffuse Water Pollution Theme Plan • Hydrological Functioning Theme Plan • River Restoration Theme Plan • Lake Restoration Theme Plan • Site specific actions in SIPs relating to water quality or quantity issues • Relevant IPENS evidence projects
Thriving plants and wildlife.	• Site specific actions in SIPs aiming to improve habitats for plants and wildlife • Relevant IPENS evidence projects • Habitat Fragmentation Theme Plan
A reduced risk of harm from environmental hazards such as flooding and drought.	• Coastal Management Theme Plan • River Restoration Theme Plan
Using resources from nature more sustainably and efficiently.	• IPENS products less likely to be relevant, but there may be useful information in: • Hydrological Functioning Theme Plan • Grazing Theme Plan • Site specific actions in SIPs relating eg to water use, overgrazing, forestry products, deer management
Enhanced beauty, heritage and engagement with the natural environment.	• Public Access and Disturbance Theme Plan • Site specific actions in SIPs related to public engagement or access
Mitigating and adapting to climate change.	• Climate Change Theme Plan • Site specific actions in SIPs to address climate change adaptation or mitigation
Minimising waste.	• IPENS products less likely to be relevant, but there may be useful information in: • Diffuse Water Pollution Theme Plan • IPENS evidence projects relating to diffuse water pollution

Managing exposure to chemicals.	• Atmospheric Nitrogen Theme Plan • Diffuse Water Pollution Theme plan • Site specific actions in SIPs to address pollution
Enhancing biosecurity.	• Invasive Species Theme Plan • Site specific actions in SIPs to address invasive species and disease

8.3 Assessment against success criteria

Exit strategy		
Action	**Complete?**	**Outcome**
Staff and partner organisations have been alerted to the close of the IPENS Implementation Project and their ongoing responsibilities	Yes / ongoing	Communications articles are being prepared for Natural England staff, partner organisations and for the DTA Ecology Habitats Regulations Journal.
IPENS products have been mapped against Natural England's organisational structure to identify ongoing ownership.	Yes	Ongoing responsibility for IPENS products has been delegated to relevant parts of Natural England's organisational structure.
Relevant senior staff in Natural England have approved the exit strategy.	Ongoing	Exit strategy will be signed off at Natural England Director level by end of July 2018.

9. Conclusions

The information presented here clearly illustrates that the use of IPENS output is starting to make a significant impact on the management of Natura 2000 sites and is showing the value of addressing impacts both strategically and at the level of individual sites. We know that where IPENS products are used to best effect, partnership working can be improved, new funding can be secured and new management solutions can be developed. IPENS has been instrumental in helping Natural England and partners to move forward some key issues, such as joint management planning to reduce nitrogen deposition and our understanding of recreation and disturbance impacts in the marine environment. We hope that this will inspire Natural England and partner organisations to increasingly use IPENS information to benefit their work on Natura 2000 sites.

The IPENS Implementation Project itself has been successful in ensuring that implementation is underway across all the headline work areas, including building ecological skills and securing funding as well as improvements to sites or issues. It is clear, however, that there is still much work to be done and that full implementation will take many years. Greater ongoing effort is needed by Natural England and partners to ensure that there is full use of all available tools to improve Natura 2000 sites in England, including management solutions and regulation where necessary.

Our vision for Natura 2000 sites is that they eventually make a full contribution to the favourable conservation status of the interest features they support and that implementation of IPENS recommendations will prove to have been a critical step on the journey to that point. We know that IPENS findings will also be informative for the management of environmental impacts on other types of protected sites and in the wider environment and so aspire to see Natura 2000 sites as an integral part of naturally functioning, resilient landscapes, with the natural capital assets which they host benefitting people for years to come.

Annex 1. Priority actions from IPENS AfterLIFE Implementation Plan

Action no.	Action description	Timescale	Funding option	Lead body	Others involved
Planning and governance					
1	Undertake an exercise to prioritise the actions identified in the IPENS site and theme plans and analyse the synergies. Publish the results as Natura 2000 priorities.	2015 – 2016	Staff resource	Natural England / Environment Agency	AfterLIFE Steering Group, Terrestrial Biodiversity Group, Major Landowners Group, Marine Protected Areas Conservation Advisory Group
2	Develop and agree an Implementation Plan: ▪ Identify existing policies, programmes and other mechanisms which will deliver the priority actions ▪ Work with stakeholders to identify who can lead on the priority actions and who else	2015 - 2016	Staff resource		
3	Embed the agreed priorities within NE and EA organisational delivery plans (local and national). Influencing planning cycles and alignment of resources with others where possible.	2015 – 2016 and onwards	Staff resource	Various	
4	Establish an AfterLIFE Implementation Steering Group to monitor and oversee delivery of the Implementation Plan. Group to meet for at least two years.	2015	Staff resource	Natural England	
Funding					
5	Update the England Prioritised Action Framework to reflect priority funding needs.	2015/ 2016	Staff resource	Natural England	
6	Feed into the Natural England External funding Strategy (Sept 2015) with priorities for funding on Natura 2000 sites and features. Link this to the Prioritised Action Framework.	September-December 2015 for 2016 funding priorities and updating of PAF		Natural England and Defra Terrestrial Biodiversity group	

7	Inform the Terrestrial Biodiversity Group (TBG) 'pipeline' of conservation projects to be submitted to external funding streams (such as LIFE, Heritage Lottery Fund) to ensure Natura 2000 objectives/requirements are considered	2015/2016	Staff resource	Terrestrial Biodiversity Group	AfterLIFE Steering Group
Developing our evidence base					
8	Ensure the IPENS evidence findings inform the Natural England, Environment Agency and Defra evidence programmes	2016		Natural England. Evidence programme	
9	Pilot (as appropriate) the new mechanisms and approaches identified in the IPENS theme plans	2015-2020		Natural England	
Enhancing capability					
10	Undertake a review of the Natura 2000 resource and skills currently available in the environmental sector and develop a plan to address any shortfall			Natural England Protected Sites Programme to lead	
Data management					
11	Ensure successful migration of IPENS database into the Conservation Management System (CMSi).	2016		Natural England, Protected Sites Programme	
12	Ensure that Natura 2000 data in CMSi is kept up-to-date so that it accurately reports against the actions in it and can be used to help monitor implementation	On-going	Staff resource	Natural England Area teams	Relevant local delivery partners
13	On an annual basis re-publish (on Natural England's publications catalogue) any Site Improvement Plans (SIPs) where there has been an update	On-going	Staff resource	Natural England Area Teams, supported by, Protected Sites Programme	
Communications					
14	Develop a communications strategy to ensure: ▪ ongoing awareness raising of Natura 2000 and the work that the AfterLIFE Steering Group and others are doing to implement the priority actions; and that ▪ Natura 2000 evidence and good practice is more widely and easily accessible.		Staff resource	AfterLIFE Steering Group	

Annex 2 Interim success criteria

A series of 'interim success criteria' was developed and agreed with the Implementation Steering Group, against which progress is assessed in this report. The assessment gives a 'snapshot in time' of progress and is to check that the Implementation Project has achieved its aims. The criteria reflect the scope of the AfterLIFE Implementation Plan and were identified using three basic principles:

Criteria should be:

- Simple to understand and easily measurable;
- Not overly onerous to measure, given time and resource pressures;
- Able to adequately demonstrate how much progress has been made.

They comprise descriptive measures together with either a quantitative or qualitative metric.

Interim success measure	Metric
Prioritisation	
IPENS priorities established and available to staff and partner organisations	Complete yes / no
Final copy of revised England PAF approved by Natural England and submitted to Defra.	Complete yes / no
Theme Plans	
Demonstrable progress has been made between 2015-2018 with implementation of some or all of the priority actions for each theme plan.	Number of priority actions that are being progressed (per theme plan). Eg Nitrogen deposition 8/15
For appropriate theme plans, 'on the ground' progress can be demonstrated.	At least 1 case study / pilot site for all theme plans where this is appropriate
Site Improvement Plans	
The original SIP database is available within Natural England and externally via the Designated Sites View system.	Complete yes / no
Good examples of how SIPs are being used and the difference being made.	Case studies for inclusion in final report
A process for uploading SIP actions to the main CMSi system (enabling live updates) has been agreed and tested on a sub-set of priority SIP data.	Agreed process description. Results of test upload. Number of live SIP actions on CMSi.
Funding	
IPENS information has contributed to successfully securing external funding by Natural England and partner organisations.	Number of successful bids / bids in pipeline from Natural England and partners

Benefits of successful bids for Natura 2000 sites can be demonstrated.	List or narrative showing realised or predicted benefits for Natura 2000 sites. Eg by cross reference with Back from the Brink, sand dunes HLF, BogLIFE etc
Evidence	
IPENS evidence is being used.	Number of downloads of IPENS publications, including SIPs and TPs.
New IPENS-related evidence is being generated and shared.	Number of journal articles / reports published / in progress which result from IPENS work
Skills and capability	
Measures are being taken to improve ecological skills and capability within the environmental sector	Demonstrable actions have been taken
Opportunities for increasing public awareness and capacity building have been provided.	Range of opportunities provided
Partner involvement	
Partner organisations are involved in IPENS implementation	Number of partners involved in steering group / Theme plan working groups
Partners are using SIPs	Case studies for final report
Exit strategy	
IPENS products have been mapped against Natural England's organisational structure to identify ongoing ownership.	Detailed exit strategy developed with ownership identified
Relevant senior staff in Natural England have approved the exit strategy	Approval of exit strategy given by Strategy Implementation, Operations and Evidence teams
Staff and partner organisations have been alerted to the close of the IPENS Implementation Project and their ongoing responsibilities	Final communications work implemented

Annex 3 Natura 2000 priorities

This Annex gives an overview of the Natura 2000 priorities, derived from IPENS findings, which were included in the 2016 England Prioritised Action Framework.

1. Actions identified in the SIPs and theme plans form the programme of site and theme based priorities for Natura 2000.

2. Ongoing management and programmed measures need to contribute as these have generally not been included in the SIPs and theme plans.

3. Strategic conservation priorities for Natura 2000 in England, for the period 2014 – 2020 are:

    a. Halting and reversing declines of designated interest features within the Natura 2000 network;

    b. Synergies: Implementation of Natura 2000 measures that also contribute to other objectives and priorities, in particular Water Framework Directive (WFD), Marine Strategy Framework Directive (MSFD) and the England and European Biodiversity targets for 2020;

    c. Natura 2000 'Core Priorities': Improving the condition of European interest features for which England's Natura 2000 sites make a particularly significant contribution to achieving a more favourable conservation status. This is also a longer term priority, associated with the delivery of Defra's 25 year plan.

4. 18 Natura 2000 'Core Priorities' (listed below) have been identified, linking features and sites into ecosystem groups and mapping out the synergies with other objectives:

E1.A Coastal: Sand dunes	E4.C. Lowland Heath
E1.B Shingle and cliff habitats	E4.D. Lowland Bog
E1.C Coastal grazing marsh	E4.E. Lowland Fen
E2.A Intertidal	E5.A. Grassland
E2.B Subtidal / inshore marine	E5.B. Mined / disturbed
E3.A. Standing waters	E5.C. Cultivated grass
E3.B. Rivers	E5.D Floodplain grassland
E4.A. Upland heath and bog	E6.A. Woodland
E4.B. Upland fen	E7.A. Rocky habitats

Examples of features for which England's Natura 2000 network can make a particularly significant contribution to achieving favourable conservation status at EU (biogeographic) level:

EU code / Lay title or English name	UK % of Atlantic region	UK influence on Atlantic status and qualifier	EU status	UK status	Estimated proportion of UK in England SACs
S1654 Early Gentian	100%	Direct influence	U2=	U2=	>75%
H6520 Mountain hay meadows	100%	Direct influence	U2-	U2-	>40%
*H91J0 Yew-dominated woodland	94%	Direct influence	U2=	U2=	>40%
H1130 Estuaries	42%	Important contribution	U2-	U2-	>40%
H1330 Atlantic salt meadows	41%	Important contribution	U2=	U2=	>40%
H7140 Very wet mires often identified by an unstable 'quaking' surface	37%	Important contribution	U2-	U2-	>40%
H1310 Glasswort and other annuals colonising mud and sand	36%	Important contribution	U2-	U2=	>40%
(*)H6210 Dry grasslands and scrublands on chalk or limestone	36%	Important contribution	U2-	U2=	>40%

EU code / Lay title or English name	Breeding (B) / non breeding (NB)	Bird of conservation concern (BoCC4)	International importance (WI/BI in BoCC4)	% population in UK SPAs	Trend in England SPAs
A037 Bewick swan	NB	Y	Y	~70%	Declining
A048 Common shelduck	NB	Y	Y	~70%	Declining
A054 Northern pintail	NB	Y	Y	~60%	Declining
A157 Bar-tailed godwit	NB	Y	Y	~85%	Declining
A162 Common redshank	NB	Y	Y	~40%	Declining

*Habitats Directive priority habitat
(*) H6210 important orchid sites are a Habitats Directive priority habitat
U2= Unfavourable – Bad conservation status, stable trend
U2- Unfavourable – Bad conservation status, declining

Annex 4 Theme Plan progress

Return to Chapter 4: Making a difference to Issues

Atmospheric Nitrogen

Significant progress has been made with the development and communication of Shared Nitrogen Action Plans (SNAPs) as recommended by the Nitrogen Deposition Theme Plan. Six pilot SNAPs are underway (Epping Forest, Birklands and Bilhaugh, Fenn's and Whixall, Breckland, Culm Grasslands and Tintagel-Marshland-Clovelly Coast) and two more are being scoped. The SNAPs evidence gathering, stakeholder engagement planning and collation of measures are underway during 2017-18 with contributors from across Natural England work areas. The final SNAPs will then be co-developed and agreed in 2018-19 with external partner organisations, including the Environment Agency, Natural Resources Wales, Wildlife Trusts, RSPB, local authorities, National Farmers Union and consultants. 2018-19 will see scoping of landscape scale SNAPs including one for ammonia in West Midlands and the DuneLIfe project where SNAPs will be undertaken for 2 of dune sites in the project and include restoration measures planned as part of HLF funded work.

Where opportunities arise, SNAPs are being integrated with other local projects, such as the Culm Grasslands Pioneer Project for the 25 year plan and the Marches Mosses LIFE project (the funding bid for which was supported by the Theme Plan). Individual SNAP project groups have been established, and the pilots are currently overseen by Natural England with information shared with Defra, the Environment Agency and other stakeholders as needed. Guidance, templates and source attribution data have been produced for each pilot and training is being delivered in Natural England.

In parallel to the SNAPs, Natural England is collaborating with other Statutory Nature Conservation Bodies and academic institutions to develop and promote research which will underpin decisions on the ground. This includes the development of a nitrogen decision framework for attributing nitrogen deposition as a threat to, or cause of, unfavourable habitat condition on protected sites. It is published on the JNCC website at: http://jncc.defra.gov.uk/pdf/Report_579_final_web.pdf.

Climate Change

Delivery of Theme Plan findings was the justification for securing funding to support a student (Elise Quinn) who worked with Natural England in the summer of 2016 to apply the recommended site based assessment to the top third most vulnerable SACs. This work will be a major component of a Natural England Research Report due to be published in 2018.

Further development of the climate change vulnerability screening method since publication of the theme plan has produced an alternative screening methodology suitable for SPA bird species (rather than the habitat based National Biodiversity Climate Change Vulnerability Assessment method previously used). This has enabled a full screening assessment to be made for all SPAs and SACs. Data layers resulting from the screening assessment have been made available to Natural England staff via an in-house mapping system, WebMap2 and interpretation advice has been embedded into Countryside Stewardship guidance. The underpinning methodology has been submitted to a peer reviewed journal.

Wider benefits are being gained from the delivery of the Theme Plan in terms of how Natural England's thinking has developed about the assessment of vulnerability of protected areas. This has helped inform recent discussion papers on Climate Change and Favourable Condition and Favourable Conservation Status.

Coastal Management

The Coastal Management Theme Plan consolidated a range of ongoing work with recommendations being were targeted at improving the delivery of existing efforts. There is ongoing progress across many of the recommendations, including the identification of potential habitat creation locations, linked to individual schemes. Understanding of estuary morphology and process are being used to highlight areas where estuary form needs adapting to move closer to equilibrium. Projects to date have been case studies to test methods and will help to determine how close an estuary is to favourable condition. Experience of applying 'no active intervention' policies has been gained at several locations in the wake of the 2013 storm surge and was presented at a conference in Suffolk in 2015 http://www.suffolkcoastandheaths.org/estuaries/saltmarsh-conference-2015/

Following publication of the Theme Plan, Natural England has worked with the Environment Agency on the 'Working with Natural Processes' (WWNP) project and has produced a coastal case study for North Norfolk which builds on the Theme Plan Cley-Salthouse study. It shows how management at a number of locations in the last 13 years has moved more towards these principles and helps to illustrate the long delivery timescales and capability needed for adaptive approaches. Published documents are available here: https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-flood-risk-a-research-and-development-framework and other work was due to be launched late in 2017.

Diffuse Water Pollution

Implementation of this Theme Plan has greatly benefitted from a legally binding Consent Order (CO) agreed as a result of a Judicial Review (JR) brought in 2015 by WWF-UK, Angling Trust and Fish Legal. The CO requires that for each Natura 2000 site failing its water quality conservation objectives (and therefore its WFD protected area targets), Defra and the Environment Agency must:

1. Determine the causes of pollution, putting in place additional monitoring or modelling if there are data gaps.
2. Evaluate whether the existing measures and mechanisms to tackle pollution will be sufficient for the site to meet protected area status.
3. If not, assess the measures and mechanisms that would be most effective to achieve these objectives and where the measures should be deployed.
4. Update the Diffuse Water Pollution Plans (DWPPs) for each site to include the above assessment and take forward the recommended measures and mechanisms.

Staged work to fulfil the CO is progressing on the 36 Natura 2000 sites which have DWP Plans. The CO objectives are well aligned to many of the Theme Plan priority actions and have ensured that priority actions are developed at a greater pace.

In parallel with JR related work, Natural England commissioned and undertook 5 phases of research on the impact of Small Sewage Discharges (SSDs), developing a risk assessment methodology for Natura 2000 and SSSI sites (published as NECR222, here). Catchment specific projects that look to apportion nutrient impacts from highways, industry and urban runoff have also been commissioned.

Grazing

Recent changes in the political and organisational context are particularly significant for implementation of the Grazing Theme Plan. The EU exit vote has changed Natural England's organisational focus and provides new opportunities for IPENS to inform future agri-environment delivery mechanisms and measures through EU exit readiness work. Coupled with this, the Natural England Conservation Strategy is changing ways of working, so there is less focus on individual sites and a greater consideration of the landscape context, thereby offering the scope for integrated projects.

The Grazing Theme Plan has steered the development of an overview of grazing issues and blockages affecting Natura 2000 sites, through collation of individual SIP actions. Common themes and possible mechanisms have been collated and will be used to inform Natural England's input to the development of future delivery mechanisms.

On the ground, implementation of Countryside Stewardship is currently limiting the flexibility needed to adapt grazing management to achieve protected site goals. Work is ongoing with Natural England accreditation and the Rural Payments Agency to ensure stocking calendars can allow for flexibility whilst meeting inspection requirements.

Case study examples of successful grazing projects are being collated via Natural England networks, for future development and dissemination. Staff capability is also being enhanced through conservation grazing training courses, offered by the Natural England Field Unit and the Rare Breed Survival Trust.

Habitat Fragmentation

Work to implement Theme Plan recommendations is happening as an integral part of Natural England's work on habitat networks and connectivity. There are two parts to this: updating knowledge, and applying best available information to conservation delivery. Data, evidence and published papers relating to wildlife networks have been reviewed and added to, including data on potential locations for habitat creation and areas where species or communities of species continue to survive (refugia), which effectively updates the evidence that supported the Lawton report[11]. This evidence is being applied through new mapping approaches being led by Natural England's Resilient Landscapes and Seas team. Secondly, adoption of habitat network evidence is being facilitated by the development of guidance which enables habitat fragmentation to be considered as part of general conservation delivery. The guidance is known as the Ecological Networks Handbook. It is currently

[11] LAWTON, J.H., BROTHERTON, P.N.M., BROWN, V.K., ELPHICK, C., FITTER, A.H., FORSHAW, J., HADDOW, R.W., HILBORNE, S., LEAFE, R.N., MACE, G.M., SOUTHGATE, M.P., SUTHERLAND, W.J., TEW, T.E., VARLEY, J., & WYNNE, G.R. (2010) Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra.

available to Natural England staff and will be published once testing in pilot areas has concluded.

Natural England has continued to work with partner organisations to secure funding to develop and implement connectivity projects, as opportunity arise. This usually depends on the presence of strong partnerships for work to happen, with the current lowland raised mire 'bog LIFE' projects being good examples.

The Habitat Fragmentation Theme Plan has given Natural England focus and direction around this topic and has helped Natural England to engage with this issue as an organisation. Benefits gained so far are often difficult to attribute to IPENS alone, and it is hard to say how much the theme plan has been a catalyst for new work outside of Natural England, as important drivers such as the Lawton report[10], Biodiversity 2020[7] and the Natural Environment White Paper[12] have also driven work forward over the same timescales.

Hydrological Functioning

Hydrological restoration of bog, mire and heath systems has continued since publication of the Hydrological Functioning Theme Plan, with significant successes in securing new funding. The Water Environment Improvement Fund (WEIF) (for Water Framework Directive purposes) is enabling on the ground delivery, restoration plans or evidence projects at about 28 sites. In addition three new LIFE+ programmes are in place for key raised bog sites (Humberhead Levels; Solway Mosses, Bolton Fell Moss and Roudsea; Fenn's and Whixall). IPENS information helped to secure some of these successful project bids.

Discussions have started with partner organisations via the Terrestrial Biodiversity Group (TBG) about the value of developing a programmed approach to the hydrological restoration of SAC terrestrial wetlands. Some initial work to identify priority sites has been done and will be developed alongside prioritisation work for WEIF funding.

Initial steps to review the status of Water Level Management Plans (WLMPs) and where action may be necessary have been taken, in response to the priority action to implement actions in existing agreed WLMPs.

Invasive Species

IPENS SIP data and the Invasive Species Theme Plan contributed to a successful bid for LIFE funding for the RAPID project – Reducing And Preventing Invasive Alien Species Dispersal. The project will run from July 2017 for 3 years and is being led by the Animal and Plant Health Agency (APHA). It will deliver a package of measures to reduce the impact and spread of invasive alien species in freshwater aquatic, riparian and coastal environments. Specifically the project will establish a regionally-based framework to deliver more effective IAS management across England and increase biosecurity awareness amongst target audiences through a coordinated programme of engagement at England-wide and regional levels.

[12] DEFRA (2011) The natural choice: Securing the value of nature. (Natural Environment White Paper), HM Government.

Detailed analysis of SIP data has been used to inform the list of species for which Natural England is providing policy advice. A series of internal "position statements" on key species such as *Crassula helmsii*, wakame and Rhododendron has been produced, followed up with launch webinars to engage with Area Teams.

A key recommendation of the Theme Plan was to explore options for providing advice to inform local work programmes and assist coordination of partnership work and funding. Through Natural England's Conservation Strategy change programme, thinking will be developed around how to integrate control of invasive species as part of landscape scale delivery in Focus Areas. Testing of tools and development of integrated plans will begin in five Focus Areas which are Landscape Scale Delivery Change Plan pilots (see section 6.3 for further information) and most of which include Natura 2000 sites.

Lake Restoration

Priority theme plan actions focussed on establishing a programmed approach to lake restoration and funding, securing the project officer post and improving communications. Good progress is being made across all of these objectives. Continuation of funding for a joint Natural England and Environment Agency lake restoration project officer post was secured for 2015-18 and potentially into 2019. The post coordinates lake restoration delivery work on protected sites, thereby contributing to improving site condition, Water Framework Directive delivery and Theme Plan recommendations. The work is supported by the publication in 2016 of a Natural England 'freshwater narrative' (NERR064), which sets out the rationale for naturally functioning lake habitat.

18 lake restoration plans have been produced or refined which provide site-specific reviews of evidence and issues, together with recommendations for future management and restoration interventions. Delivery of lake restoration projects is being incorporated into the new RDPE funded Water Environment Grant scheme allowing greater partnership delivery of restoration projects.

Communications between lake restoration practitioners are being improved with the inclusion of 4 area based Natural England staff in the Lake restoration steering group to give practical input to the strategic planning process and to disseminate national information back to area teams. A joint NE/EA lake network meeting is planned in 2018 with a lake restoration theme. Efforts will be made to increase dialogue between managers of similar sites. Lessons are also being learned from significant lake restoration projects, such as the Hoveton Wetland Restoration HLF / LIFE funded project, which includes comprehensive monitoring.

Specific studies, including a fish survey methodology for lakes have been completed (see case study in chapter 4) and will be used to guide future management at individual sites.

Public Access and Disturbance

A Theme Plan workshop was held in October 2017 to support implementation of Theme Plan recommendations and to review existing evidence on possible impacts and the effectiveness of existing mechanisms to address disturbance from five priority issues: dog walking, walking, coastal and wetland sports, wildfowling and low-flying aircraft. It was concluded that evidence of impact is available but requires collation. The effectiveness of measures to address impacts is less well understood and the potential for a project to objectively examine

this was discussed. A further meeting in April 2018 aims to develop a clear project plan by examining what access management measures work well and why, and will combine environmental expertise with behavioural insights from social scientists.

Work has progressed further in the marine environment where the SIP database was analysed to identify the frequency of activities being reported as threats and additional feedback was sought from Marine Protected Area (MPA) officers on the risk and issues relating to different activities.

The resulting information was used as the basis for developing an evidence project with the Marine Management Organisation (MMO) which was contracted to ABPmer. This produced a series of information notes about the evidence and risk of impacts from 13 marine activities, developed a management toolkit of different options and reviewed effectiveness of a series of case studies and also worked with national membership organisations to identify gaps and recommendations for good practice messaging. The results are published at the following link and will be updated through yearly workshops and feedback from local MPA officers: http://publications.naturalengland.org.uk/publication/5164654430519296.

River Restoration

The River Restoration Theme Plan collated a wide range of existing work and sought to make strategic recommendations to ensure that the work programme progresses effectively. Many of the recommendations are already underway and there is good collaboration with partner organisations.

Natural England has completed a strategic review of the river SSSI series in England which is currently awaiting approval before publication. It will help to better underpin the restoration of natural riverine processes for both habitat and species conservation, including on Natura 2000 sites. A strategic analysis of the current use of available delivery mechanisms eg LIFE and HLF has also been completed. It has enabled the development of a new joint funding stream for SAC rivers with the Environment Agency which is due for launch in December 2017. New options to benefit rivers have also been embedded and are active in the Countryside Stewardship RDPE scheme.

New approaches for funding river restoration are being investigated. Opportunities with food producers who are seeking enhanced brand reputation have started to be explored on a small scale, with a view to them helping to deliver biodiversity benefits to protected rivers. This is to be progressed further in 2018. Four developer contribution schemes to benefit river restoration have now been delivered and a further five are in development. An example on the River Mease SAC has been used in guidance on new approaches.

Ongoing work with partners, including the International Union for Conservation of Nature (IUCN) has continued to develop the evidence base on the importance of natural processes to riverine ecosystems and the benefits of physical restoration. Evidence gaps are being filled and monitoring strategies are being developed. Monitoring guidance has been published together with a help-note for Area Teams.

Annex 5 Feedback from IPENS funded evidence projects

Project reference / title	Feedback and benefits gained
IPENS 001 plans – Setting the standard for Natura 2000: Diffuse Water Pollution	This project provided exemplar plans for tackling Diffuse Water Pollution pressures at two SACs. These plans continue to provide the basis for local action on DWP for those sites but importantly have also provided a valuable point of reference for other area teams and stakeholders engaged in preparing similar plans at other N2K locations. The exemplar plans lead by example by demonstrating clearly the content and format that should characterise a detailed and well evidenced plan.
IPENS 002 Healthy Estuaries 2020	This project is linked to delivery of advice to address coastal squeeze, so covers national and international protected sites. The project was jointly managed with the Environment Agency which provided data for the case study sites, thus improving early understanding by both organisations. Since publication a joint dissemination meeting was held and 2 further examples of locations will be covered using the methodology developed, for which NE evidence funding has been secured. Through this we will be able to develop a better understanding of application in practice and linking the results of estuarine morphological analysis with habitat condition assessments. There are links to the WFD morphological assessments. Key benefits are using a consistent approach based on measurable parameters of an estuary system (subject to available data) which reduces risk of challenge and aims to identify the most practical locations for addressing problems. A range of external parties have been made aware of the work, from consultants to students, as well as the Natural England Major Landowners Group (MLG).
IPENS 004 River Avon and valley macrophyte survey	This survey covered the flora within the River Avon SAC and assessed the changes that have happened since the in-river vegetation (termed “weed”) cutting ceased in 2010. The results of the survey have helped to inform us that there have been no negative changes to the in river flora due to the cessation of weed cutting. The survey also set a repeatable methodology so that further change can be assessed in future years.
IPENS 005 Dubbs Beck study (not published)	The IPENS funding enabled us to assess the sedimentation, water quality and flows in Dubbs Beck to ascertain whether conditions are correct to reintroduce freshwater pearl mussels from their ARC base.
IPENS 008 DWP – Meeting local evidence needs to enable Diffuse Water Pollution Plan delivery	This project generated key new datasets to inform water quality improvement planning across Natura 2000 catchments namely: outputs from application of a cross sectoral source apportionment modelling framework and sediment risk mapping using SCIMAP model. The project also explored application of a new method to assess the ‘gap’ between contemporary sediment pressure and estimates of background sediment delivery to freshwater. In addition, pollution risk assessment and sources apportionment reports were produced for two Natura 2000 catchments to demonstrate how different evidence sources can be integrated at the catchment scale to inform decision making for improving water quality. The new evidence generated through this project and the production of the pilot risk appraisal reports provided the foundation for a systematic rollout of catchment based pollution risk appraisal across a much larger number of Natura 2000 sites which continues to inform water quality improvement planning.

IPENS 009 Humber Estuary clay pits water quality briefing (2013 – 2014)	The project focussed on former clay pits in the Far Ings NNR on the south bank of the Humber Estuary SSSI/SPA/Ramsar site which are in unfavourable condition due to a decline in aquatic macrophytes, and were known to have very high annual average phosphorus (P), failing the SSSI water quality target. During the project the south bank of the Humber Estuary was inundated by the tidal surge of December 2013. The project scope was widened to include not just an investigation of the sources of P, but also an assessment of the impacts of the surge on P, nitrogen and salinity. The main conclusions were: i) the tidal surge resulted in immediate elevation of salinity. This declined rapidly but is still elevated to brackish levels and is now the key driver affecting favourable condition. ii) The surge temporarily raised the nitrogen levels but did not affect P levels. iii) Sediment analysis found that the main source of P was chemical and physical remobilisation of lake bed sediments, in which P was thought to have accumulated over time from bird guano (especially Canada geese, greylag geese and coot). Various solutions to deal with elevated salinity and P were recommended but none has been practical to implement. Overall, the project has considerably improved Natural England's understanding of the reasons for unfavourable condition of the clay pits and provided valuable baseline information for monitoring the impact of the tidal surge. The practical actions that can be taken are limited, and follow up work is focussing on monitoring of salinity and recovery of the lakes to freshwater.
IPENS 010 & 037 Tees Estuary intertidal project (not published)	This project collected data on algal mats, benthic infauna and sediment particle size in three locations within the Teesmouth & Cleveland Coast SPA, and explored the relationship between these. The dataset also allowed NE to assess whether initiatives to improve water quality in the Tees had resulted in a reduction of the extent of the algal mats in a key waterbird foraging area, Seal Sands SSSI. NE has shared the reports and datasets with our partners on the Tees Estuary to inform future conservation activities and assessments in these areas.
IPENS 012 Alde-Ore Estuary Complex: National Vegetation Classification 2013	This site had not previously had a full NVC survey and so the project has established an almost complete NVC survey of site and provides an important baseline and filled habitat data voids. This will allow for more accurate condition monitoring of the site, required for both SSSI, SPA and SAC condition assessment and contribution to the marine evidence programme which provides information for the MCZ designation packages and EIFCA to inform their management work under Article 6.3. The survey provides a qualitative measure of intertidal habitat (saltmarsh) and help address concerns regarding coastal squeeze. It also accurately informs the presence and extent of SAC/SSSI features and allows better tailoring of Conservation Objectives and Favourable Condition Tables. This work allowed comparison of 1993 NVC survey results, to assess change in saltmarsh character/distribution. It has underpinned MSC work on saltmarsh Carbon Storage of the Butley Estuary. The work has been shared internally and externally with partners (RSPB, SWT, NT, Estuary Partnership, etc.).
IPENS 013 Minsmere-Walberswick mapping project 1 (not published)	This area of the site had not been NVC surveyed for 20 years and so the project has contributed to an up to date NVC survey of site and has filled habitat data voids. This will allow for more accurate condition monitoring of the site, required for both SSSI, SPA and SAC condition assessment. The survey provides a qualitative measure of intertidal habitat (saltmarsh) and helps address concerns regarding coastal squeeze. It also accurately informs us presence and extent of SAC/SSSI features and allows better tailoring of Conservation Objectives and FCT. The work has been shared internally and externally with partners.

IPENS 014 River Wye crayfish survey (not published)	The River Wye and the River Lugg are designated as SSSI and SAC. One of the notified features for both is the Native White Clawed Crayfish. There was very little data about locations of the crayfish and the strength of the populations within the catchment. Money was sought by NE to be able to survey the designated rivers to at least know what species of crayfish were present and where there are gaps. We only had enough money for a short one season survey so we focused the effort on the main channels and hope to look at the wider catchment in future years. The study revealed areas with no crayfish, areas of native crayfish, areas of American Signal crayfish and areas of mixed populations. Using this data we have been able to target restoration measures to the River Lugg and we have promoted wider biosecurity in the catchment. We have subsequently been able to secure money to breed native crayfish and release them in more secure areas of the wider catchment. The report has also enabled other NGOs in the catchment to set up projects to protect native populations and to start work on controlling Signal crayfish abundance and spread.
IPENS 016 Dark Peak mapping project (not published)	The tool developed by the project allows us to link Favourable Condition Table and habitat data to a geographic reference in Arc GIS so that we can quickly draw together relevant information for analysis of unit management for feature interest. We can also add new datasets and update information. We are using it in updating FCTs and we expect to use it for the development of Long Term Management Plans.
IPENS 017 and IPENS 052 Bowland Fells Lesser Black Backed Gull surveys 2013 and 2014 (not published)	Lesser Black Backed Gull surveys have been done in the Bowland Fells SPA in 2013, 2014, 2015, 2016 and 2017, with IPENS funding the first two. This information is being used to: Establish the extent and population of LBBG within the Bowland Fells SSSI/pSPA in both the Tarnbrook Fell and Langden Head colonies. This is helping to monitor the condition of the feature within the site, inform management decisions which will ensure that it is maintained in favourable condition alongside other site features and to feed into wider surveys which will help assess regional and national populations and inform land use and management strategies to ensure the long term conservation of LBBG.
IPENS 022 Ribble & Alt estuary intertidal sediment condition monitoring	The study has provided vital information to assess change in key littoral sediment attributes over a 6-year time period (2007 and 2013) and has enabled a preliminary assessment of the condition of these attributes. This information will be used in combination with information from additional sources to undertake an assessment of the overall SSSI unit condition for the 4 intertidal units and will be used to inform the updated Favourable Condition Table for the site. The data collected as part of the study has also informed our revised conservation advice package for the Ribble & Alt Estuaries SPA.
IPENS 025 Predicting the mussel food requirements of oystercatchers in the Exe Estuary	The project was commissioned to identify the potential impacts of ‘an enhanced catch and grow fishery’ on the Exe Estuary N2K site, in particular how the oystercatcher population responds to environmental changes as a result of this activity. The approach used computer simulations based on a behaviour-based model to enable predictions on positive or negative fishery impacts and enable the delivery of advice on the management of the principal mussel beds within the estuary in respect of the oystercatcher population and other bird species.
IPENS 030 Berwickshire and North Northumberland Coast – impact of potting on benthic habitats (not published)	Defra’s Fishing in Marine Protected Areas project, which considers the potential impacts of fishing activities (through Habitat Regulations Assessments) on the designated features of each marine site, resulted in the need for robust evidence of fisheries impacts (or lack thereof) on designated features. Various fishing activities will only be allowed if they do not adversely affect site integrity. The effects of parlour pot fishing on subtidal rocky reef was an identified knowledge gap. This research and resultant, related research added to the evidence base by investigating the long-term impacts of parlour potting on epibenthos and habitats within the Berwickshire & North Northumberland Coast, a Special Area of Conservation, under the EU Habitats Directive.

IPENS 031 Berwickshire and North Northumberland Coast – intertidal rocky reefs	Rocky reefs (littoral and sublittoral) are one of several interest features of the Berwickshire and North Northumberland Coast SAC / EMS. Surveys funded by IPENs were carried out between 16th and 27th August 2013 on the intertidal rocky reef. There were no significant differences between the first condition monitoring work carried out in 2002 and the current survey in 2013, or from the baseline of biotope distribution for the area carried out in 1999. The work carried out improved the knowledge-base of the site. The survey was designed to provide a robust statistical collation of data on the community composition of the intertidal rocky reefs and under boulder communities, which has allow the data to be used in power analyses to inform on condition assessments on other sites. The value in this data rich approach will be apparent when future condition monitoring of the site is carried out.
IPENS 034 River Mease phosphate bioavailability (not published)	This project has provided valuable evidence on how the river system works and quantifies the impact of bioavailable phosphate. This increased understanding has enabled us to tailor our advice when considering project and plans within the catchment.
IPENS 035 Distribution of selected non-native species within the intertidal zone of the North East Kent Marine Protected Areas	This project has been particularly beneficial in providing the evidence to underpin management of the invasive pacific oyster within the North East Kent Marine Protected Areas. The evidence has enabled the management to be targeted in delivery and based around risk, which is critical when trying to manage marine invasive species on such a large scale.
IPENS 039 Westleton Heath National Nature Reserve: National Vegetation Classification 2013 (Minsmere-Walberswick mapping project 2)	This area of the site had not been NVC surveyed previously so provides a valuable benchmark and has contributed to an up to date NVC survey of wider site and has filled habitat data voids. This will allow for more accurate condition monitoring of the site, required for both SSSI, SPA and SAC condition assessment. It accurately informs us presence and extent of SAC/SSSI features and allows better tailoring of Conservation Objectives and Favourable Condition Tables. The work has been shared internally and externally with partners.
IPENS 041 *Spartina anglica* and its management in estuarine Natura 2000 sites: an update of its status and monitoring future change in England	This work on *Spartina anglica* aimed to lead to consistency of monitoring future change in extent of saltmarsh communities dominated by this species. There is limited quantitative information on changes in coverage of this species, and this review provides a useful summary of recent research to complement previous reviews and prompting a re-think of the overall issue. Change in coverage of *Spartina anglica* has not been effectively measured recently, with assumptions and anecdote being the main drivers: this synthesis and recommendation to gather evidence before determining management actions will mean that action is driven by better data and may lead to more effective and better-costed approaches through better understanding of the biological and physical aspects of expansion and die-back. Since publication it has been widely promoted to Natural England staff and EA and other organisations with an interest in this species. It complements previous work on the extent of *Spartina maritima* (H1320) for which there are only a few locations in England, but which could be susceptible to impacts of management of *Spartina anglica* if inappropriately designed.

IPENS 044a & 44b Eco-hydrology projects – Norfolk Valley Fens Part 1 & 2 (not published)	This project reviewed all existing data from, and studies of, the 14 component sites within the Norfolk Valley Fens SAC to identify pressures, evidence gaps and catalogue actions necessary for restoration/achievement of favourable status. An additional piece of work considered opportunities for landscape restoration in the core areas for the SAC habitats, based on historical records, old maps (Faden's 1790s maps of Norfolk) and the known environmental requirements of the habitats. These reports are being used by the local team to prioritise work on the sites, e.g. hydrological restoration at Coston Fen, and landscape scale restoration planning, although less progress on this latter activity.
IPENS 046 Understanding impacts of invasive non-native species on protected sites	From a marine perspective: · The project produced a spreadsheet of INNS records per SAC and SPA which has been used as a starting point to inform our new condition assessments for marine sites, help provide advice to contractors doing surveys on the likely species to look out for and provide advice on casework in terms of likely risks. The spreadsheet was made available directly on our marine toolkit. · There were some really useful recommendations on improvements to data flow and internal information which have now been progressed via the Marine Evidence Project. So all our data on marine INNS that are gathered both internally and through contracts are uploaded to marine recorder which then goes to the National Biodiversity Network gateway.
IPENS 047 Humber Estuary SPA – investigating changes to bird populations (not published)	IPENS funded a desk based information review to identify drivers of bird population change, a recommendation of which was to undertake a bird tracking study to investigate how birds are using estuary habitats. A bird tagging study was subsequently funded by Natural England's Innovation and Partnership fund and proved to be a real success. The study was supported by a partnership including RSPB, the Yorkshire and Lincolnshire Wildlife Trusts, BTO, Humber Nature Partnership, Hull University and the Humber wader ringing group. The BTO were especially pleased with the way the tags operated, exceeding expectations in terms of longevity and quantity of data downloaded to the base stations. The 'proof of concept' aspect of the project was realised and we also got some excellent data, albeit a small sample size, indicating how waders are using managed realignments sites and functionally linked land in the Humber. The partnership nature of the work has led to improved relationships with groups in the estuary. Although the cost of equipment has prohibited a wider continuation of the study in the short term, work is underway to use the project outputs to support funding bids to both industry and academia.
IPENS 049 Site categorisation for Nitrogen measures	This evidence project was instrumental in mapping out which SACs would benefit most from local ammonia measures. This is now available as a spatial layer on Webmap and MagicMap for professionals to use. The information is used in Natural England's work on focus areas, pilot Shared Nitrogen Action Plans (SNAPs), development planning and encouraging the uptake of relevant option under Countryside Stewardship.
IPENS 050 Case studies for delivering ammonia measures	This project provided evidence of how the Catchment Sensitive Farming (CSF) approach could be used to put in place ammonia measures. This evidence has been applied in training of staff and the development of a programme to combine CSF advice to farmers on water and ammonia.
IPENS 053 River Mease impact of road network (not published)	The outputs/evidence from this project identified that drainage from the roads in the catchment was impacting on the integrity of the River Mease SAC. The evidence has enabled Highways England to gain funding for works to start the process of improving the drainage from their road network and has enabled Natural England to fund a SUDS retrofitting feasibility report focussing on Ashby-de-la-Zouch. (see case study in section 5.1)

IPENS 054 Allis Shad Fish Passage Options Appraisal – Gunnislake Weir	The feasibility study into improvements to Gunnislake weir to allow the passage of allis shad has been extremely useful, as a result of the options identified Natural England and a number of partners have started discussions about implementing the recommendations and aim to secure external funding to support the cost of the work required.
IPENS 058 White-clawed Crayfish (*Austropotamobius pallipes*) Survey of the River Dove between Hollinsclough and Beresford Dale, Peak District National Park	This work confirmed that native crayfish are indeed present in the waters of the upper Dove, following anecdotal reports of a single female being found, and that the habitat throughout the Dove, including the SSSI and SAC stretches, provides for the most part excellent crayfish habitat. There is therefore now the real possibility that native crayfish will be able to naturally recolonize the river where plague wiped the species out in 2005, and we can therefore be confident that works to restore the natural channel dynamics through the River Dove Restoration Strategy will be actively supporting the potential reestablishment of this species to its former range.
IPENS 060 Design of a vegetation monitoring scheme for the Border Mires	Excellent long term monitoring tool that can pick up changes in vegetation using a Bog Quality Index. This is far more resource heavy than CSM however (more akin to LTMN style monitoring but without the disadvantages of permanent quadrats). The Index and methodology have been used recently by research students from Newcastle University in the Border Mires and whenever funds are available it is hoped that at least some of the mires can be monitored at this level, even if this is every 20 years or so, to pick up subtle change.
IPENS 061 *Vertigo moulinsiana* surveys	This project gathered together previous data and looked for threats, trends and locations of Desmoulin's whorl snail. It clearly demonstrated the continuing catastrophic decline on the River Avon SAC where it has gone from common to only have 3 small sites, despite the vegetation and river 'looking fine'. At Westbere, we detected a continuing trend of population thinning, and some localised losses, as well as recoveries, in addition to tracking populations in the Broads. We are in the early stages of putting together a paper on the declines on the Avon SAC and the IPENS data will be a core underpinning of that. Part of the commission was to work with the Natural England Area Team for the Avon, and as a result they have new ideas of how we might try a modest recovery for this species.
IPENS 066 Analysing change in moorland management in the North York Moors Special Protection Area	The study used aerial survey imagery and data on the location of breeding merlin to reveal a change in the pattern of moor burning in the North York Moors between the mid-1990s and 2008. This work also suggested a correlation between burn distribution and occupancy by breeding merlin. The project has helped to raise awareness of the possible effects of changes in moorland burning management on moorland breeding birds, especially those dependent on mature heather for nesting. There is a possibility of further work elsewhere in the English uplands which could help to reinforce these findings and thus promote further detailed research into the issue.
IPENS 067 Surface water catchment mapping for Natura 2000 Diffuse Water Pollution Plans	Catchment boundary maps are now available for Natural England staff to use within their Diffuse Water Pollution plans for Natura 2000 sites and underpin the work needed to take forward the DWP judicial review consent order. They have also been used for subsequent projects, such as the water quality catchment assessment projects which have collated evidence on diffuse water pollution for a number Natura 2000 catchments to help identify where to target actions to achieve favourable condition. They will continue to be used to inform development of any new agriculture scheme for reducing water quality issues for Natura 2000 sites.

IPENS 070 Border Mires 3 – mapping active ditches	The project mapped obvious outstanding active drainage on several Border mires, obtained through ground-truthing of aerials by walk over surveys. While this has revealed the most obvious drains, this method has its limitations, these being that 1) it is impossible to walk over an entire site for a realistic budget, and 2) it is also impossible to identify all the active drainage channels and their significance from a visual inspection of the surface only.
IPENS 071 Investigating potential water quality risks from growth. Water Quality Catchment Assessment: Detailed SAGIS spreadsheets - technical note	Nutrient pollution source apportionment modelling was undertaken for a suite of Natura 2000 catchments using the SAGIS model. The SAGIS work incorporated a spreadsheet based tool to enable scenario testing of different source reductions on water quality outcomes. This project provided a valuable early insight into the relative importance of different nutrient sources and the potential for positive change through different catchment interventions. It provided the basis for more refined and highly calibrated Natura 2000 modelling that has taken place subsequently using updated versions of the SAGIS modelling platform.
IPENS 072 Border Mires 3 – baseline mapping	IPENS funded the baseline mapping of one Border Mire, as a pre-curser to use of the monitoring tool developed through IPENS 070. This baseline will therefore be available forever as a vegetation reference for this particular mire, for future comparison.
IPENS 073 West Midland Mosses eco-hydrology investigation (not published)	This project brought together previous surveys and investigations, and made recommendations for works to progress re-naturalisation of the hydrological regime. The report has informed ongoing restoration and stimulated a successful bid for funds from the Defra Peat Project to carry out a major programme of tree and scrub removal and blocking/in-filling of drains for a total of £50,000 at Chartley Moss and Wybunbury Moss. The Area Team also secured £10,000 at Wybunbury Moss from the WEIF budget for a survey including levels and surface water features that will inform a plan to achieve complete re-naturalisation (in a 21st century context) of the site's hydrological regime.

Where a project is marked as ‘not published’, it may be because it comprises data or mapped output not suitable for publication via the Natural England publication catalogue or relates to sensitive species or locations. Any enquiries about IPENS evidence reports should be directed to enquiries@naturalengland.org.uk in the first instance.

Annex 6 IPENS and externally funded projects

Project bid / Coordinator	Success?	Was IPENS data used?	Value	Benefits for Natura 2000
LIFE Little terns 2012 (RSPB)	Yes	No – but there was liaison with IPENS whilst the projects ran concurrently	€1.6m LIFE €3.3m total budget	Improvement in conservation status of little tern *Sterna albifrons* in the long term via targeted action at the most important colonies, including 14 SPAs and 9 SACs
Cumbrian Bogs LIFE 2013 (Natural England)	Yes	Yes – bid developed in cooperation with IPENS to identify issues	£3.3m LIFE; £6.6m total budget	Restoration of 7120 degraded lowland raised mire habitats on Bolton Fell Moss SAC, South Solway Mosses SAC, and Roudsea Wood and Mosses SAC, aiming to achieve favourable conservation status
That's LIFE - Restoring Humberhead Peatlands 2013 (Natural England)	Yes	Yes – bid writers worked closely with IPENS to identify issues. IPENS referenced in bid text	€2.6m LIFE; €5.6m total budget	Restoration of 7120 degraded lowland raised mire habitats on Thorne Moor SAC and Hatfield Moor SAC and increase European nightjar (*Caprimulgus europaeus*) populations at Thorne and Hatfield Moors SPA
LIFE Hen Harriers 2013 (RSPB)	Yes	No	€1.1m LIFE €2.3m total budget	The aim is to provide the conditions in which hen harrier (*Circus cyaneus*) range and population recovery can occur, focussing on protection of hen harriers from illegal persecution
BureLIFE (Hoverton Wetlands restoration project-LIFE & HLF) 2014 (Natural England)	Yes	Yes – application referenced SIPs and IPENS programme	€3m LIFE; €5m total budget	Restoration of naturally eutrophic lake habitat to a species-rich, clear-water state. Work will also benefit EU priority habitats, such as calcareous fens with *Cladium mariscus* (7210*), and species such as otter, wigeon, gadwall and shoveler.
Roseate Tern LIFE – 2014 (RSPB)	Yes	No	€2.4m LIFE; €3.2m Total budget	Improve the conservation prospects of roseate tern (*Sterna dougallii*) in the UK and Ireland. Project will benefit 2 English SPAs: Coquet Island and Solent and Southampton Water.
MoorLIFE 2020 – 2014 (Peak District National Park Authority)	Yes	No	€12m LIFE; €16m total budget	Conservation and protection of the priority active blanket bog habitat within the South Pennine Moors SAC and the ecosystem services it provides.
Marches Mosses BogLIFE 2015 (Natural England)	Yes	Yes – liaison with IPENS for bid development. SIPs were used to identify issues and actions.	€5.3m LIFE; €7.1m total budget (including HLF contribution)	Restore active raised bog habitat and convert part of the degraded raised bog habitat, in order to progress Fenn`s, Whixall, Bettisfield, Wem and Cadney Mosses SAC towards favourable conservation status.

Shad-Severn (LIFE & HLF) 2015 (Severn Rivers Trust)	Yes	Yes – PAF and IPENS referenced in project application. SIP used to identify issues and actions	€7.8m LIFE €22.2m total budget (including HLF contribution)	Move towards favourable conservation status of the population of twaite shad (*Allosa fallax*) in the Severn Estuary SAC by significantly improving access for the population to spawning and nursery habitat and re-establishing access to 253 km of the former natural range of the species in the rivers Severn and Teme.
LIFE Blackwit UK – 2015 (RSPB)	Yes	No	€1.7m LIFE; €2.8m total budget	Improve the conservation status of the black-tailed godwit (*Limosa limosa*) in the United Kingdom, by recovering the UK breeding population. This project is focused on the two main breeding sites for this species in the UK, the Nene Washes SPA/SAC and Ouse Washes SPA/SAC.
RAPID LIFE 2016 (invasive alien species) (Animal and Plant Health Agency)	Yes	Yes – analysis of IPENS data and evidence from SIPs used in bid re number of SACs with invasive species issues	€682k LIFE €1.1m total budget	To deliver measures to reduce the impact and spread of invasive alien species (IAS) in freshwater, riparian and coastal environments in England. Conservation status of Natura 2000 sites will be enhanced and protected and there will be benefits for protected species, including white clawed crayfish (*Austropotamobium pallipes*)
Pennine Peat LIFE – 2016 (Durham County Council)	Yes	Yes – project objectives reference IPENS	€3.8m LIFE €6.5m total budget	Aims to demonstrate and evaluate geographically appropriate restoration techniques for priority habitat, blanket bogs (7130*), which are suited to the harsher climatic environment of northern England. The project will also develop and showcase a financial payment for ecosystem services (PES) mechanism under the UK Peatland Code. Will benefit 2 SPAs and 2 SACs.
Bats and Churches HLF 2016 (Natural England)	Yes – initial development funding granted	No	£3.8m HLF; £4.9m total budget	To trial new techniques to enable bats and church congregations to live together. Likely to benefit wider populations of bat species for which SACs are designated, even though not focussed on SAC sites.
Dynamic Dunescapes 2017 HLF and LIFE	HLF bid successful. Complementary English LIFE bid submitted.	Yes – SIPs used to evidence issues and actions	To be confirmed. Approx. £8m	Terrestrial Biodiversity Group priority project, to improve condition of sand dunes. Start-up phase is working on nine dune sites in England and Wales.
Saving England's Silver grasslands HLF and LIFE	Progress with bid has stalled	Yes - IPENS PAF priorities influenced the TBG project pipeline	To be confirmed.	Terrestrial Biodiversity Group priority project, to improve England's most important wet grasslands, including Somerset Levels.

Annex 7 Communication Plan

No.	Communication objective	Progress
1	Raise awareness of the Natura 2000 network, its importance and how it relates to our national biodiversity objectives and targets.	Awareness raising has continued through Natural England's internal work planning processes, Terrestrial Biodiversity Group and Major Landowners Group. The emphasis has started to shift post-EU exit referendum, with an increasing focus on international commitments (Bern & Bonn Conventions and UN Sustainable Development Goals 14 & 15 for life in water and on land) and how work on Natura 2000 sites helps to deliver our SSSI and wider biodiversity commitments, and contributes to the Natural England Conservation Strategy. Awareness raising within partner organisations via IPENS implementation steering group representatives contributes to the EU Action Plan for Nature, People and the Economy.
2	Raise awareness of the IPENS implementation work with stakeholders and Natural England and Environment Agency staff, and ensure they understand how it relates to their existing work programmes, and how they can engage with the work.	Awareness raising with stakeholders is ongoing via the IPENS Implementation Steering Group and other groups such as the SSSI Major Landowners Group and Terrestrial Biodiversity Group. Activity has included articles in the ENDS report, the DTA Habitats Regulations journal, NE press releases, internal workshops, articles on the Natural England intranet and in internal newsletters and briefings to the Natural England Protected Sites Delivery Network.
3	Ensure Biodiversity 2020 (Defra, 2011a) funding priorities are informed by IPENS findings	IPENS prioritisation data was used to inform the Terrestrial Biodiversity Group decision about funding priorities for the next 2+ years, and has fed into LIFE bids, including the APHA RAPID LIFE invasive species bid. IPENS data has been used in support of successful funding bids, including the Marches Mosses LIFE bid (see further information in Chapter 5: Evidence and Funding.
4	Engage relevant staff in shaping the IPENS prioritisation	Natural England specialists were heavily involved in advising the prioritisation process and reviewing the draft PAF content. A range of stakeholders had the opportunity to influence the prioritisation via a PAF consultation workshop.
5	Raise awareness of IPENS findings and the implementation programme with protected sites network	The Natural England Protected Sites Delivery Network has been kept in touch with PAF and IPENS implementation progress through agenda items in their regular meetings.

6	Informing Natural England's corporate planning for 2016/17	IPENS was well linked into the Terrestrial Biodiversity integrated planning project and continued to work with Area Teams to inform the 17/18 planning round.
7	Embed IPENS SIP guidance and other tools developed into day-to-day protected sites work	Prioritisation results have been linked to sites and Natural England Focus Areas. This facilitates their use for informing protected sites work in Area Teams.
8	Ensure Natura 2000 evidence needs are recognised with Natural England's, Environment Agency's and Defra's evidence teams	The focus to date has been to ensure PAF and IPENS data is available to Natural England and partner organisations to inform evidence and funding priorities. The PAF and SIP database have been provided to Natural England's Evidence team and the PAF is publicly available. SSSI Major Landowner Group partners are able to access a download of SIP data via the Natural England Designated Sites View system, to inform their evidence priorities.
9	Ensure latest PAF is publicly available	The PAF received ministerial approval and was submitted to Europe in May 2017. It is publicly available via the JNCC website: http://jncc.defra.gov.uk/default.aspx?page=6934.

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