



Investing in Natural Capital

Creating the right environment
for economic investment



June 2017



Picture: Flying Knot

Industry and nature in harmony in one of Europe's great estuaries

Contents

Executive Summary	4
1 Introducing natural capital	6
2 The economic value of the Humber's natural capital	7
Theme 1 - Flood risk management: Protecting life and property through investment in natural capital	9
Theme 2 - Ports and Shipping: The role of Spurn National Nature Reserve in protecting the shipping lanes of the Humber	10
Theme 3 - Health and wellbeing: The value of the natural environment to human health	11
Theme 4 - Property values: The critical role of the natural environment in supporting property asset values	11
Theme 5 - Nature Tourism: Building the nature tourism economy	12
Theme 6 - Towards a low carbon future: Carbon storage in the Humber estuary	13
3 A natural capital vision for the Humber	14
4 Achieving industry and nature in harmony	17
4.1 Investing in natural capital alongside economic development	17
4.2 Investing in natural capital alongside flood risk management	18
4.3 Investing in natural capital alongside developing the tourist economy	20
4.4 Investing in natural capital alongside access and soft transport	22
5 About Humber Nature Partnership	23

Executive Summary

The waters of the Humber Estuary create a dynamic landscape. Its attraction lies in a constantly changing appearance and mood due to the tide, changing coastal weather and human activity. The hinterlands of the estuary have a rich cultural heritage and a sense of remoteness and peace close to major urban areas that have grown around the Estuary. Wildlife of international importance, nature reserves, country parks and major visitor attractions are significant destinations and sites of particular interest for visitors. The estuary is a unifying presence: a special resource for access and enjoyment and has a significant potential value to the area, to the wellbeing and health of the people who live in and around the estuary, for recreation and critically as the bedrock of the local economy based on its ports, industry, agriculture and settlements.

The flat lands of much of the estuary hinterland are perfect for development, however, as with many other low lying areas of the country, they are prone to flooding. Events such as those of the 5th December 2013 have shown that we simply can't afford to build our way out of the predicament.

Capital investment and maintenance costs make the prospect of an impregnable flood barrier for the whole estuary uneconomic. Working with the environment can alleviate some of these costs. For example by taking advantage of the coastal habitats which reduce wave energy allowing smaller, cheaper defences. We have to tackle climate change and working with the environment will help us to achieve this at least cost.

The Humber ports, together some of the most important trading infrastructure in the UK were not located here by luck. They are taking advantage of the unique topographical environment of the estuary. The estuary's shape offers calm waters and safe haven. Spurn peninsula protects the estuary from the worst of the North Sea storms. It ensures the deep water channel, so vital to the ports, is maintained only by moderate dredging. We shouldn't take these assets for granted.

Whilst jobs and prosperity are a priority, a happy, healthy work force is also a huge investment draw. Access to green space, to fresh air and to wild places is proven to lift the spirits and offer

great opportunities for exercise and recreation. A first class environment will help to attract and hold on to first class entrepreneurs, improve property values and attract a healthy and willing work force.

The internationally important habitats and the hundreds of thousands of birds and other wild creatures that depend on them are an economic asset in their own right. Nature tourism is one of the fastest growing sectors in the UK. Locally, it is worth about £9 million a year, benefitting some of the hardest to reach sections of our communities, but this income could readily be doubled with the right investment.

This document illustrates why investment in natural capital is a critical part of any attempt to improve the prosperity and quality of life of the Humber's communities and also to meet the challenges of climate change. It sets out a series of themes where natural capital currently supports the Humber's economy and highlights opportunities where natural capital can be enhanced to ensure the future economic potential of the Humber.

In order to secure this future potential Humber Nature Partnership calls on strategists, planners and decisions makers with the ability to deliver change around the Humber to work together to:

- 1** Create a single inclusive, all-encompassing vision for the Humber which addresses the needs for
 - Sustainable economic growth
 - Social well-being and community cohesion
 - Well-managed natural capital
- 2** Rebuild the image of the Humber as a 21st century landscape, where fully integrated, multi-purpose planning provides the best environmental settings and the right skills and services to attract high quality investment.
- 3** Invest directly in natural capital projects to maximise the value of these overlooked resources to the economic prosperity of the region and for the benefit of all.



1. Introducing Natural Capital

Natural capital is defined by the Government's Natural Capital Committee¹ as:

"Those elements of nature which either directly provide benefits or underpin human wellbeing."

The term natural capital therefore embraces the more immediately obvious assets associated with land (such as woodlands, fields and urban parks), the water environment (for example, rivers, lakes, groundwater and seas) and the atmosphere (for example, clean air and an equable climate). However, natural capital also includes the myriad processes which underpin and generate the services which the natural environment provides (for example, the water cycle, soil fertility processes and atmospheric gas exchange). Therefore, natural capital comprises, quite literally, a wealth of component parts; parts whose sum underpins not only all economic activity but life on earth itself.

If properly measured and managed, the living aspects of natural capital, at least, can continue to provide these (ecosystem) services and benefits indefinitely. Whilst some of the benefits can be measured and are clear to see (for example, timber has a market price), others are difficult to quantify and are often invisible in our day to day lives. This often results in natural capital not being properly accounted for in decisions about what to produce and consume; the risk being that we fail to manage it sustainably. In many cases, we are only just beginning to gain the level of understanding necessary to measure the enormous economic value of our natural capital.

Natural capital underpins our economy in exactly the same way that financial and human capital is required to enable economic activity. Increasingly, economists are beginning to understand the value of natural capital in sustaining prosperous economies, while also understanding the risks of degrading natural capital. For example, Mark Carney, Governor of the Bank of England², noted that the insurance costs for extreme weather events had already increased five-fold since the 1980s and these are now factored into insurance premiums. In 2011 the Government committed to working with Office for National Statistics to incorporate natural capital into the UK Environmental Accounts by 2020 so that the benefits of nature would be better recognised³.

¹ Natural Capital Committee (2013) The State of Natural Capital. HM Government.

² www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx

³ The Natural Choice: securing the value of nature. HM Government White Paper (2011)



2. The economic value of the Humber's natural capital

The Humber is an extraordinary region – one that is still teeming with wildlife yet also has the potential to power the economy of the Northern Powerhouse. That the region is exceptionally vulnerable to flooding serves to emphasise the importance of sustaining the natural flood defence function of the natural system. Natural capital sustains primary production as well as fundamentally important parts of the economy such as property asset values, tourism and shipping.

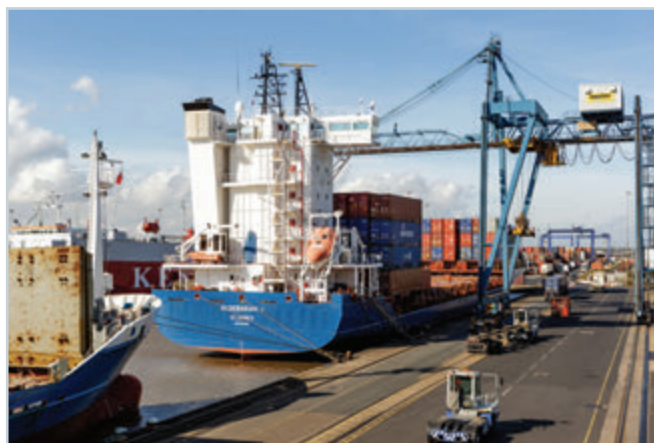
The Humber Strategic Economic Plan sets out how the Humber Energy Estuary can help Britain meet its climate change targets, through the development of the renewable energy industry and recognises the importance of the Humber's natural systems in supporting the area's future prosperity.

The natural capital of the Humber region should not be seen as something to 'balance off against' or constrain economic growth, rather that it is essential to economic growth through, for example, a healthier and more productive workforce enjoying good access to greenspace, to promote inward investment, or through the judicious deployment of legislation that helps to ensure development is sited appropriately and the natural capital of the estuary is not diminished. Economic strategies for the Humber must therefore recognise the fundamental importance of the Humber's natural capital and facilitate investment in that natural capital or risk failing to secure the Humber's huge future economic potential.

Humber Strategic Economic Plan

"The Humber has a rich ecosystem. Green and blue infrastructure should be promoted to support wider economic development objectives. This includes the role of green and blue infrastructure in providing tourism assets, enhancing land and property values and supporting job creation and health and well-being. Through properly considered environmental assessment, the introduction of flood alleviation schemes can both be designed to increase biodiversity through careful management of the land and intertidal areas. Inland flood measures can improve water quality and associated biodiversity. Sustainable drainage design can recharge our water resources reducing production and transportation costs of this precious resource".

p88, [Humber Strategic Economic Plan \(2014\)](#)



Port of Hull - ABP/Karl Andre



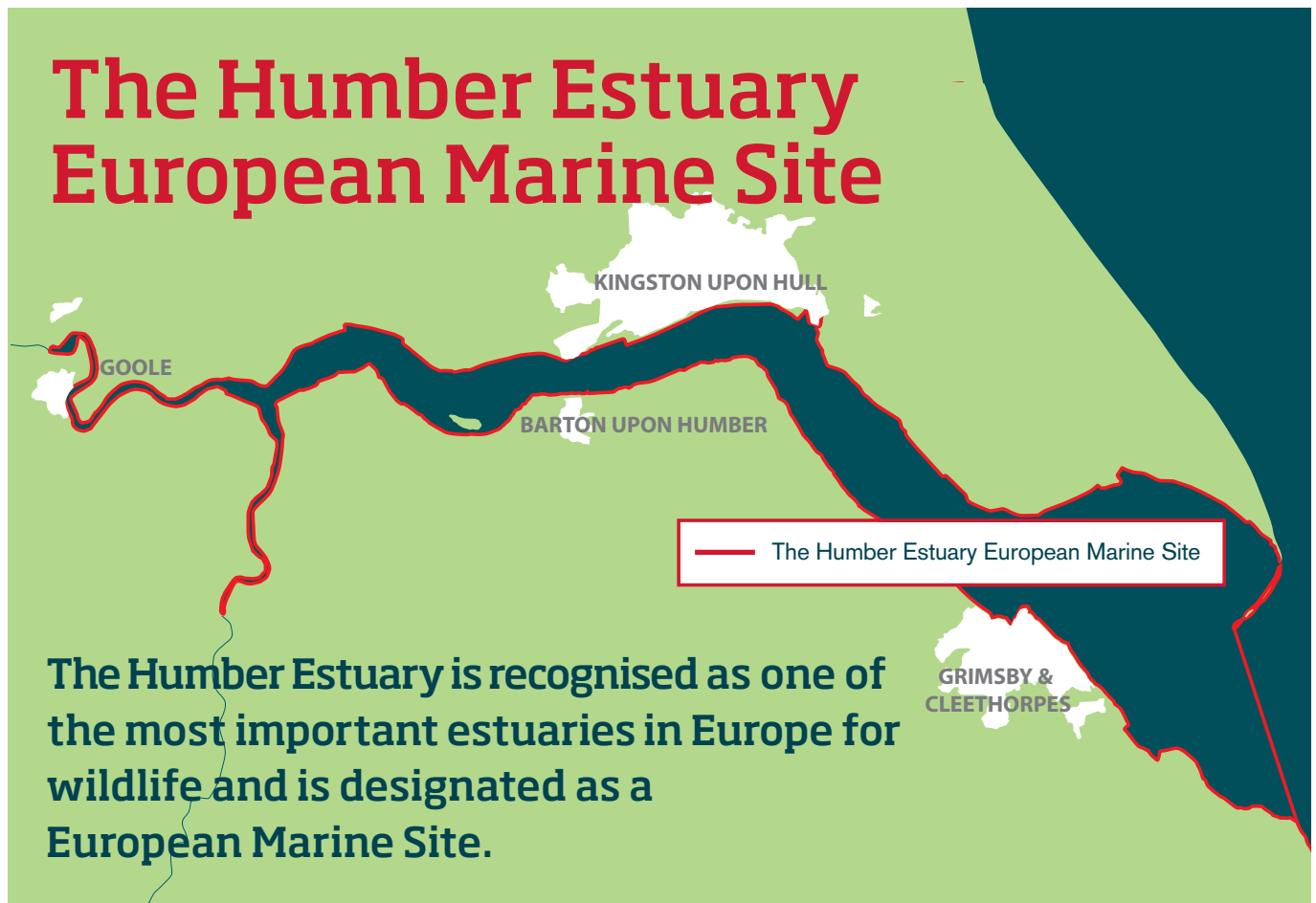
Protecting the Estuary Asset

The Habitats Regulations are the cornerstones of the UK's biodiversity policy for the conservation and sustainable development of the 'Natura 2000' network of Special Areas of Conservation (habitats – SACs) and Special Protection Areas (for birds – SPAs). The Habitats Regulations give us a policy grounding to help protect the most precious natural sites and rare species, provide a level playing field for business and are part of upholding better environmental standards.

The Regulations do not aim to exclude socio-economic activity but to ensure sustainable development – development that does not compromise the needs of future generations. The regulatory systems that underpin the protection of these sites are set up to enable a logical, transparent and evidence-based step-by-step process to ensure sustainable development. Developers can see a clear audit trail and be assured that decisions have not been taken arbitrarily but on the basis of scientific evidence. Reviews of the Regulations show that they are, in

the main, working well, but more can be done to ensure the protections of sites and species. Recommendations to streamline some processes have been put into place on the Humber.

It is critical that we understand the role of natural capital in sustaining the prosperity of the Humber region especially given its sensitivity to flooding. The value of natural capital to the Humber's economy and ultimately to the health, well-being and prosperity of the region can be divided into six main themes.



Theme 1

Flood risk management: Protecting life and property through investment in natural capital

The Humber's saltmarsh habitat is one of the Estuary's protected features, under the auspices of the Habitats and Birds Directives. There are 630 hectares of saltmarsh on the Humber, accounting for 2% of estuarine area, compared to a national average of 6%. Saltmarsh, mudflats and other intertidal habitats are natural flood defences. They act as buffers, offering protection to our coastlines by absorbing wave energy. Recent research shows that saltmarsh is very effective at reducing the impact of severe floods, when waves and water levels are highest⁴. Protecting, enhancing and creating this intertidal habitat, and allowing it to adapt is a priority. Managed realignment sites like Alkborough Flats and Donna Nook are a response to this priority, and form part of the overall strategy for managing the risks to communities from tidal flooding.

The UK Natural Ecosystems Assessment (2011) sets out the importance of saltmarsh for protecting economic assets from the impact of tidal flooding.

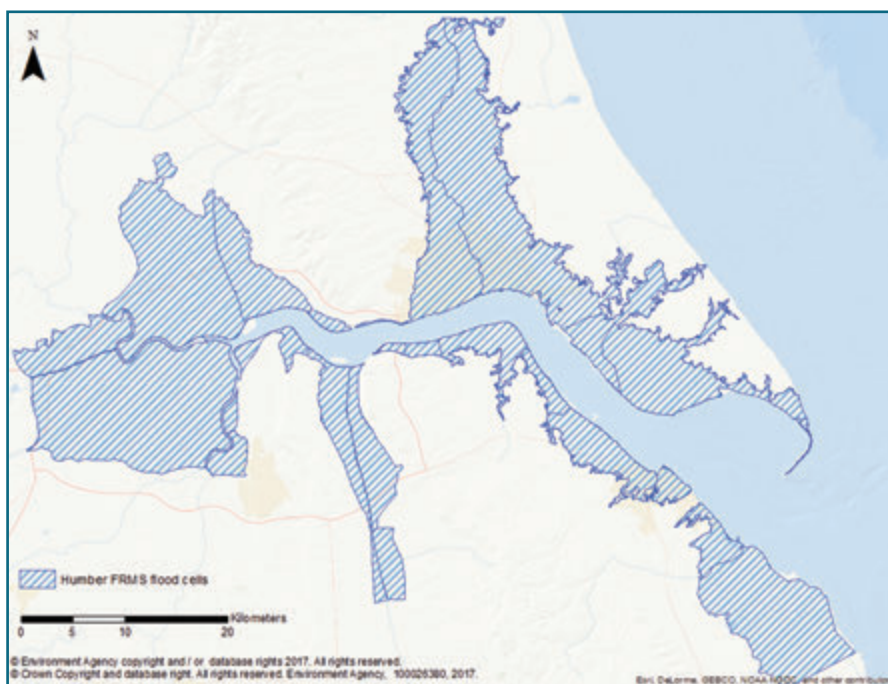
“Under average tidal inundation depths, up to 50% of wave energy is dissipated in the first 10 – 20m of a vegetated saltmarsh surface while an 80m strip can reduce the height of a seawall needed for

landward defences from 12m to only 3m (resulting)...in capital cost savings of £2,600 – £4,600 per metre of seawall (1994 prices). More recent Environment Agency guideline average costs of building seawalls are £ 1,522 per metre (Environment Agency 2007); scaling this figure by coastline length of saltmarsh, rather than area, gives a capital cost saving of £2.17 billion on sea defence for England.”

Alkborough Flats managed realignment site was conceived as part of the Humber Flood Risk Management Strategy as an opportunity to maintain internationally important wildlife assets and deliver tidal flood storage. It was built in 2004-5 and opened in 2006, costing £ 10.2m. The site is 440ha of which 170ha are regularly inundated and the site as a whole is designed to fill occasionally for flood storage purposes. It provides:

- A very large flood storage area and volume, which helps defer defence improvements, and reduces the impacts of flooding in this part of the Humber
- Improved access to quality environments
- Benefits for the community and local businesses
- A diverse range of habitats. Fifty different species of birds and huge overall numbers have been recorded using the site. Alkborough Flats also provides a valuable fish nursery area.

Modelling shows that Alkborough Flats significantly reduced the impacts of the December 2013 tidal flood reducing the flood volume by about 7% and Environment Agency work to assess the broader services provided by the Alkborough Flats scheme estimates that it yields an enhanced benefit to cost ratio of 3.22, based on a very conservative valuation⁵.



Humber Flood Risk Management Strategy flood cells - Environment Agency

⁴ Möller, I.; Kudella, M.; Rupprecht, F.; Spencer, T.; Paul, M.; van Wesenbeeck, B.K.; Wolters, G.; Jensen, K.; Bouma, T.J.; Miranda-Lange, M.; Schimmels (2014) Wave attenuation over coastal salt marshes under storm surge conditions, *Nature Geoscience*, 7, 727–731

⁵ Everard, Mark (2009) Ecosystem services case studies: Better regulation science programme. In house Environment Agency Study

Theme 2

Ports and Shipping: The role of Spurn National Nature Reserve in protecting the shipping lanes of the Humber

An essential part of the Humber port infrastructure is the natural processes which take place to form the network of deep-water channels that allow the movement of commercial shipping. The spit at Spurn acts as a natural breakwater for the estuary, without which the essential deepwater channels would silt up. Losing the

Humber deep-water channels would be catastrophic to the UK and Humber economy.

As an island, Britain is dependent on its ports and their associated supply chains to maintain our quality of life and economic wellbeing. 95% of all of the UK's imports flow through the UK's ports. Associated British Ports (ABP) is the UK's largest port operator handling about a quarter of the UK's seaborne trade through its 21 ports. Of these, the Humber (serviced by four main ports at Grimsby, Immingham, Hull and

Goole) is the UK's busiest trading estuary, with around 30,000 commercial shipping movements every year, representing some 17% of the UK's seaborne trade. This trade contributes about £2.2 billion to the UK economy every year, including £1.5 billion to the Humber region, supporting ca. 23,000 jobs in the region and an ca. 33,000 jobs nationally. For example, fuel brought in through Hull and Immingham supplies about 10% of the UK's energy needs, whilst Immingham is responsible for about 28% of the UK's oil refining capacity.



Spurn National Nature Reserve – George Stoyle



Theme 3

Health and wellbeing: The value of the natural environment to human health

The economic and social costs of mental illness in England are estimated at £105.2 billion for the year 2009/2010. There is much evidence that people with better access to the natural environment tend to be happier and less prone to mental illness. Reduced health treatment costs alone of £2.1 billion have been estimated⁶. Separate to cost reductions within the NHS (predictions of which are unstable in the current political and economic climate) we know that interaction with the natural world has personal and

community benefit. People are thought to feel the benefits through exposure to nature, by providing space for social contact and providing places for physical activity.

People who live within 500m of accessible green space are 24 per cent more likely to meet recommended levels of physical activity. Reducing the sedentary population by just 1 per cent would reduce morbidity and mortality rates valued at £1.44 billion for the UK as a whole. The quality of greenspace has been shown to be important for mental health and the Mappiness project⁷ found that people were most happy in coastal and marine areas compared to urban areas. The natural

environment provides benefits for our health through better air quality, temperature regulation, cleaner water and reduced risk of flooding. For example, air pollution reduces the average life expectancy by 6 months per person – a loss valued at £16.4 million per year⁸. It is estimated that urban air-quality causes 40,000 premature deaths a year and reduces productivity, which together costs the economy at least £20 billion per annum⁶. It also has a significant negative impact on life prospects for children, e.g. by lowering educational achievement⁷. Vegetation, trees and green infrastructure also reduce air pollution particularly in urban areas.

Theme 4

Property values: The critical role of the natural environment in supporting property asset values

There is an increasing recognition that productivity (in terms of staff recruitment and retention, worker output, loyalty, reduced sickness

etc.) of staff are boosted by natural elements - plants, fresh air and an attractive outlook; high value offices need to be functional and attractive. A logical step is to set offices in a natural setting, setting them apart from conventional city centre and business park spaces and making them more desirable to potential

occupiers. For example, Wykeland has within its portfolio a wide range of commercial buildings and has found that those such as Bridgehead which are set in more attractive environments generally attract higher rental values than equivalent offices in less attractive areas.



⁶ Natural Capital Committee (2015) Third Assessment of Natural Capital. HM Government

⁷ www.mappiness.org.uk

⁸ DEFRA (2010) Air Pollution in a Changing Climate. HM Government

Theme 5

Nature Tourism: Building the nature tourism economy

12

Tourism is one of Britain's biggest industries and is a critical part of the local economy. Indeed, on the relatively disadvantaged coastal part of East Yorkshire, tourism is the bedrock of the local economy. A study by Leeds Beckett University showed that wildlife tourism adds £9 million per year into the East Yorkshire economy, supporting about 170 jobs.

Nature tourism or wildlife tourism involves people travelling to an area to take part in outdoor

activities such as birdwatching, whale watching, boat trips, photography, walks and/or cycling to learn about and experience wildlife. These visitors are often keen to support the environment and wildlife too, seeking out 'eco-friendly' places to stay or visit, or locations to enjoy locally sourced food.

The North Bank of the Humber is a good example where East Yorkshire has a rich wildlife heritage with some spectacular sites. Sites that are specifically managed for their wildlife include: Bempton Cliffs (RSPB), Blacktoft Sands (RSPB), Flamborough Cliffs (YWT), North Cave Wetlands (YWT), Spurn Point (YWT) and

Tophill Low (Yorkshire Water) amongst many others.

A useful benchmark is North Norfolk, where the nature tourism economy is worth £60 million per year, despite that area being smaller. The difference is that North Norfolk had the very first nature reserves in Britain and now has a series of sites with excellent visitor facilities. The Leeds Beckett University study suggests that even with limited investment in sites such as Flamborough and Spurn, the economic value of nature tourism can be rapidly increased to £30 million per year, supporting over 500 jobs – highly significant given relative disadvantage along the coast.



Alkborough Flats – Joanna Richards

³ Möller, I.; Kudella, M.; Rupprecht, F.; Spencer, T.; Paul, M.; van Wesenbeeck, B.K.; Wolters, G.; Jensen, K.; Bouma, T.J.; Miranda-Lange, M.; Schimmels (2014) Wave attenuation over coastal salt marshes under storm surge conditions, *Nature Geoscience*, 7, 727–731

⁴ Everard, Mark (2009) Ecosystem services case studies: Better regulation science programme. In house Environment Agency Study

Theme 6

Towards a low carbon future: Carbon storage in the Humber estuary

Our climate is already changing and the Humber Strategic Economic Plan identifies the critical role of the Humber region in managing this threat through the de-carbonisation of the British economy. The Humber is well placed to become the 'energy estuary' of Britain, supplying low carbon renewable power to sustain the UK's energy demand. The challenge of climate change is, of course, considerable. As well as mitigating the causes of climate change, i.e. reducing greenhouse gas emissions, society needs to adapt to its impacts. Managing flooding requires sustained investment in both natural and hard flood defences. There is a clear recognition of the economic, social and health impacts that flooding has had in the area and the Humber LEP has clear strategies set out in the Strategic Economic Plan and European Structural Investment Plan.

We also need to enable natural systems to reduce greenhouse gases that are now polluting the atmosphere by sequestering carbon into long-term stores. The most important of those systems are our seas and our soils, especially peat soils that are still extant in the Lower River Hull valley for example. One of the more important natural carbon sequestering systems in the Humber region is the estuary itself.

Coastal and marine ecosystems play a particularly valuable role in the capture and storage of atmospheric carbon dioxide CO₂. Termed blue carbon, vegetated coastal ecosystems such as seagrass beds, salt marshes and mangrove forests contribute much greater to long-term carbon storage per unit area of habitat than terrestrial forests⁹. In part, this is due to the ability of marine and tidal habitats to trap suspended matter and associated organic carbon during tidal cycles.

A rough calculation of the ecosystem service benefit of this accumulation can be provided using the following approach:

- Long-term steady state accumulation of sediment over the Humber intertidal and subtidal mudflats tracks mean sea level rise at about 1mm per year¹⁰
- Using the known average concentrations of particulate carbon (C), nitrogen (N) and net particle reactive phosphorous (P, i.e. in excess of natural background sediment P) in Humber mudflat sediments, then about 2,400t of organic C (Corg), 216t of organic N (Norg) and 144t of particle reactive P are buried in Humber sediments annually.
- The thickness of Holocene intertidal sediment in the Humber averages about 2 metres (EA).

- Assuming an accumulation rate of 1mm per year throughout the Holocene (2400 t organic C per mm) then: 2400 t C x 2,000 (mm) = 4.8 million tonnes have accumulated in the Humber's sediments.
- Using an estimate of £60 to capture and store a tonne of carbon¹¹, the equivalent cost of capturing and storing 4.8 million tonnes of carbon is £288 million.

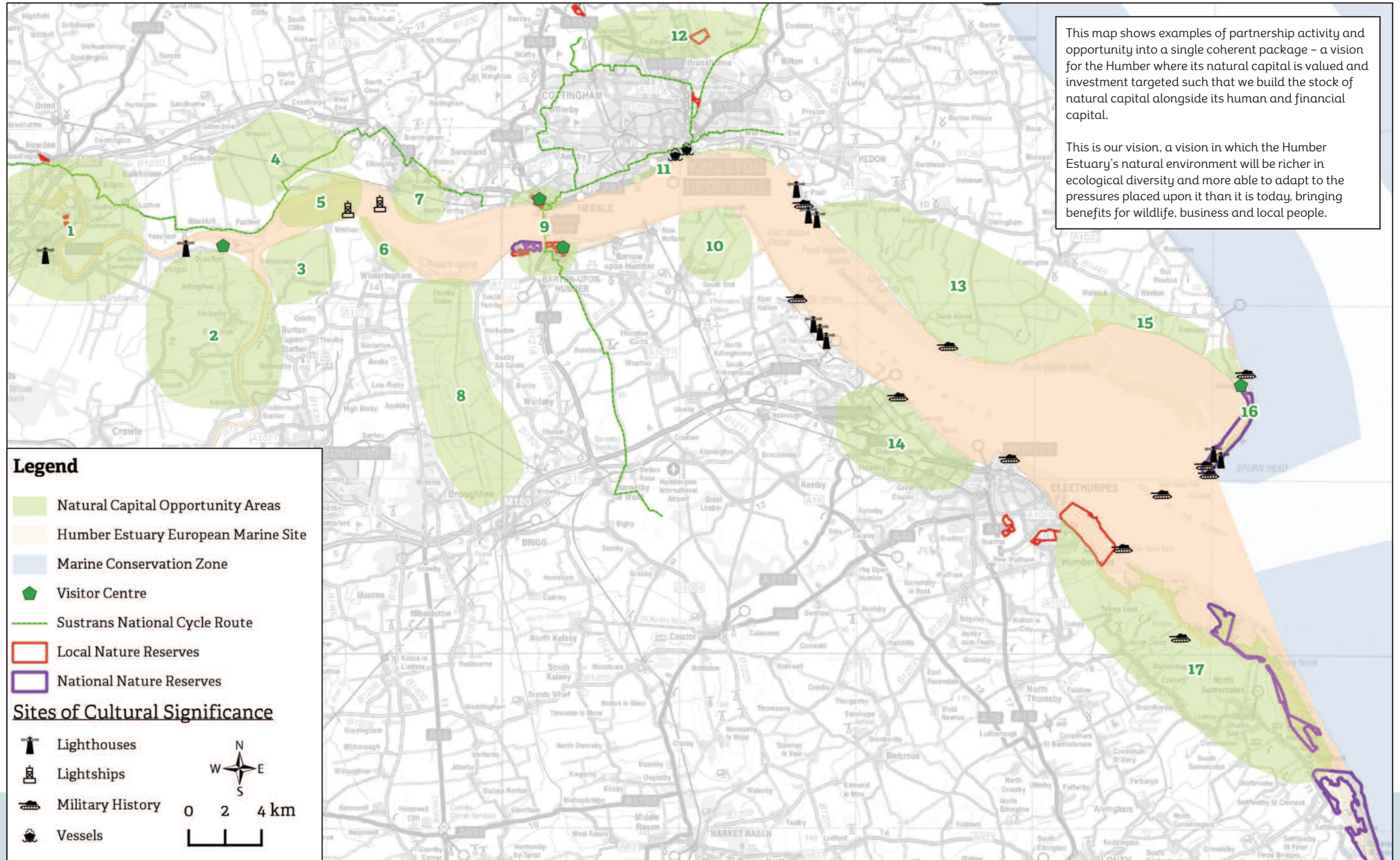
⁹ McLeod E, Chmura GL, Bouillon S, Salm R, Bjork M, et al. (2011) A blueprint for blue carbon: toward an improved understanding of the role of vegetated coastal habitats in sequestering CO₂. *Frontiers in Ecology and the Environment* 9: 552-560.

¹⁰ Andrews, J. E., Samways, G., Dennis, P. F. and Maher, B. A., 2000. Origin, abundance and storage of organic carbon and sulphur in the Holocene Humber Estuary: emphasising human impact on storage changes. In Shennan, I. and J. Andrews, J. (Eds), *Holocene Land-Ocean Interaction and Environmental Change around the North Sea*. Geological Society Publishing House, Bath, UK. *Geol. Soc. Spec. Publ.* 166: 145-170

¹¹ www.ccsassociation.org/why-ccs/affordability

3. A natural capital vision for the Humber

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This map shows examples of partnership activity and opportunity into a single coherent package – a vision for the Humber where its natural capital is valued and investment targeted such that we build the stock of natural capital alongside its human and financial capital.

This is our vision, a vision in which the Humber Estuary’s natural environment will be richer in ecological diversity and more able to adapt to the pressures placed upon it than it is today, bringing benefits for wildlife, business and local people.

1 Goole Hinterland: opportunities for habitat creation and green infrastructure enhancement through the development of upper estuary flood defences to link the Goole townscape back to the River Ouse frontage.

2 Greater Blacktoft: opportunities to expand wildlife habitat linked to Blacktoft nature Reserve through Countryside Stewardship, water storage for irrigation and flood prevention measures.

3 Alkborough Flats: opportunities to improve the visitor facilities at Alkborough Wetlands linked to further habitat improvements/ creation to develop the wider tourism economy of the North Lincolnshire Humber frontage.

4 North Cave Wetlands: through gravel extraction, countryside stewardship and green infrastructure installation linked to new developments, provide a greenspace link between the Wetlands and the estuary.

5 Broomfleet: enhancement of wetlands created from old clay pits developing a green infrastructure network of accessible habitat and improving habitat for rare breeding wetland birds such as bittern.

6 Read's Island area: create new habitat along the estuary close to Read's Island to expand habitat for rare breeding birds.

7 Brough: development of green infrastructure linked to the redevelopment of Brough Airfield to create public greenspace between Brough and North Ferriby.

8 Ancholme Valley: potential for large scale wetland restoration integrated with flood risk management and eco-tourism.

9 Humber Bridge: multi-functional green infrastructure focussed on access and habitat creation/enhancement, centred on the Barton Clay pits and Humber Bridge Country Parks.

10 Goxhill: potential new managed realignment site at East Marsh.

11 Hull Waterfront: green infrastructure improvements along the Humber Trans-Pennine Trail linking the Humber Bridge Country Park to Alexandra Dock via naturalistic and urban greenspace development.

12 Hull Green Arc: linkage of Noddle Hill and Loglands Local Nature Reserves via major flood prevention and water storage scheme.

13 Paull-Cherry Cobb-Sunk Island: opportunities for large scale habitat creation through managed realignment and habitat compensation schemes.

14 South Humber Gateway: an area where a world class economy can prosper alongside a world class environment.

15 Skeffling-Welwick: opportunity to create new habitat to link Welwick nature reserves to Spurn via habitat loss compensation programmes, managed realignment and linked into the development of eco-tourism in Holderness.

16 Spurn National Nature Reserve: major opportunity to develop Spurn NNR as the centrepiece of eco-tourism in Holderness, through visitor facilities development, habitat extension and enhancement.

17 Cleethorpes to Donna Nook: clear opportunity to develop the area for ecotourism extending the seaside resort visitor offer of Cleethorpes through new visitor facilities and habitat creation/enhancement, partly linked to habitat loss compensation programmes via managed realignment.



4. Achieving industry and nature in harmony

Humber Nature Partnership's ambition is "Industry and nature in harmony in one of Europe's great estuaries". This section sets out how, by working in partnership to realise some of the above opportunities we can achieve that ambition.

4.1 Investing in natural capital alongside economic development

The development of the Humber as Britain's sustainable energy estuary is a critical part of the UK's plan to reduce the impacts of catastrophic climate change. Such development has to be taken forward in a way that does not damage the existing natural capital of the Humber.

Developments such as Green Port Hull and strategies such as the South Humber Gateway Mitigation Strategy provide real world examples of how this can be achieved.

Green Port Hull

Green port Hull is a new facility at Alexandra Dock in Hull which will produce and export marine wind turbines. The development involves modifications to the existing enclosed dock plus a new solid quay built into the estuary. Key issues have included impacts on the habitats and species of the Humber Estuary designated site. Intensive discussions pre and post submission has enabled a package of mitigation and compensation measures to be agreed. This has taken time and careful



consideration but, with the Habitats Regulations setting out the parameters for the various decisions, the development has been given permission to progress within a Natura 2000 site, even though it will cause damage.

Compensation was therefore delivered in advance of the development. The package of measures agreed to offset the damage includes 10.5 ha of estuary habitat creation at Alkborough Flats and Chowder

Ness managed realignment site, and a roosting structure to replace the old wooden jetty previously used by large numbers of turnstone. Habitat creation conserves displaced internationally important bird populations and has provided better recreational space for visitors and contributes to flood alleviation along the Humber.

South Humber Gateway Mitigation Strategy

The South Humber Gateway is located on the south bank of the Humber estuary in northern Lincolnshire. Covering an area of approximately 1,000 hectares it represents one of the largest potential development areas in the UK. In recent years there has been significant development interest in the area particularly from the emerging renewable energy industry on the Humber.

The area is immediately adjacent to the Humber Estuary which is recognised for its importance for wildlife at both national and international levels through various designations. As such, great care is required when undertaking works which may result in negative impacts on the wildlife interest features of the Estuary. A potential conflict therefore exists between the need to develop the South Humber Gateway's economic potential for the benefit of the national economy and the legal obligation to ensure that its wildlife is protected. By working in partnership it has been possible to develop a strategic approach to the issue of providing the required ecological mitigation for developments taking place in the area. This approach is being embedded within strategic planning documents for North and North East Lincolnshire.

Once the strategy is fully implemented it will help to ensure a smoother route to development for businesses on the South Humber Bank alongside the provision of high quality habitat required by

wading birds in the area. Humber Nature Partnership believes that this will be the first time that such a scheme has been successfully established at this scale nationally.

The Hull and Humber City Deal, signed by the Humber Local Enterprise Partnership, has an aspiration to maximise opportunities linked to the investment in energy generation and other sectors. Good quality environmental data is fundamental to realising these aspirations particularly in relation to the development of a Humber Habitat Compensation and Mitigation Plan to help accelerate sustainable development. This can build on an existing approach set out in the South Humber Gateway Mitigation Strategy.

The importance of good data

Sustainable development requires good ecological data. Some of this data has been provided by the Humber Nature Partnership through the 'South Humber Gateway Ecological Study' that surveyed the South Bank to provide detailed ecological data to underpin, for example, the environmental impact assessments required for major infrastructure proposals. Other data is held by the North and East Yorkshire Ecological Data Centre and Lincolnshire Environmental Records Centre and is routinely used for individual planning applications; providing a service for developers and facilitating growth.

4.2 Investing in natural capital alongside flood risk management

Green infrastructure (GI) composes a set of greenspace networks that together provide multiple services to underpin people's quality of life and economic prosperity. Such services include: storm water management, climate adaptation, less heat stress, more biodiversity, food production, better air quality, sustainable energy production, clean water and healthy soils, as well as increased quality of life through recreation and providing shade and shelter in and around towns and cities.

Investing in GI is a necessary prerequisite for economic prosperity, particularly given the fragility of the Humber region to flooding.

Two examples are given that require sustained investment to achieve – natural flood storage and enhancing the estuary frontage to promote the setting for investment and increase property values

Natural flood defence and mitigation

The Humber Flood Risk Management Strategy (2008) identifies potential areas for flood storage to be developed in the medium term. The Environment Agency is working with the University of Hull as part of the Dynamic Humber project to better understand the Estuary and the interaction with flood management. This includes evidence that will help ensure flood storage around the Estuary is in the most effective location. This evidence will inform the Strategy update and the Environment Agency will continue to investigate options with partners including

any communities potentially affected.

Given a reduction in storm waves height across flooded salt-marsh and mud flat, it clearly makes sense to increase the area of salt marsh and mud flat when replacing flood defence walls/embankments by moving those banks inland (managed realignment). This both resolves issues of 'coastal squeeze' (the loss of salt marsh and mud flat between a rising sea-level and hard flood defence) and provides improved nature tourism potential.

Enhancing the Estuary Frontage

There are significant opportunities for the Estuary frontage to be

redeveloped in ways that deliver economic, social and environmental objectives, efficiently. The Humber Estuary Landscape and Green Infrastructure Study explores ideas and partnerships that will tackle flood risk management and improve the water environment in creative, multidisciplinary ways. It is an aspirational study that provides examples of how concept designs might work in different settings around the estuary based on information and ideas shared by partners.

In each case the focus is on the inter-dependence of GI projects and the scope for partnership working to deliver investment on an ambitious scale.



Exemplar opportunities to improve green infrastructure alongside flood defence improvements at Hull - Environment Agency/Sheils Flynn

4.3 Investing in natural capital alongside developing the tourist economy







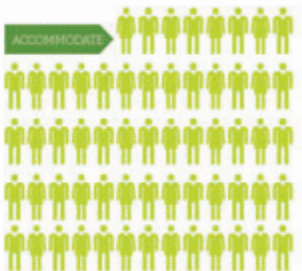



A well developed and managed nature tourism offer is an important component of developing economic prosperity in the Humber region. Whilst the overall contribution to economic activity is always likely to be relatively small in comparison to the role of shipping, manufacturing and energy for example, its local contribution can be much more significant as the visitor economy is composed of many hundreds of micro-business that sustain very local economies. Local micro-business enable investment to recirculate locally, creating more resilient local economies. For the Humber, nature tourism investment could unlock

economic prosperity in some of the most isolated communities that have relatively high levels of economic disadvantage such as Holderness or Grimsby.

Moreover, such investment has deeper ramifications in terms of building the Humber's overall quality of life by providing high profile nature destinations to visit, enhancing investor's perceptions of the Humber as a high quality destination and place for investment. Further, by enhancing recreational accessibility through green infrastructure investment, nature tourism investment and investment in soft transport solutions (walking and cycling), very significant health benefits can be realised. The following examples illustrate such benefits.

Spurn National Nature Reserve
Yorkshire Wildlife Trust's Spurn National Nature Reserve is an extraordinary place – a sweeping arc of sand stretching off the SE corner of Yorkshire across the mouth of the Humber. It is Special Protection Area, a Special Area of Conservation, a Site of Special Scientific Interest, a Geological Conservation Review Site, a Ramsar site and has listed buildings. People visit Spurn for its wild beauty, its wildlife, for a day on the beach, to watch ships, for angling and bait digging, to examine its rich history or simply to reach the 'end of Yorkshire'. At one time, Spurn was visited by about ca. 70,000 visitors per year though in recent years, this dropped to ca. 40,000 visitors.

The proposed visitor centre will...

 <p>IMPROVE THE PROTECTION OF SPURN'S WILDLIFE</p>	 <p>IMPROVE THE SAFETY OF SPURN'S VISITORS</p>	<p>CREATE</p>  <p>19 NEW JOBS AND 6 APPRENTICESHIPS</p>	<p>BENEFIT 3000 LOCAL CHILDREN</p> 
<p>GIVE A BOOST TO THE LOCAL NATURE TOURISM ECONOMY OF</p> <p>£20 MILLION</p> <p>OVER 25 YEARS</p>	 <p>PROVIDE A FLOOD RESILIENT BUILDING</p>	 <p>2075</p> <p>BENEFIT VISITORS TO SPURN FOR 60 YEARS</p>	<p>ACCOMMODATE</p>  <p>60,000 PEOPLE ANNUALLY</p>
<p>OPEN FACILITIES FOR</p>  <p>COMMUNITY GROUPS</p>	<p>BE PART OF A</p> <p>£1.5 MILLION</p> <p>INVESTMENT IN SPURN</p>	 <p>PROVIDE NEW FACILITIES TO RNLI AND ASSOCIATED BRITISH PORTS</p>	 <p>REDUCE DISTURBANCE IN THE VILLAGE</p>

In December 2013, the storm surge destroyed the road across the narrowest point of the spit. Access is now by 4-wheel drive only and visitors can only access the site by walking, cycling or taking YWT's 4WD Unimog 'Spurn Safari'. Whilst visitor numbers have dropped to about 20,000 per year, they are now concentrated at the entrance to the site.

Increasingly, YWT are struggling to manage the site effectively given very few visitor facilities. YWT have therefore proposed, in partnership with E.ON who are providing the funds, to build a new visitor centre at Spurn that will provide good visitor facilities (café, shop, education facilities, toilets, proper car-parking). This will enable the charity to manage the site such that visitors have a safe, informed and enjoyable visit and crucially do not accidentally damage the fragile environment they have come to visit.

There are also opportunities to link ambitions to other proposed projects, like Skeffling managed realignment, to ensure integrated proposals develop efficiently from the outset.

Donna Nook-Tetney Marshes

An example of the value and potential of nature tourism on the south Humber bank is provided at Donna Nook National Nature Reserve, near Saltfleet, which is managed by Lincolnshire Wildlife Trust in partnership with Ministry of Defence. The British population of grey seals is of great international importance and we are fortunate to have a thriving colony on the Lincolnshire coast.

Britain has about 40% of the world population of grey seals. Every November and December, the seals give birth to their pups near the sand dunes: a wildlife spectacle which attracts 60,000 visitors from across the UK and Europe. The contribution to the local economy is estimated at £1m annually. Local schools bring 1,300 pupils on educational visits each year.

Adjacent to Donna Nook is RSPB's Tetney Marshes Reserve covering over 1,500 ha of mudflat, saltmarsh, dunes and lagoons between Cleethorpes and Donna Nook which support up to 50,000 wintering and passage waterbirds with the saltmarsh holding important populations of breeding birds. The lagoon habitats support the rare lagoon sand shrimp, which occurs here at its northernmost site in the UK.

As a result of this ecological interest, coupled with the site's size

and remoteness, Tetney Marshes is not currently capable of accommodating lots of visitors. Inland of the seawall from Tetney Marshes, there are extensive areas of agricultural land, which also support significant numbers of wintering birds alongside an existing network of public rights of way that provide a certain level of public access.

If sensitively developed the area could support an enhanced ecotourism and nature watching experience. This would build on the existing high tourism profile of Cleethorpes, spreading economic benefits through the year and to local communities in a manner sensitive to the areas' rural nature. This would involve raising the profile of the area's wildlife while putting in place the necessary infrastructure to both manage the existing pressures facing the area and provide new opportunities for wildlife and people.



Grey seal pup - Adrian and Hilary Middleton

4.4 Investing in natural capital alongside access and soft transport

The Humber has a number of long-distance walking and cycling routes – the Wolds Way, the Transpennine Trail, the Viking Way and the proposed Trent Valley Way. The planned England Coastal Path will become one of the world's longest walking routes. Sections of the route that are already in place demonstrate clear economic benefits. The south-west part of the path has been shown to generate £300 million per year to the south-west economy (about £470k per mile¹¹). The Wolds Way, though mainly used by local oneday walkers, already supports a visitor spend of about £100k - 400k along the route¹².

Likewise, there are clear benefits to local economies from walking and cycling for commuting, in terms of better health and reduced traffic congestion, yet commuting by car



has increased in the four Humber authorities since 2001¹³. There are many templates available to develop well-designed and effective walking/cycling routes, integrating the routes together and promoting their use. This potential to improve access and encourage more people to explore the Humber must be balanced by the need to

ensure that by increasing the level of access and use in quieter areas we are not damaging the wildlife that people are coming to enjoy. With this in mind Humber Nature Partnership is working with relevant organisations to help produce recreation management plans for the most sensitive areas.



Lapwings at sunrise

⁹Ramblers Association. Economic benefits of walking 2015.

¹⁰Provisional results, 2014/15 National Trails Visitor Survey. Unpublished Natural England Communication.

¹¹www.ctc.org.uk. "What's happened to cycle commuting in England and Wales" by Chris Peck, 7th March 2013. Article uses mapped UK census table changes between 2001 to 2011.

5. About Humber Nature Partnership

The Humber Nature Partnership is one of England's Local Nature Partnerships, endorsed by Government, to work with decision-making bodies and individuals to protect and enhance the natural capital of the Humber to enable prosperity. Humber Nature Partnership is a not-for-profit limited company, governed by directors from business and the public and voluntary sectors.

The Humber Nature Partnership works with its members to help them to achieve their economic aspirations in a sustainable manner and manages the Humber Management Scheme and the Humber Catchment Partnership.

Our vision is that by 2020 the Humber Estuary's natural environment will be richer in ecological diversity and more able to adapt to the pressures placed upon it than it is today, bringing benefits for wildlife, business and local people.

By working alongside the Humber Local Enterprise Partnership (LEP), the partnership wants to maximise the economic potential of the Humber's unique natural assets through concerted effort and a partnership approach to sustainable development.

Humber Management Scheme

The Humber Management Scheme is delivered through the Humber Nature Partnership and was established under the Habitats Regulations to assist those

organisations with statutory duties in working together to deliver the management of the Humber Estuary European Marine Site through one single management plan. It is a simple and efficient way to deliver the management of a complex estuary.

The action plan focuses on actions that will bring the greatest improvement in the Estuary.

Its objectives are:

- To manage the estuary to meet the requirements of the conservation objectives
- To bring people and organisations together to deliver the sustainable management of the Humber Estuary European Marine Site.
- To raise awareness and educate stakeholders about the Humber Estuary European Marine Site and increase participation in its management.
- To identify information gaps and research requirements and to promote sharing and availability of data for the management of the Humber Estuary European Marine Site.
- To ensure a coordinated approach to the management of the estuary and its hinterlands including planning for the future in respect to the features of the Humber Estuary European Site.

Humber Catchment Partnership

The Humber Nature Partnership fulfils the role of a Catchment Partnership under the Catchment Based Approach to the delivery of the Water Framework Directive (WFD). At the catchment level, the partnership works with key stakeholders to agree and deliver the strategic priorities for the catchment and to support the Environment Agency in ensuring that the Humber reaches Good Ecological Status as required under WFD.



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