



# Dorset's Environmental Economy

A report for



and



November 2015

This proposal has been prepared by:



In association with:



for:

Dorset County Council

Dorset Area of Outstanding Natural Beauty

Jurassic Coast World Heritage Site

and the Dorset Local Nature Partnership

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## Dorset's Environmental Economy

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# INTRODUCTION

Ash Futures have been commissioned to produce a report on the Dorset Environmental Economy for Dorset County Council and its partners, including specific economic impact studies of the Dorset and East Devon Coast World Heritage Site (the Jurassic Coast) and the Dorset Area of Outstanding Natural Beauty.

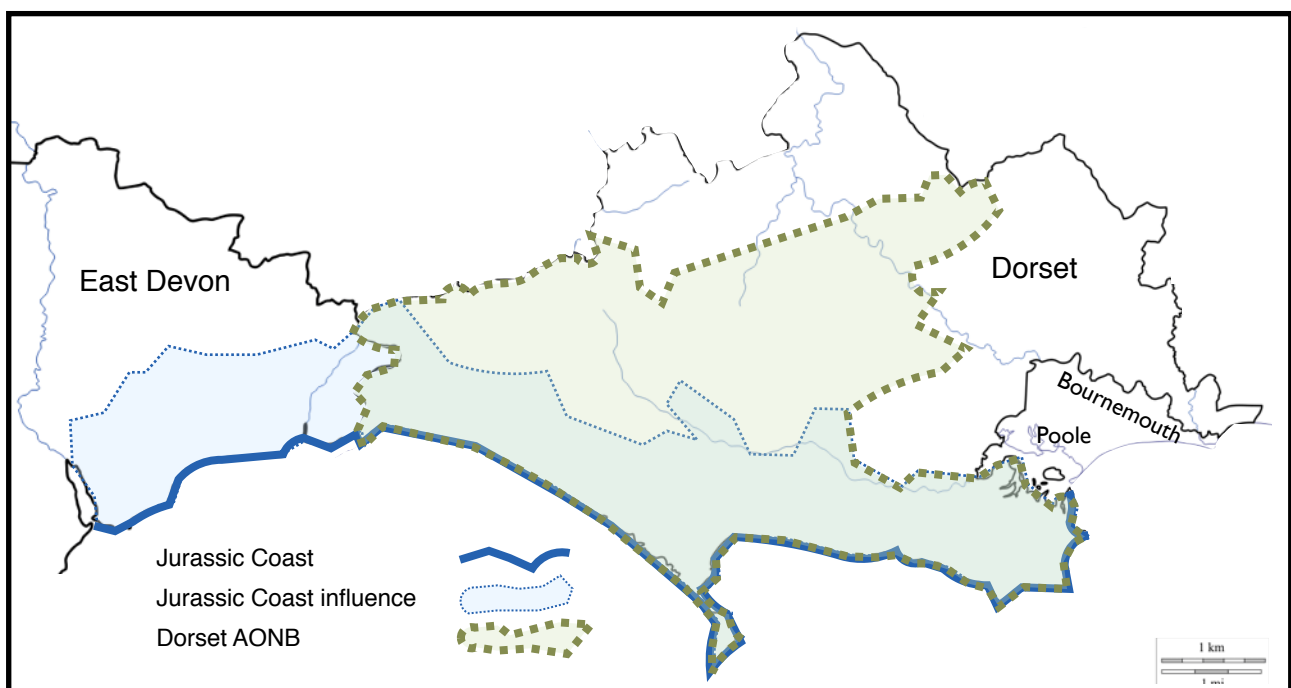
The five aims of the study are as follows:

- To define and describe Dorset's 'Environmental Economy' as a whole;
- To scale and scope Dorset's 'Environmental Economy' by a range of economic metrics;
- To assess the value of the Dorset and East Devon Coast World Heritage Site (Jurassic Coast) and the Dorset Area of Outstanding Natural Beauty;
- To describe the growth potential of Dorset's 'Environmental Economy' outlining strengths, weaknesses, opportunities and threats (SWOT); and
- To make recommendations on how Dorset can sustainably exploit its natural assets.

This has been a fascinating, and challenging, brief. The brief effectively asks for three very different products within the single commission: valuing the Dorset's environmental economy; two detailed impact assessments; and a more discursive piece about utilising the natural assets to support the development of enterprise and the economy. As such both the style and substance of these sections of the report are different, but are brought together in one report.

Ash Futures have addressed the first two of the five aims by considering the theoretical and applied aspects of the Dorset economy, environmental accounting and environmental economics; depicting Dorset's particular environmental assets and flows; and assessing a valuation of the environmental economy through four mechanisms. These mechanisms are a 'top down' proportionate approach for narrowly defined environmental goods and services, a 'bottom up' sector approach to economic flows, an asset-driven model based on wider environmental economic characteristics and a broad employment approach to 'green' jobs. We reference these accounting, sector and value frameworks against other studies for equivalent areas within the United Kingdom and internationally.

*Schematic map of Dorset, the Dorset AONB and the Jurassic Coast*



Based partly on a series of user and business surveys and partly on suitably interpreted sector/employment benchmarks the third study aim above is covered by two reports. The client requires these reports to 'stand alone' as separate pieces of research but they are intellectually consistent and analytically integrated with all the rest of the work. This mutual reinforcement between the macro and micro assessment of value is supported by the findings of an on-line residents' survey and enhanced by a number of short case studies explaining how real businesses value Dorset's environmental economy and its environmental designations.

Next, a SWOT analysis of the Dorset environmental economy is presented to build a foundation for outlining growth potential. It highlights the tension between 'traditional' short-termist practice with respect to the political economy of development and the significant potential for the environment to build capacity, pursue dynamic innovation and generate real value.

From this basis, monetisation of environmental economic factors and consideration of potential 'futures' and local interventions are reviewed. A wide range, from positive aspects of technological and network change to negative aspects of climate change and land use, are considered. The report reviews what can be controversial approaches to paying for environmental access, for natural benefits, and for eco-system services.

Within the limited scale of the commission, the research has covered a wide range of secondary and a few primary sources and provided an array of analytical findings and developments. The result is a large and complex study that requires careful reading and interpretation. Nonetheless, its results are clear and can be quickly summarised.

In brief, the environmental economy is a vital, important, indeed indispensable, part of economic, cultural and social life in Dorset. It contributes a significant amount to annual output and employment and the preservation of its productive capacity is key to future living standards and wellbeing. At every stage, planning and policy towards economic development needs to consider environmental assets and service flows as a central part of setting priorities and delivering investment.

The assessments and conclusions provided in this study of the Environmental Economy form a solid foundation for Dorset County Council and its stakeholders to influence and direct future development priorities across Dorset. Hopefully, it will remain highly relevant to the process of sustainable and sustained growth and development for years to come.

Ash Futures  
November 2015

# EXECUTIVE SUMMARY

Dorset's special environment, as we all know instinctively, is crucial to our well being - in every sense. As a society, we depend on the food, fuel, fibres and medicines that the environment provides, just as we depend totally on the clean air and water, the soils and flood alleviation that nature offers us. It is no different for the economy. Without a healthy, diverse, efficiently functioning natural environment, we would not have a functioning economy.

Yet we often treat the environment as if it is a subset of our economy, something to be exploited, traded and sometimes ignored, in the pursuit of growth and profit. Governments<sup>1</sup>, businesses and citizens are increasingly recognising that many important parts of the ecosystem on which we depend have reached their limits of their capacity.

Our report acknowledges the vital role played by the natural environment, in general and in Dorset. Nevertheless, we have been asked to demonstrate the economic value of Dorset's environment and to consider how the environmental assets might be exploited in a sustainable way to create more economic returns - both for the local economy and to be spent maintaining those assets into the future.

## The value of Dorset's environmental economy

This report uses four different approaches to describing and defining Dorset's Environmental Economy:

**Environmental Goods and Services (EGSS) ratios:** calculating Dorset's 'share' of the UK national environmental accounts, and using various definitions of environmental goods and services (EGSS), yields 'top down' annual GVA and employment figures for Dorset's environmental economy of about £0.25-0.9 bn (2013 prices) and 3,900-16,750 jobs (FTE) respectively

**Sector flows:** building 'bottom up' from a Standard Industrial Classification sector approach, and taking into account aspects of direct and indirect impact, estimates of £1.3-1.5 bn GVA and 25-35,000 jobs respectively are derived

**Green economy:** using a broader definition of the 'green economy' based on employment and/or occupational characteristics, the aggregate figures increase to about £2.5bn GVA and 61,000 jobs respectively

**Asset flows:** using Dorset's natural capital asset base and incorporating aspects of environmental flows not included in 'traditional' economic accounts (such as pollination services), environmental services have a value of up to £4.5bn per year (or £1.8bn GVA p.a. if the value of carbon sequestration is deducted, which is recommended given the uncertainties about this element of valuation)

At a headline level, Dorset's Environmental Economy is worth between £0.9 billion and £2.5 billion per annum; and supports between 17,000 and 61,000 jobs in the economy. Dorset's Environmental Economy is thus worth between 5% and 15% of Dorset's overall economy each year, depending on the methodology used. **If we take a central estimate of approximately £1.5 billion per annum, and 30,000 jobs, Dorset's Environmental Economy is worth about 8%-10% of Dorset's overall economy each year.**

We also point out that:

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<sup>1</sup> The Natural Choice: securing the value of nature. DEFRA, 2011



- environmental assets are likely to become more valuable over time, in absolute and relative terms, in response to rising relative scarcity and increased amenity and use values.
- the environmental economy may tend to grow faster than the overall average in future
- as pressures on Dorset's environmental assets increase, so the value per unit of those assets may increase
- as technologies, demographics and processes change, the potential contribution of the environment to Dorset's economy will tend to grow, as the threats to its preservation rise.

Backing up the overall assessment of Dorset's Environmental Economy, we have looked at how Dorset residents value the environment. There are very clear findings that:

- they make use of the natural environment frequently
- the natural environment is one of the main reasons for living in Dorset
- They recognise that there is a price to be paid for maintaining the coast and countryside, and there is a willingness to pay for it directly and indirectly
- residents probably over-estimate the proportion of local taxation which is devoted to its upkeep'
- they think there is a significant price premium on their homes

**We have shown that residents place a significant value on being able to access and enjoy the Dorset environment.**

### **The economic impact of the two key environmental designations**

As part of the overall study, we have provided a more detailed look at the economic value of the Jurassic Coast World Heritage Site and the Dorset Area of Outstanding Natural Beauty (AONB).

The value of the environmental economy within the Dorset AONB area is £183 million to £189 million per year; and **the influence of the Dorset AONB designation on that economic output is estimated to be circa £65 million per year and helps support up to 1,200 jobs within the area.** The value of the environmental economy within agreed the Jurassic Coast area is between £299 million and £352 million per year; and **the influence of the WHS designation is estimated to be circa £111 million per year and helps support up to 2,000 jobs in the area.**<sup>2</sup>

While we can not attribute these estimates to the designations specifically, it is highly likely that their existence has increased the scale of benefits to the area significantly. Three different surveys highlighted the high level of brand recognition and the positive view of the impact of the AONB and WHS designations held by visitors, businesses and residents. It is clear that the AONB and the WHS partnerships play an important role in developing the economic value of the environment and help to leverage extra funding into their areas.

### **The Future of Dorset's environmental economy**

A look at the future risks and opportunities has highlighted the potential for Dorset's natural environment to continue to be an important economic and social asset and a driver for economic development. However, this will only happen if its intrinsic value of properly understood and its economic value is full costed and internalised into the economic accounts of the area.

Finally, we examined the potential for the environmental assets to be sustainably exploited and for more of the 'value' to be captured for reinvestment into the preservation of those assets and recycled into the local economy.

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<sup>2</sup> However, because the two designated areas overlap for a large part of Dorset, it is difficult to separate the impact and, as such, the estimates of impact should not be added together.



We offer ideas to maximise income from:

- paying for access to particular sites
- paying for ecosystem services
- paying to access the benefits of nature
- ways to increase financial support from the public
- ways to maximise income from the public sector
- ways to create and improve markets for 'green' goods and services

We conclude by suggesting that, in order to deliver the potential economic value, there will need to be a significant programme to raise awareness about the intrinsic and economic value that Dorset derives from nature. Businesses, public bodies, individuals and community groups need to appreciate that there is a cost to maintaining the environmental assets that they value highly but which have often been seen as 'free'. That cost has to be met.

**This report demonstrates that Dorset's natural environment is of great value, not least to the economy. If Dorset's environment is to continue to provide the wide range of benefits to both local communities and the local economy, it will need continued support to do so. It makes economic sense to invest in this important sector and the natural infrastructure so that these assets will continue to provide dividends into the future.**

# 1 DEFINITIONS AND VALUATIONS

## Summary

The economy and the environment are closely interrelated. Natural capital assets are the foundation of all wealth, consumption and production. Materials and energy flows from and to the environment are vital elements of the economic process on both the demand and supply sides of the market. They underpin the process of employment and productivity that drives growth and living standards, and, thereby, they promote wider wellbeing.

Ultimately, the interaction of all environmental substances, from extraction and capture, through production and transformation, to ultimate disposal, enhance or detract from the natural asset stock and its capacity to provide a flow of useful value in the future. In describing and defining Dorset's Environmental Economy, this understanding is vital. It informs the methodologies and sources used, supports the analytical calculations made, and frames the conclusions reached.

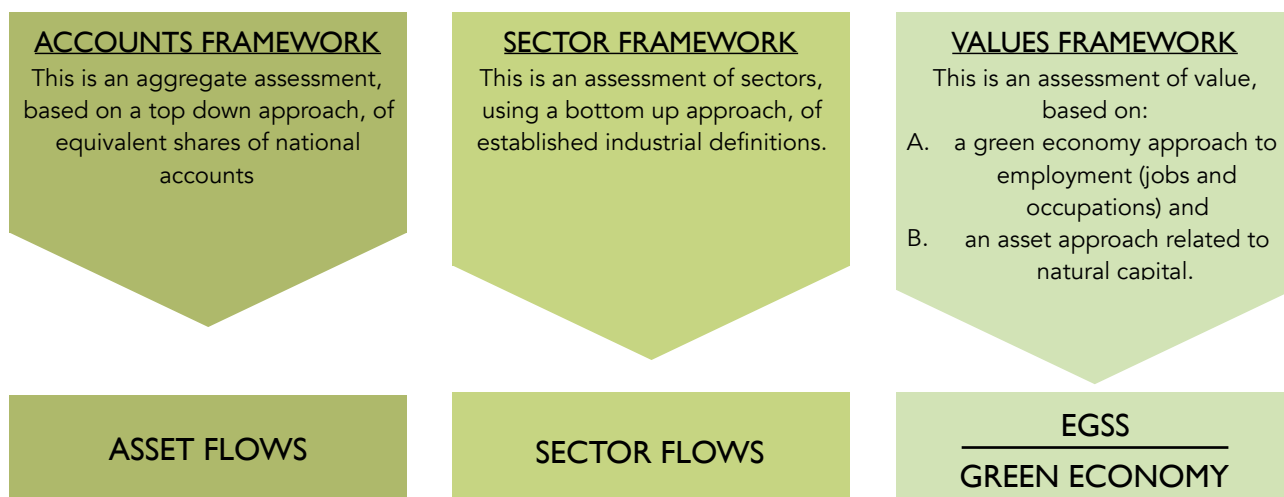
**The main conclusion is that environment is a very important part of Dorset's economic life, supporting significant business and household activity, adding output and amenity value, creating employment, and supporting incomes and profitability. Conservation of the natural capital base and the flow of environmental services from that base is an important ingredient in the sustainable and sustained potential for local economic development.**

Dorset has its own special and distinct environmental and economic characteristics. A detailed assessment of these elements, from lowland heaths and dramatic coasts to productive land and favoured living conditions, is beyond the scope of this report. The dynamic complexity of Dorset's environmental assets and the services they provide for the economy are profound.

For current purposes, however, we concentrate on a macro view of the environmental economy. At this level, the unique characteristics of the Dorset special environment are incorporated in broad metrics that allow comparison with previous studies in other similar areas. In this section of the report, when commenting on the economy of Dorset, we include Bournemouth and Poole.

## Our findings

This report uses four different approaches to describing and defining Dorset's Environmental Economy. This enables some triangulation of results, promotes a thorough understanding of the 'real world' complexities, encourages a more objective discussion, interpretation and use of those complexities, and supports cross-comparison with previous studies.

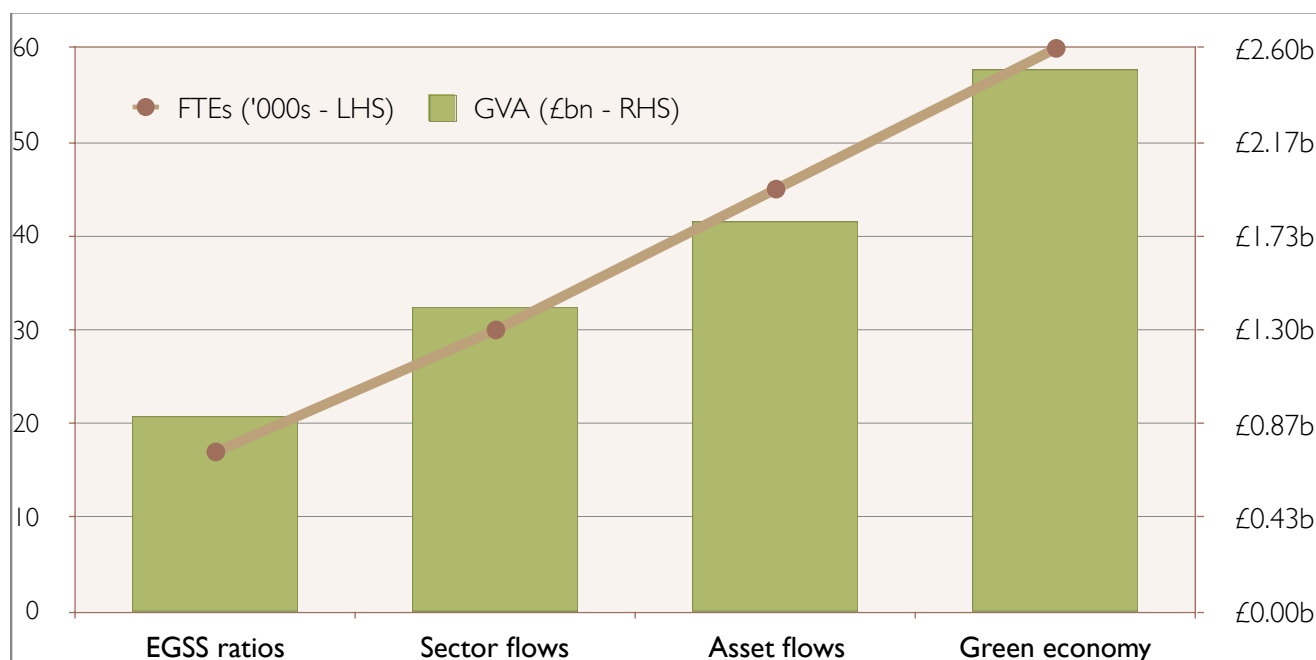


There are two approaches under the values framework because there are two main environmental asset classes in any economy: human and natural capital.

These three 'frameworks' lead to the the four approaches whose findings are summarised here. They are explained in more detail In Annex 3.

1. **Environmental Goods and Services (EGSS) ratios.** Dorset represents about 1.0-1.2% of the United Kingdom with respect to population, land area and output (gross value added - GVA). Comparing these with a) the UK national environmental accounts and b) a 'narrow' definition of environmental goods and services (EGSS), yields 'top down' annual GVA and FTE employment figures for the Dorset environmental economy of about £0.25bn (2013 prices) and 3,900 respectively<sup>3</sup>. Using an alternative, wider EGSS definition/ratio of environmental industries and services, these figures rise to £0.9bn and 16,750 respectively.
2. **Sector Flows.** Based on a standard industrial classification (SIC) sector approach, building 'bottom up' and taking into account aspects of direct and indirect impact, estimates of £1.3-1.5bn GVA and 25-35,000 FTEs respectively are derived.
3. **Green economy.** On a broader definition of the 'green economy' based on employment and/or occupational characteristics, considering aspects of all jobs and activities that might have a content that promote environmental sustainability, the aggregate figures increase to about £2.5bn GVA and 61,000 FTEs respectively.
4. **Asset flows.** Approaching the matter from the natural capital asset base and incorporating aspects of environmental flows not often included in 'traditional' statistical economic accounts, (such as pollination services), a total for environmental services with a value of up to £4.5bn per year is calculated. For most purposes, and to allow easier comparison with other economic statistics, the large element of these figures estimated for carbon sequestration is deducted<sup>4</sup>, yielding £1.8bn GVA per annum.

#### Estimated Contribution to Dorset's GVA (£bn) and FTEs ('000s)



Source: Strategic Economics

<sup>3</sup> In this summary, given the approximations, judgement and assumptions involved in these calculations, we make appropriate rounding to all estimates. The narrow and broad definitions reflect how certain key sectors, such as the visitor economy and aspects of different supply chains, are assessed.

<sup>4</sup> Taking out carbon sequestration is not about measurement of value, it is about distortion of the comparative case. Because it is a such a large element of the asset approach and the methodology used is robust but less well known, sequestration distorts the total value in comparison with the other methods.

Users of this report will decide which definition and scale of environmental economy is appropriate for different assessment, communications and decision-making circumstances. For many purposes, it is not advisable to confine discussion to one figure but rather to acknowledge the range that fully explores the story of environmental importance and impact. Hence, the summary range, pictured in the chart above, is crucial, recognising that each of these estimates contains an element of risk and uncertainty and, in sum, they reflect a range of probabilities that cannot sum to one.

Whilst it is not recommended, some readers may want headline, single figures. Fully recognising the many caveats with such simplification, **the central estimate is that the natural environment contributes, on a comparable basis with many other economic statistics, about a £1.5bn of GVA per annum and supports about 30,000 jobs in the total Dorset economy. The Dorset Environmental Economy constitutes, in broad terms, about 8-10% of total annual economic output and employment, as conventionally measured.**

Around this central view, the full range of possible values is very broad, from £250mn to £4,500mn per annum. It is important to remember that these are based on different methods, prices, time periods and definitions. In any real case, the values used need to be appropriate for the particular discussion, decision-making arena and audience.

The range of possible valuations is inherently complex and can seem potentially confusing. Nevertheless, the main conclusion is clear: **under all approaches the net local benefit of Dorset's Environmental Economy is significant, substantial and profound.**

Specific context may be important to individual development debates, **but the environmental economy is crucial to the local economic development process and how this supports and relates to personal and community well being and business competitiveness and growth.**

The aggregate economic measures of output and employment derived here are broadly in line with previous assessments for other UK areas with comparably high quality environments. They constitute a sound foundation for a range of further analyses, including various futures scenarios or economic forecasts for strategic and policy planning, as well as decision-making about design, delivery, assessment and evaluation.

Across the full range from the Dorset Local Enterprise and Local Nature Partnerships, private companies and business organisations, the conservation agencies, and local authorities, the Dorset development community should bear all these environmental economic parameters in mind. Arguably, when deciding local interventions to promote growth in Dorset, the impact on the environment and its continuing ability to sustain future service flows for business and living standards should always be a vital ingredient.

If development is to support optimal sustainable development<sup>5</sup> – (maximum economic growth at minimum environmental cost whilst preserving the sustainable contribution of natural capital to the economy's structures, trends and outcomes) – it should include the conservation of natural assets and flows and the preservation of those environmental aspects of Dorset that make it a special place for investors and businesses, and for residents and visitors.

*A more detailed description and analysis of Dorset's Environmental Economy can be found in Annex 3*

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<sup>5</sup> This is an economic definition of sustainable development which enables us to frame our analysis in reaching an economic valuation for this report. More generally, the Brundtland definition is accepted.

## Descriptive Introduction

The Dorset environment is diverse, with some special characteristics that are reflected in its economic value and the risks associated with incompatible development.

In terms of **natural assets**, Dorset has a range of landscapes, seascapes, habitats and sites that act as “capital” for economic and social activity. These assets provide a stream of vital services, ranging from direct extraction, through pollination for agriculture and horticulture, to health and wellbeing for residential and external visitors.

These natural assets are exemplified by the 140,500 hectares in the Areas of Outstanding Natural Beauty (AONB)<sup>6</sup> and include chalk down-lands, valleys and ridges; clay and other pastures and woodland; lowland heaths; limestone plateaus and river valleys; and coastal harbours, beaches, cliffs and lagoons and the surrounding seas themselves. Although the AONBs cover just part of Dorset, they illustrate the diversity of its natural assets very well.

In terms of designations<sup>7</sup>, there are four Ramsar sites, 20 Special Areas of Conservation, 11 National Nature Reserves, 141 Sites of Special Scientific Interest, 45 Local Nature Reserves and 1,254 Sites of Nature Conservation interest. These cover about 12% of the land area. Dorset's nationally important landscapes are recognised in two Areas of Outstanding Natural Beauty, the Dorset AONB and the Cranborne Chase AONB, which together cover over 50% of the Dorset County area. Also, there is the World Heritage Site – the Jurassic Coast, the wider marine environment and a raft of historic, cultural and built environments (over 12,000 heritage sites defined by English Heritage) that offer asset value to local and wider communities. The County is an important wildlife haven (with 85% of British mammal species represented, 90% of breeding birds, 80% of dragonflies and all native reptiles/amphibians). It is an important location for breeding, over-wintering and migrating birds, providing a vital link in annual bird migration locally, nationally and along the broader Arctic-Africa ‘flyway’.

The “Jurassic Coast”<sup>8</sup> is England's first and only Natural World Heritage Site and is designated for its outstanding Earth Science value, put simply, its rocks, fossils and landforms. It comprises a 95-mile stretch of coast from Exmouth (East Devon) to Studland (Purbeck, Dorset), with about 71

### Case study: AJAR OF

Tracey Collins moved to Dorset, three and half years ago and set up her preserve making business in Droop, near Sturminster Newton. It's a small, but growing business that employs one member of staff apart from Tracey herself and turns over about £30,000 a year. **Ajar Of** make jams, marmalades, chutneys and sauces of every flavour you can imagine, and some you can't!



Her arrival coincided with the relaunch of Dorset Food & Drink, by Dorset AONB - and Tracey came across DFD at the County Show that year. Being member has helped Tracey become more aware of the other food producers around her and how she can run her business more sustainably. Using local produce is important to **Ajar Of**, so Tracey was delighted to find a local blueberry grower from Puddletown, rather than having to import frozen product. “And the quality is superb” she added.

The Dorset Food & Drink Team have become more and more useful as Tracey realised that she needed to be more proactive with them - sharing her ideas and aims. In return, she has found them to be enthusiastic and supportive, with great social media and great events.

“it's got to be a two-way relationship to work, but they have helped me make all sorts of links and contacts. It's like having a mentor”

<sup>6</sup> Dorset AONB: A Framework for the future 2014-19, 2014 and Cranbourne Chase AONB Management Plan 2014-19

<sup>7</sup> Designated Landscapes of Dorset, Dorset County Council

<sup>8</sup> Jurassic Coast – Interpretation Action Plan (2005)

miles in Dorset itself, which aims to “inspire people to celebrate and enjoy” the environment. As with all World Heritage Sites, it is focussed on the conservation and sustainability of something of global value, as designated by UNESCO. It aims to support natural characteristics and systems and regenerate local communities - using education, transport and communications, marketing and branding to share knowledge and encourage engagement, without sacrificing environmental asset values.

In terms of **environmental services**, Dorset provides marine, riverine, land use and other aspects of natural service flows to residents, visitors and businesses. There is a range of water, land and sky facilities for amenity value of many types - leisure, recreation, education, culture and economic drivers are all at work. There are also services in terms of flood defence, crop pollination, carbon sequestration and pollutant mitigation. Moreover, there are more market-orientated natural resource flows, including fuels (oil), timber, marine produce, and minerals. Some of these are renewable (e.g. agriculture), requiring careful management to maintain productivity over time. Some are non-renewable, requiring careful management to maintain optimal depletion rates that maximise returns at minimum cost (including non-market costs) over time.

In terms of **sector value**, Dorset offers environmental value through tourism and leisure, agriculture and other ‘land’ based industries, some engineering, property and other services and utilities. Farming, for example, covers 77% of the AONB land area and woodland 11%. Fishing covers a large number of ports and harbours from Christchurch to Lyme Regis. Dorset has a positive reputation for food products and services nationally and internationally which stretches into food manufacturing, processing and distribution. Dorset provides a positive place to live, develop businesses and attract skilled labour.

The Dorset Local Nature Partnership (DLNP) and the Dorset Local Enterprise Partnership (DLEP) both recognise the value of nature in Dorset.<sup>9</sup> The DLNP identifies protected sites as “Crown Jewels” of asset value and describes the key habitats and species, environmental goods and services (EGSS), and a range of social values generated by the environment. The LEP<sup>10</sup> has positioned Dorset as ‘the natural place to do business’ and suggests, on a very narrow definition, that EGSS add £173mn of GVA and 3,500 FTE jobs to the economy. The analysis in our report finds that these figures underestimate the importance of the environment to Dorset’s economy. According to Visit Dorset, the Dorset tourism sector, alone, has been estimated to add value worth £1.7bn and 14% of jobs per annum (2013 prices)<sup>11</sup>.

Dorset’s land use has changed significantly over time and there is pressure for it to continue to do so. The irony is that as environmental capital grows scarce, its economic value per unit will increase yet there may be not enough units left for it to remain viable without careful measurement, management and full appreciation<sup>12</sup>.

Having appreciated the depth and breadth of the environmental economy in descriptive terms, three frameworks for assessing the value of the Dorset Environmental Economy are considered. These complementary ways of looking at the valuation issue yield the four summary estimates of monetary and employment value.

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<sup>9</sup> *Natural Value – the State of Dorset’s Environment DLNP (2014)*

<sup>10</sup> *Transforming Dorset: Strategic Economic Plan. Dorset LEP, 2014*

<sup>11</sup> *The Economic Impact of Dorset’s Visitor Economy 2013. Dorset County and District Councils, 2014*

<sup>12</sup> *See example box above – thanks to Dorset Wildlife Trust*



**To give just two examples of how more sustainable environmental management can encourage more sustained economic returns:**

The current Common Fisheries Regime within the European Union has tended to involve massive financial subsidies that sub-optimally encourage over-capacity and over-entry into particular fishery areas, including off the Dorset and Devon coasts. The central European system has not corrected an inherent, narrow market bias towards short-term extraction at the cost of long-term viability. Catches have tended to exceed both the economically (maximising value of return over time) and environmentally (optimising resource stability and depletion) efficient rates of extraction. Recently and locally, better results have been obtained by more effective intervention. For example, the creation of a Marine Protected Area (MPA) in Lyme Bay, banned bottom trawling in a set area. Contrary to some prior belief, this increased catches for local fishermen and benefited the sustainability of the shellfishery. Investing in protection of the natural resource base has built a better environmental economy and a better balance of monetary returns for today and tomorrow.

Elsewhere, the re-profiling and re-wilding of Dorset's rivers and investment in catchment management offers the prospect of better use and non-use values in the environmental economy. For example, by restoring rivers from straight, rigid channels to more meandering, species-rich, vegetated catchments, they become a valuable resource again that can generate and save money. The financial generation can include improved angling fisheries, increased land price, and higher value visitor and resident amenities. The cost savings can be substantial, stemming from better flood management (rivers flood away from residential or industrial areas), reduced bank and soil erosion, lower run-off of expensive agricultural fertilisers, and increased potential for nutrient cleansing.

## **An Accounts Framework**

Using an 'accounts' framework, Dorset offers a range of ecosystem assets and services that have direct and indirect effects on economic 'success', now and over time. These reflect provisioning, regulating, and supporting functions as well as cultural elements to do with positive direct inputs, mitigation of pollution/damage, restoration of amenity value and reducing degradation. Importantly, an understanding of these contributions enables the real trade-offs and impacts of economic development to be assessed more comprehensively. First, then, we consider the asset base for the environmental economy.

The authors have seen an, as yet, unpublished study by AECOM Ltd for Defra providing an "experimental ecosystem account for the Dorset AONB". It uses physical flows of crops, water, energy, air, recreation and other environmental elements and ascribes monetary values to these. In aggregate, it finds monetary flows of environmental services worth more than £62mn (£577 per hectare) in 2013, with one of the largest contributions coming from the 6.1 million visitors to ecosystems. We cannot quote or interrogate these figures in detail because there are a number of outstanding issues about their validity still to be addressed. Nevertheless, these broad aggregates indicate some initial scale of the asset flows involved for the AONB; and are consistent with our findings for that area, as developed later in this report.

We are also aware that researchers at Bournemouth University (BU) intend to assess the natural capital of Dorset in ecological and value terms as part of a wider modelling of the Dorset economy. Whilst any outputs from this work are unavailable for this commission, it should represent an important element for future assessment of the Dorset Environmental Economy, and the impact of future economic development.

A report has been written, however, by a BU student as an MSc thesis<sup>13</sup>, that makes a start to this end and usefully frames the question of natural capital and the service flow from those assets in Dorset. In summary, this thesis values ecosystems and environmental capital across a wide range of potential assets. It provides estimates that indicate a large and important environmental

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<sup>13</sup> *Valuing Ecosystem Services and Environmental Capital in Dorset UK; James Jackson, MSc thesis, Bournemouth University 2013. This was supervised by Professor Adrian Newton - and covers Dorset's environmental assets in detail.*



content in the local economy. The values seem to be significant enough to suggest the environment should be a driving factor for local government, firms and residents and should be factored into the panoply of decision-making on economic development by the LEP, the LNP and other 'development' stakeholders.

Based on the Total Economic Framework approach that estimates use and non-use values (as described later in Annex 3 of this report) for the Dorset area, including the AONB and the WHS, it considers low, average and high values for each category of assets flows. It forms its estimates on a myriad range of previous sources and techniques as appropriate for each element. This raises some issues about consistency to do with comparable pricing over time and the dangers of double counting. But, in aggregate, accepting the paucity of data in some areas, it concludes that it is more likely to under-estimate than over-estimate the scale of the environmental economy.

The table below summarises only the mean values for the services defined. It does not show the full range of possible valuations considered in the thesis. Given the nature of the categories used and the definitions assumed, aggregation is difficult because of differences in form and monetary content and because some of the definitions are debatable and potentially covering the same or similar flows. Careful interpretation is needed, therefore, especially with regard to services that are of a preventive/supportive and/or non-market kind in a traditional sense.

#### Environmental Services in Dorset (GVA)

Category	£mn	%	Category	£mn	%
Aesthetic, recreation, culture	88.0	2.0	Timber	1.3	0.03
Agriculture	155.1	3.5	Coastal and marine	7.1	0.2
Carbon Sequestration*	2639.8	59.3	Oil, gas and minerals	360.0	8.1
Pollination	1.2	0.03	Tourism	807.7	18.1
Regulation services^	161.6	3.6	EGSS employment	173.0	3.9
Flood defences	56.9	1.3	Total	4451.8	100

\* from woodland, farmland, heathland, green space and coastal areas.

Source: James Jackson op cit, BU 2013

^ from air quality, biochemical, water, erosion et al in various habitats.

For example, the market value of carbon sequestration is estimated to be huge, dominating all the other categories, but is extremely sensitive to the assumptions made. Also, in estimating net present values of the capital stock, the discount rate assumed is critical and can change the output figures enormously. Finally, there is always some interpretation needed in assessing 'motives' for tourism. In order to make the estimates relevant with the other approaches, we have *discounted* the sequestration and parts of the tourism elements in this asset-based report. This produces a summary figure of £1.8 billion, which is comparatively robust for applied use. Despite all these definitional caveats, this evidence gives us some useful benchmarks against which to set an assessment, tell an analytical story and gauge development impact. Moreover, it confirms that environmental assets "should be at the forefront of local government decisions and a driving factor behind the transition to a green economy".

Finally, the BU study attempts to turn these annual flows into a long-term net present value. It finds an average range of values from £55bn with an 8% discount rate over 100 years to £148bn at a rate of 3%. Because these values are very sensitive to the discount assumptions and judgements made, we would not quote them widely and, when they are used, they need cautious interpretation. Still, the potential capital value of environmental economic flows to Dorset is both large and significant.

## A Sector Framework

Using a “sector” framework, Dorset supports ‘green’ jobs and output in primary industries (largely agriculture, forestry, fishing and minerals), dependent industries (largely tourism and leisure services), contributing industries (the conservation sector) and environmental technologies (manufacturing and services). From this classification, and adopting a standard SIC approach to a definition of the environmental economy, a sector-based framework for description and valuation is adopted.

In Annex 3 of the report, the method of deriving values for a sector-driven “bottom-up” approach to the environmental economy is explained and used. There are number of caveats, analytical assumptions and judgements involved in deriving these figures. But, in summary terms, this approach calculates a Dorset Environmental Economy worth between £1bn (narrower definition) and £1.2bn (wider definition) per annum. The indirect and induced effects of that impact add another £0.3bn, yielding a base finding of £1.3-1.5bn of GVA per annum overall. The equivalent findings for total jobs are 25,000-35,000 (19,000-27,000 of which are directly supported).

Recognising differences of coverage, these numbers are in a similar area to the asset-based flows considered in the previous section and are broadly comparable with other geographical studies.

## A Value Framework

Using a “value” framework, (discussed in detail in Annex 3), Dorset’s environment adds value in direct and indirect terms, reflecting contributions to GVA and FTEs. In the broadest terms, previous studies have shown the real ‘green’ economy growing at 4-5% per annum (well above the underlying real GDP potential rate), contributing 16% of GVA and 20% of FTEs<sup>14</sup>. Narrower definitions of the environmental economy put these ratios at 6% and 5.5% respectively<sup>15</sup>. The ONS definition of EGSS<sup>16</sup> says output is worth 1.5% of GDP and a similar percentage of employment. Using these ranges and scaling for the local economy, the potential compass of Dorset’s Environmental Economy is summarised in the table below.

These calculated figures have been rounded conservatively to reflect the degree of approximation involved. According to the definition used, however, they indicate a significant Dorset Environmental Economy. In its broadest terms, the environment could be worth almost £2.5bn a year and could support 61,000 jobs. This would make it bigger than many sectors traditionally considered important parts of the local economy (e.g. about twice as many jobs as in manufacturing, recognising that there is some small overlap between the two). Even in the narrowest terms, these figures speak to the existing scale and development potential in EGSS.

### Approximate scale ranges for Dorset’s Environmental Economy

Definition	GVA (£mn)	Employment (‘000s)
EGSS	230	4.25
Wider Industries	925	16.75
Green Economy	2450	61.0

Source: Strategic Economics

<sup>14</sup> Devon’s Green Economy: Report on a Scoping and Baseline Study – Transform Research Consultancy for Devon County Council (2012)

<sup>15</sup> The Environmental Economy of the South East – Land Use Consultants et al (2002)

<sup>16</sup> UK EGSS 2010-2012 (ONS 15/04/2015)

Next, we consider whether Dorset's Environmental Economy has any particular characteristics that might push these numbers up or down. On balance, there seems no reason to make such adjustments: the scale indicated here is reasonable in a Dorset context.

- Given the standard, narrow definition of EGSS, in terms of environmental protection and management, and given the structural characteristics of Dorset's economy as a whole, it can be concluded that Dorset's EGSS is not sufficiently different from national averages to adjust the output or jobs estimates in the first line of the table above. **See also Annex 3.**
- Whilst there may be particular concentrations of certain activities that are different, in total terms, the wider industries definitions used in the second line above is unlikely to be significantly different between Dorset and comparable regions<sup>17</sup>.
- Dorset's Environmental Economy seems unlikely to be more extensive than that in Devon when defined as a full 'Green Economy', including aspects of occupations not normally associated with the environment but adding to environmental efficiency.

The valuations derived for Dorset's Environmental Economy reflect analysis at a point in time. They provide a base for future development and consideration. Accordingly, this descriptive and definitional section of the report closes with some thoughts on possible 'futures'.

- Environmental assets will become more valuable over time, in absolute and relative terms, in response to rising relative scarcity and, as real incomes rise, increased amenity and use values.
- Given trends in propensities to consume and value, the environmental economy will tend to grow faster than the overall average in the years ahead (perhaps averaging 3.5% per annum versus 2.5% per annum in real GVA terms).
- This higher growth potential reflects both a positive productivity effect and a positive employment effect – the former driven by investment, innovation and entrepreneurship and the latter by skills shortages, personal aspirations and monetisation of conservation and mitigation values.
- In turn, higher growth in environmental productivity and jobs will be a response to:
  - a) Increased supply through the more widespread use of better (environmentally beneficial) technologies, (including recycling and re-use of materials), supported by market and regulatory requirements, and
  - b) Increased demand from a growing, more affluent and more caring resident and visitor population, with a larger impetus to offset negative externalities, add recreational value and enhance overall community wellbeing.

The pressures on Dorset's environmental assets will increase. The value per unit of Dorset's environmental assets may increase even as the total available may be threatened. The economic opportunities for protecting assets and managing service flows to satisfy higher aspirations for a growing population will rise. As technologies, demographics and processes change, the potential contribution of the environment to Dorset's economy will tend to grow as the threats to its preservation rise.

Given this prognosis, it is incumbent on Dorset's economic development institutions to place environmental inputs, outputs and outcomes at the centre of strategy and planning for the economy in the decades ahead.

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<sup>17</sup> These include the South East, Devon, Scotland, the Cotswolds and, indeed, all UK regions

## 2 VALUATION - A MICRO PERSPECTIVE

Following on from the macro valuation of Dorset's Environmental Economy, we now consider micro values as revealed by a Dorset residents' survey. This survey focused on understanding the value that Dorset residents attach to the quality of the Dorset environment. In comparison to the estimates of economic value in the 'Descriptions and Values' section of this report, much of this 'expression of value' is not captured in any market transaction. We recognise that there is a widespread belief that environmental value cannot simply be captured through valuations by the market (which tends to reflect 'use' but not 'non-use' or amenity values). This part of the report aims to understand the intrinsic value that local people attach to the Dorset environment.

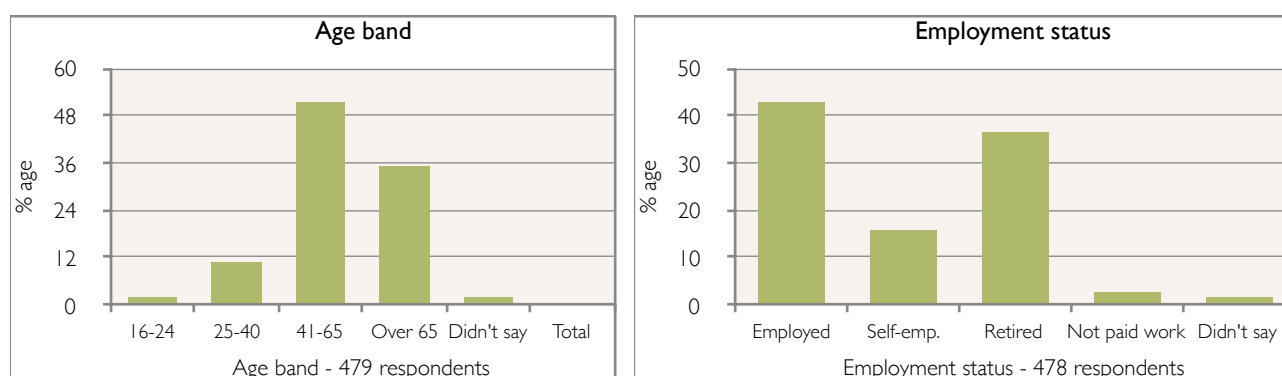
To understand this intrinsic value, we included questions in the residents' survey that looked at the issue in a number of different ways. Each of these attempt to place a monetary value on environmental quality. In many ways, less importance should be placed on these estimates in 'exact' terms; rather, more importance should be placed on the broad 'scale' of the valuation.

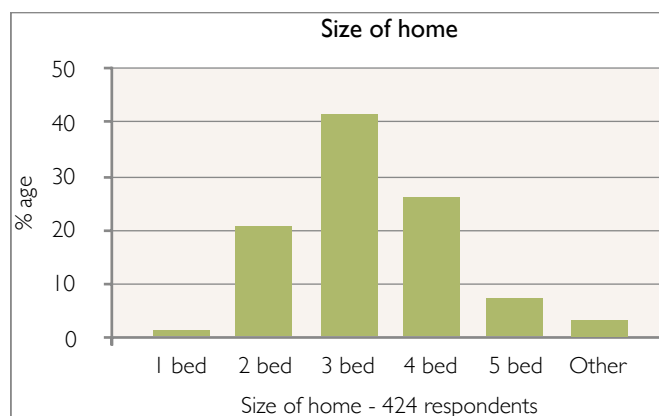
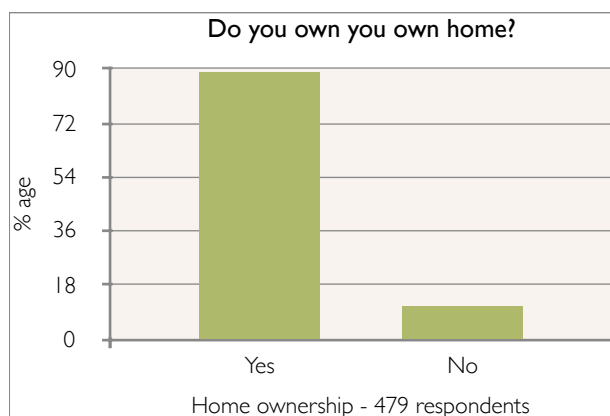
We have looked at the valuation using willingness-to-pay (WTP), revealed preference and (partially) hedonic pricing techniques. Each approach has its own methodological constraints but, by including these three techniques, we provide a layered approach. Given the limited extent of the brief, the overall approach is not one of the utmost scientific/academic rigour. Nonetheless, given the high numbers that responded to the resident survey, the results are statistically robust. Moreover, it does match techniques applied in similar applied studies, allowing us to focus on the scale of how much people value the environment rather than any exact measurement.

Analysis of the people who responded to the survey shows that they tended to be older, employed or retired, owned their own home and their homes tended to be relatively large. As such, it is important to be mindful of 'selection bias' when interpreting the results. In this instance, this bias could contain two elements:

- Firstly, those with a particular interest in the value of the Dorset environment may tend to have responded to the survey more than those with little, or no, interest. The aggregate value indicated may exceed the real view of the total population.
- Secondly, because the profile of those who responded is towards the older and wealthier end of the range, it may suggest an element of over-valuation.
- Neither of these two points, however, invalidate the survey as representing the real views of real people.

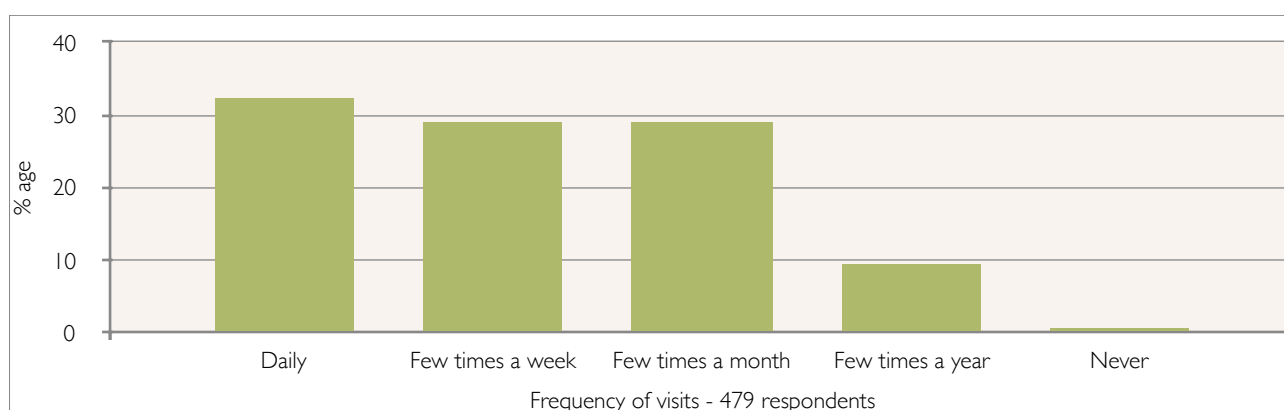
Profile of Dorset resident's survey





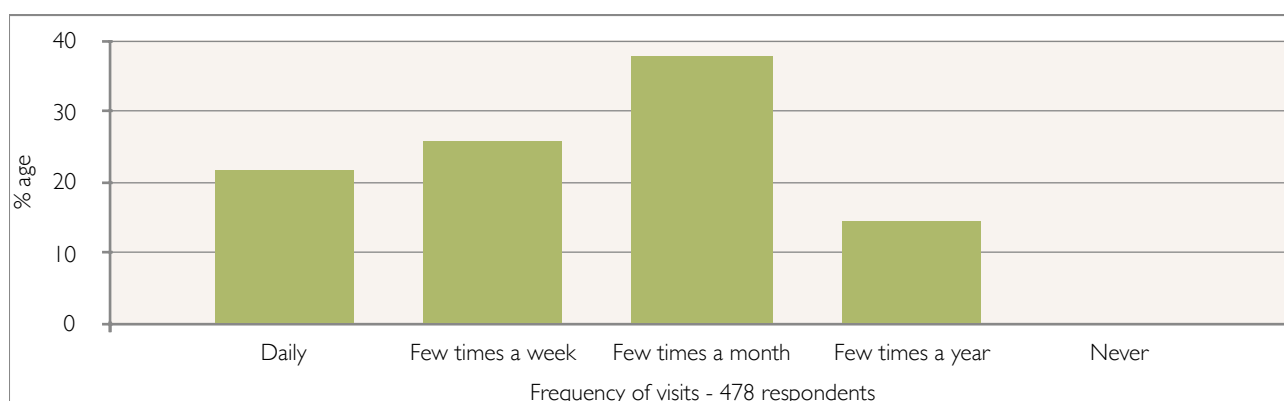
It is also clear from the residents' survey that use of the Dorset environment is extremely high. Many respondents experience it on a daily basis, with the majority accessing the countryside on a daily basis, or a few times a week.

### Frequency of visits to the countryside



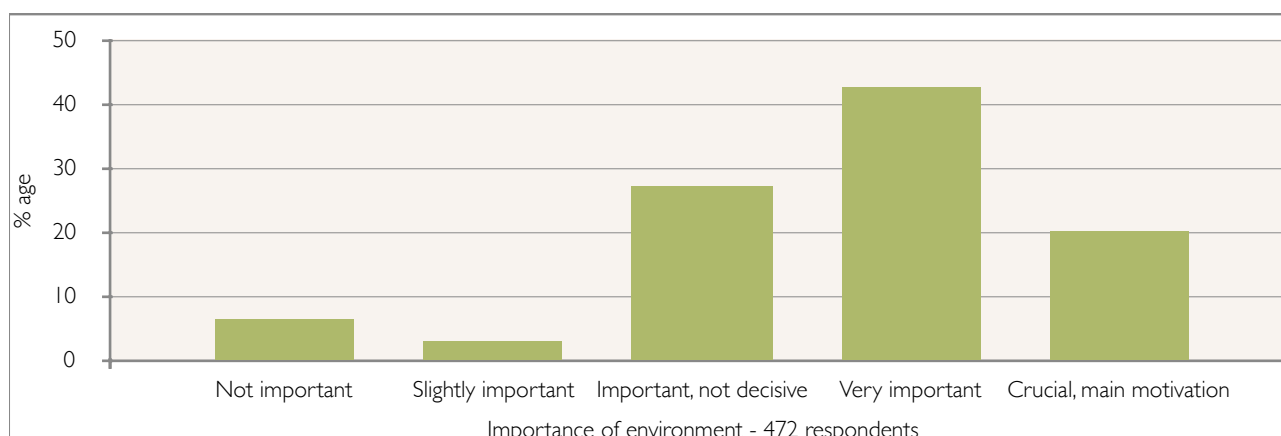
Visits to the coast are slightly less frequent, but the results show that use of these assets is still very high. We expect that differences between coastal and other sites are as much a reflection of where people who responded to the survey live (as shown by the map in the appendices), rather than any tangible differences in use.

### Frequency of visits to the coast



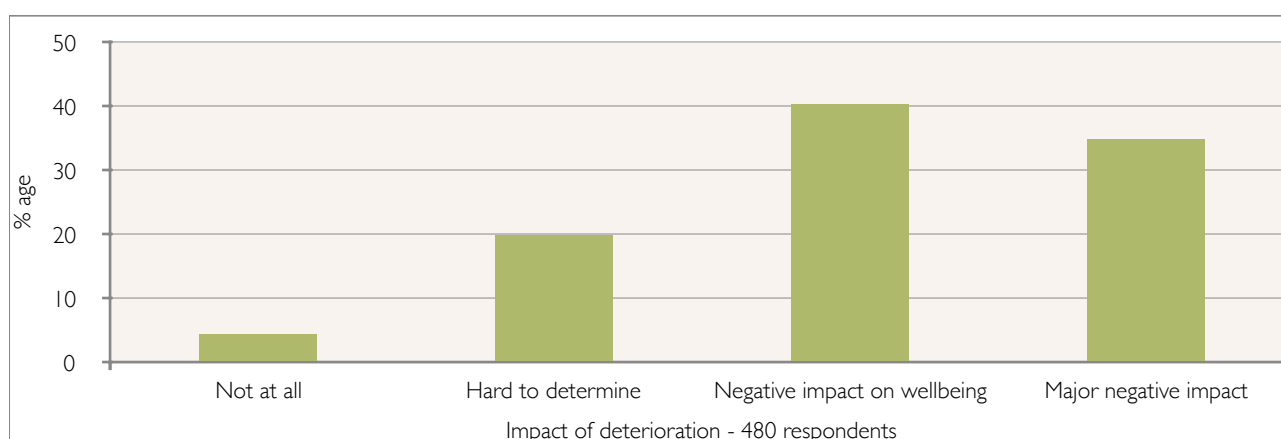
Residents were also asked about the importance of the environment on their decision to live in Dorset. The exact wording of the question was "When you made the decision to live in Dorset, how important was the quality of the environment?" The responses to the survey show that the Dorset environment is highly important to the majority of residents. 63% (298) of the respondents said that the environment was either 'very important' or 'crucial – the main motivation'.

### Importance of the environment for resident's choosing to live in Dorset



In a similar vein, we were also interested in understanding what impact may be felt if that environment – which is currently valued so highly – were to deteriorate. The chart below shows that the majority of residents feel that any deterioration in environmental quality would have a significant negative impact on their wellbeing. Very few (less than 5%) felt there would not be any negative impact on their wellbeing.

### Impact of deterioration of environment on quality of life



### Willingness-to-pay

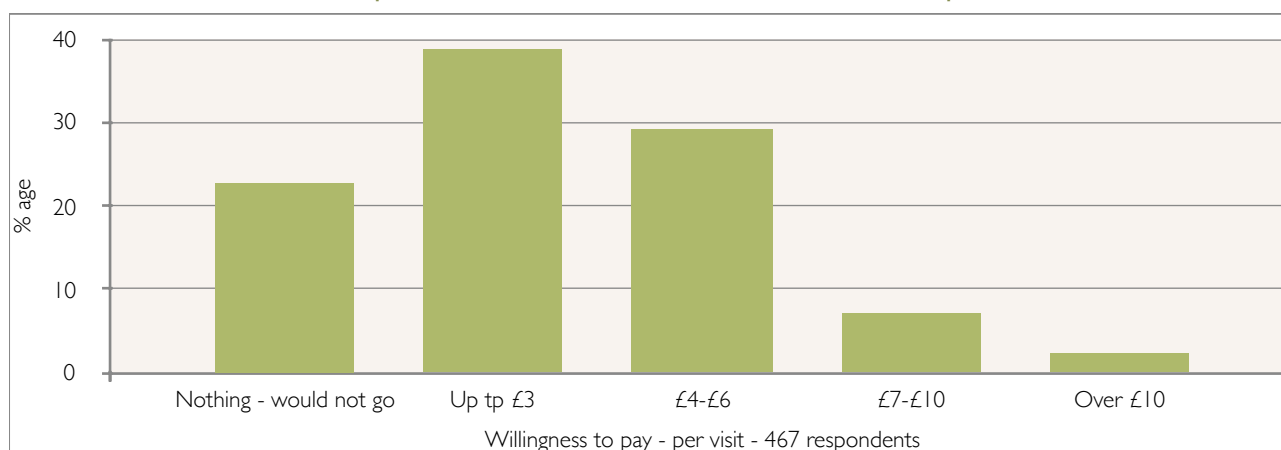
A key objective of the residents' survey was to understand the theoretical value that residents place upon accessing and enjoying the Dorset environment. The particular question focused specifically on the willingness-to-pay for accessing those environmental assets. The exact wording of the question was "If you had to pay for access to the Dorset environment (including all its aspects - coast, countryside, heathland, etc.) and there was no money from the public purse what do you think would be a reasonable price to pay per visit? Or for annual access?" Options were given in bands.

We do not know exactly whether this reflects the value they attach to the environment for direct use, or whether it also captures non-use values i.e. preserving the environment as an amenity value whether it is used or not. The likelihood is that it is a combination of both and the relative combination will differ on an individual basis.

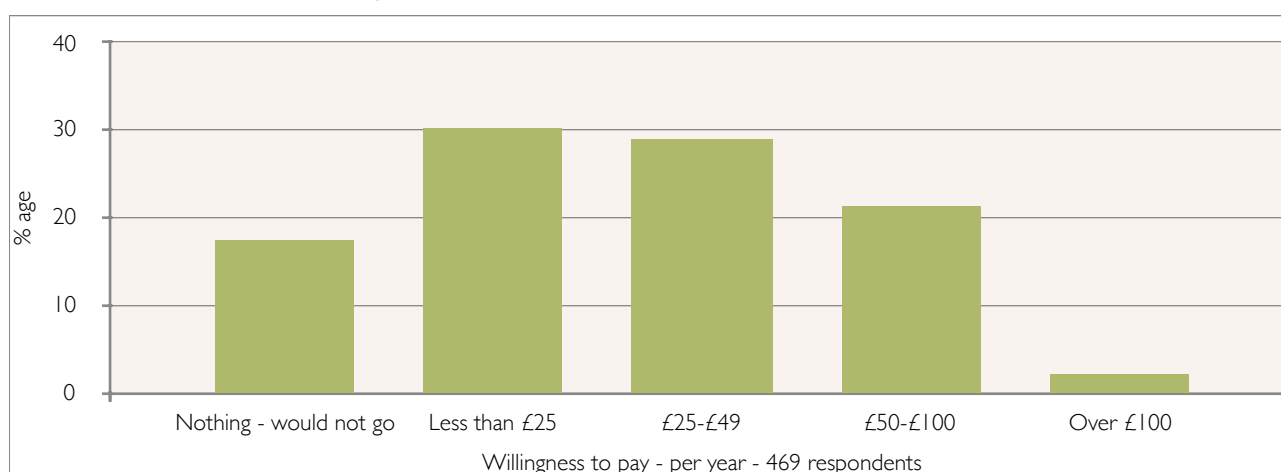
The survey showed that on average residents were willing to pay £3.57 per visit, or £34 per year. These figures broadly correspond to similar research previously undertaken elsewhere (as highlighted in our 'Impact' section - pp34 and 48 and in the Jurassic Coast companion

document). Given the high number of responses to the survey, there is reasonable confidence that the survey responses are broadly representative, although recognising the demographic profile of those who responded. We expect that the lower WTP from residents compared to visitors<sup>18</sup> may simply reflect the frequency of visit i.e. people tend to be prepared to spend more when they are on holiday because it is less likely they will visit that environmental asset again.

Willingness-to-pay for access to Dorset environment on a per visit basis



Willingness-to-pay for access to Dorset environment on an annual basis



A simple comparison of what residents currently pay to support the Dorset environment – indirectly through their Council Tax (£1.75 per head - see below) - and what they would be willing to pay in the absence of public support, shows that the latter amount is much higher. Of course, contributions through Council Tax will not be the only means by which people financially commit to accessing and maintaining those environmental assets. Residents will also contribute indirectly through parking charges, various taxation and other methods. Therefore, the Council Tax contribution is likely to understate the current total contribution made by residents/households. Nevertheless, the significant difference in the two figures (much less direct tax contribution than revealed willingness to pay - see below) does suggest that residents might be willing to contribute more in order to maintain and/or improve what they feel is fundamental to their wellbeing. There are, of course, some caveats.

<sup>18</sup> As part of our Impact Analysis of the Jurassic Coast and Dorset AONB, we undertook a simplified visitor survey which focussed on the designated areas.



- There are methodological complexities associated with willingness-to-pay questions and the wording is crucial. The resident's survey did not directly ask people how much they would be willing to pay through their Council Tax to improve and/or maintain the environment. They were asked about how much they value access to the environment. Therefore the comparison between the survey responses and current Council Tax contributions relate to two slightly different things.
- We did not undertake a choice experiment. That is, we did not ask residents whether they would be willing to contribute more to the Dorset environment at the expense of another activity (we recognise in the current financial climate the likelihood of increasing Council Tax contributions to fund additional environmental activity is extremely limited). If people were faced with a WTP question that made clear it would, for example, mean lower support for social care, then they may well answer in a different way. In the current financial climate, there would be an opportunity cost for increasing support to environmental management. Therefore, we need to be careful about simply drawing conclusions about the scope for greater contribution towards the environment given that people were not offered enough information to make a fully informed response.

However, whilst taking these important caveats into account, we still feel that the strength of the responses from the resident's survey does indicate that many households may be benefiting from a 'consumer surplus' over and above what they actually pay. In our analysis – assuming that the vast majority of environmental access in Dorset is currently free of charge (i.e. consumed at virtually zero cost<sup>19</sup>) – we assume the current price paid is represented indirectly by Council Tax contributions (plus other incremental contributions as mentioned previously). For many activities, such as walking in the countryside, going to the beach etc. there is no direct charge for accessing that environmental asset. Therefore the consumer surplus could be quite substantial: from this survey we might assume that it equates to circa £3.60 on a per visit basis.

This analysis is important and interesting for two broad reasons:

- Firstly, the resident's survey does indicate that people place a much greater value on accessing the environment than they currently have to pay (either directly or indirectly). If we assume that that value reflects the benefit they receive, then the environment is delivering benefit much greater than is reflected in any market transaction. The extra benefit to residents may not be reflected in any of our market-based estimates contained in Definitions and Valuations section above.

#### How much of council tax bill do residents think is spent on maintaining coast and countryside?



<sup>19</sup> We recognise that, in reality, the cost of accessing the environment will rarely be zero - if it were to include aspects such as travel costs. As we cannot know what typical travel costs would be, the analysis of consumer surplus is illustrative, rather than exact.

For comparison purposes, we were interested in understanding how much people felt they were already contributing to the care and maintenance of the Dorset environment indirectly through their Council Tax. They were asked “The average council tax in West Dorset is £1,680, how much of the council tax bill do you think is currently spent on maintaining the coast and countryside? The majority felt that they contributed less than £10 on an annual basis. However, a significant number assume that their current contribution is greater than this, with 9% assuming that the contribution is greater than £50 per household annually. In fact, Dorset County Council spends £3.93 per household (or £1.75 per head) each year on specific coast and countryside services. Most respondents assume that a greater proportion of their council tax is spent on coastal and countryside services than is actually the case.

- Secondly, even though we may not know the true extent of the gap between what people currently contribute and what they would be willing-to-pay, the survey does indicate that there is a significant gap. Therefore, there could be scope for capturing more of this value through market-based transactions i.e. encouraging people to (directly or indirectly) pay more for accessing and conserving that environment. We discuss this more fully in later sections of this report.

### Revealed Preference

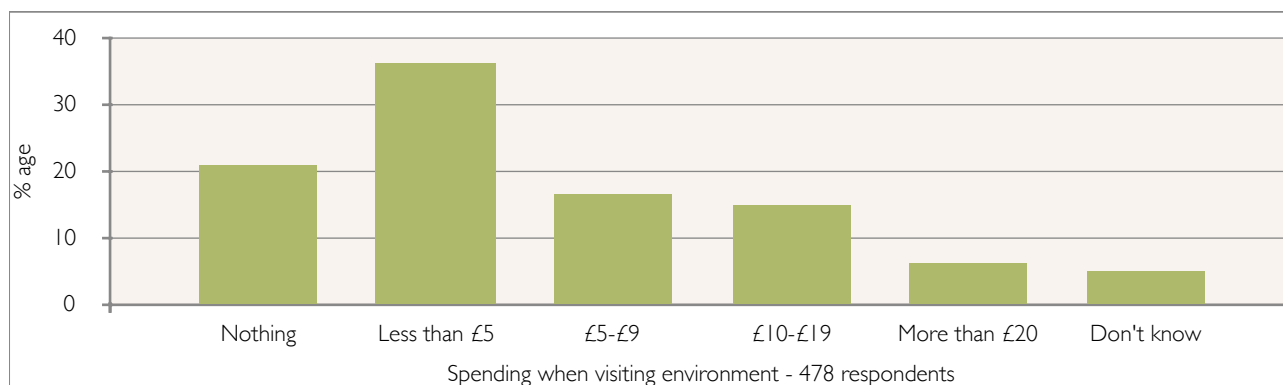
Based on the premise that value is revealed by what people actually pay when accessing the environment, an alternative market-based approach is to measure ‘revealed preference’ through the costs they indirectly incur whilst they are enjoying environmental assets. There are a wide number of costs that could be considered, including travel costs and foregone earnings, which we have not have been able to capture within the limited scope of this work. However, this could be revealed through purchasing activity of residents enjoying the Dorset environment. We did include a question in the survey about this aspect. Again, based on the assumption that what they spend (the cost) equates to the benefit, which they receive, theoretically, this should indicate the value they place on that environmental access. Such ‘proxy’ estimates of revealed preference have been used in similar reports/contexts when there is actually no cost of access.

This can be a complicated technique, not least because it is difficult to separate out the benefit from consuming other goods rather than enjoying the environment. For example, if someone pays £1 to buy an ice-cream whilst sitting on the beach admiring the Jurassic Coast cliffs, then a significant proportion of that cost will reflect the benefit they receive from consuming that ice cream. However, a proportion could also reflect the value they attach to sitting and admiring the view. Disentangling the two factors is almost impossible, especially when considering them on an aggregate basis (as in this section).

However, the survey responses have been useful in that they do support the view that people spend a reasonable amount of money when they visit the Dorset environment (coast and/or countryside). Implicitly, this will reflect some of the value from accessing the environment itself. From the residents’ survey, we find that, on average, people spend £6.08 each time they visit the coast or countryside.

Using revealed preference, the expenditure incurred whilst enjoying the environment could act as a proxy for the value that people attach. In reality, only a proportion of the expenditure will reflect the intrinsic value that people are placing on enjoying the environment. Some of this may already be reflected in people’s response to the WTP question.

### How much residents typically spend when they are visiting the Dorset environment



### Hedonic pricing

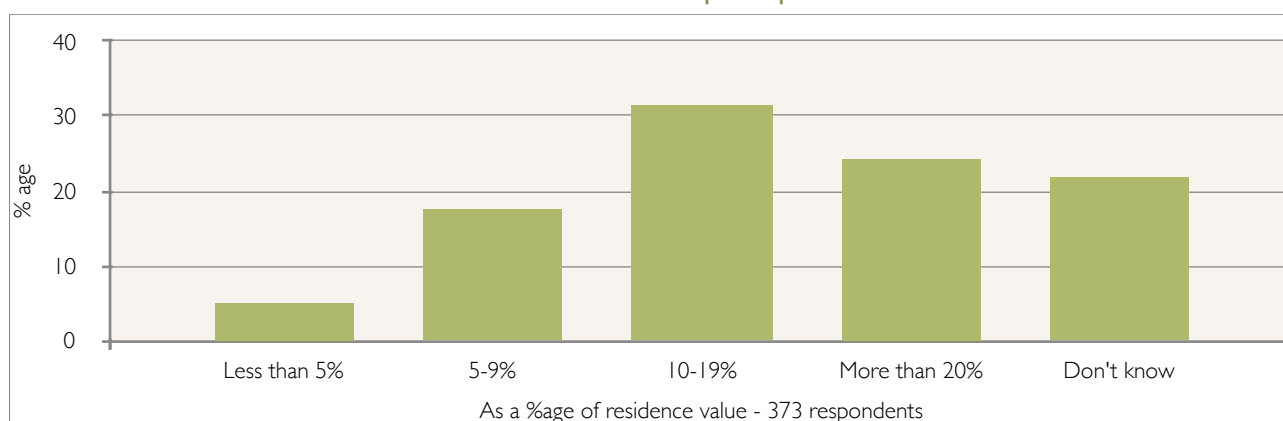
The third approach that we have applied is to look at valuation from a hedonic pricing perspective: identifying environmental value in the prices of other assets. We do this by looking at the 'contribution' that the high quality of Dorset's environment has had upon absolute house prices.

In theory, hedonic pricing would normally mean ability to 'deconstruct' the item being researched (in this case the Dorset environment) into its constituent characteristics, and then obtaining estimates of the contributory value of each characteristic separately. Also, it would require that the composite good being valued (housing) can be reduced to its constituent parts: that the market values each part separately.

In our approach, we simply asked residents whether they feel the quality of the local environment has put any 'price premium' on their house price and, if so, what their estimate of the extent of this premium. Because we are asking a question rather than observing market prices objectively, this is not a scientific hedonic pricing approach. The amount of data that would need to be collected and worked to achieve the theoretical ideal would be extremely large and there would remain a series of other methodological difficulties. Finally, it is important to note that responses will have been received from existing residents; many of whom would have purchased their house some years ago: their calculations are not, therefore, based on recent market transactions.

The responses to this survey question act as a useful tool for inference: they infer the broad value that house owners attach to their property in terms of the quality of the local environment. Of the 420 residents who responded to the question, over 90% felt the quality of the local environment did give them a positive 'price premium'. Of those that answered positively, the majority felt that the premium was 10%+ of their property value.

### Stated value of house price premium



The average price premium equated to 13.6% (median average 15%) over the whole survey sample. If we apply that to the latest estimate of the average house price in Dorset (£230,633 in August 2015), this suggests an estimated 'environmental quality' price premium of circa £31,000 on a typical house in Dorset. For those who responded to the survey, this may be an underestimate of the true valuation because – as stated previously – they tend to own larger houses and the average house price we use is based on all house types in Dorset. Equally, it may be an overestimate, because it could be argued that larger houses tend to have more space and be located in rural areas – locations of potentially higher environmental quality.

Because we may not have a representative sample, we cannot say with certainty whether a similar price premium would be attached to those owning smaller properties. Nevertheless, this analysis reveals another finding from the survey which indicates that Dorset residents believe the high quality of the local environment positively affects their asset wealth.

## Conclusion

The objective of the residents' survey, undertaken to stress-test other findings in the overall report, was to gain an understanding of the value that Dorset residents place on the local environment. We wanted to understand how important it was for their personal wellbeing. It complements the valuations we include elsewhere in the report – primarily in the earlier 'Definitions and Valuations' section – that are largely 'market-based' valuations that may not necessarily fully reflect the intrinsic value that many people also hold.

We attempted to capture this more intangible element through a number of questions in the residents' survey. The response level to the survey was high and the survey was distributed on a randomised basis. Therefore, we have confidence that the responses are broadly representative, whilst being mindful of the potential for some 'selection bias'. Our multi-faceted approach (through willingness to pay, revealed preference and hedonic pricing) cannot meet the highest standards of academic rigour. Nevertheless, it does broadly correspond to approaches adopted in other similar studies and the results from each method do suggest perceived real value for Dorset residents from the Dorset environment.

Rather than concentrating on any exact measurement of value, we wanted to better understand the broad scale of that value. For some, placing a monetary value on the intrinsic importance of the Dorset environment is not easy, or even desirable. By looking at valuation from a number of perspectives, however, **we have shown that residents do place a significant value on being able to access and enjoy the Dorset environment. Furthermore, the inferred value is greater than the current indirect contribution the majority will make through other means, such as Council and Income Tax contributions.** We discuss the implications - in terms of potential avenues of extracting those values or, at least, having them recognised in the wider discourse on future economic development– elsewhere in this report.

### 3 ECONOMIC IMPACTS

As part of the overall study brief, there was a requirement to undertake two specific impact assessments to determine:

- A. The value added to the Dorset economy through the existence of the Dorset AONB designation and the activities arising from its Management Plan and partnership;
- B. The value added to the Dorset economy by the inscription of the Dorset and East Devon Coast World Heritage Site and the activities resulting from its Management Plan and partnership.

There was also the requirement that both studies could act as free-standing pieces of research in their own right – for the benefit of their respective managing partnerships – as well as part of this, wider report. Two shorter summaries are contained in this report. However, for a more comprehensive understanding of the overall findings as well as the approach adopted then the complete documents should be accessed.

The methodological context that this work was developed within was that both designated areas are effectively ‘public goods’. That is, they are open and free for anyone to access and understanding the volume and value of use (by residents, visitors and/or businesses) is difficult to capture. This is not routinely captured by either of the designation teams. A further complication is that the ‘influence’ each respective designated area has on people’s choices or their economic behaviour is not known. As a consequence, this work has attempted to fill that knowledge gap through primary research in the form of surveys.

The other significant methodological issue for both studies is the difficulty in separating the impact of the designations themselves from the outstanding natural assets that sit behind them. This work has been undertaken many years after those designations have been put in place and therefore a comparison of conditions before (ex-post) and after (ex-ante) cannot be done. In the intervening years it is likely that specific elements of the impact of the designation itself i.e. visitor volumes, will have been ‘hidden’ in changes to the general macro environment.

The final methodological difficulty that presents this work is the fact that the two designated areas overlap for a significant part of Dorset, particularly as the area defined as the Jurassic Coast is not just the coastal strip but an area representing its influence and extends inland. However, much of the available data utilised i.e. visitor numbers by local authority district, does not differentiate between the designated areas. Therefore separating the impact is not possible and, as such, the estimates of impact should not simply be added together.



Given the uncertainty that is inherent in any such approach, the work attempts to look at economic value from a number of different routes. The aim is to present layers of information that will help corroborate the findings. Whilst each route looks at economic value in slightly different ways, the aim was to build a picture of the scale of economic impact.

Economic impact in each of the reports is expressed as the influence of the designated areas. There are a multitude of factors that will affect the number of visitors who come to Dorset (and East Devon), what they spend when they are here, the performance of local businesses etc. The influence of the designated areas is one of the factors – which we attempt to separately identify – but it should not be considered the only influence.

# Placing an economic value on the Dorset AONB

## Introduction:

This report acts as a summary of the findings contained in the more comprehensive analysis provided to the Dorset Area of Outstanding Natural Beauty (AONB) Partnership. It highlights the headline findings and a broad description of the approach taken. More detailed analysis of the findings, alongside the methodological approach is contained in the main report.

## Summary:

The headline result from the work undertaken in this report is that **we estimate that the Dorset AONB helps influence circa £65mn of output in the wider Dorset area on an annual basis and helps support up to 1,200 jobs.**

What cannot be said with certainty is how much of this estimate can be associated with the designation itself i.e. the 'Dorset AONB', or simply due to the existence of the outstanding landscape and natural beauty of the area. Given the positivity expressed in all of the surveys undertaken to support this work, it is highly likely that **the existence of the AONB itself has helped to increase the scale of benefits to the area significantly** but it is difficult to identify the exact role the designation has played.

However, due to the Jurassic Coast and the Dorset AONB 'overlapping' in large parts of Dorset, it is equally important to recognise that it has been difficult to separate the impact of the Dorset AONB from the Jurassic Coast (as part of this overall work we have also undertaken a similar exercise for the Jurassic Coast). *Therefore, the estimate of economic impact, or influence, for the two designated areas should not simply be added together.* It is likely that there will be overlap in the estimates. For example, many visitors coming to the area will visit the protected landscape of the AONB, as well as the outstanding coastline of the Jurassic Coast. 'Attributing' visitor expenditure to one or the other designated areas is not possible at an aggregate level given the data which is available. This is a fundamental point to recognise when interpreting the estimates contained in the subsequent analysis.

The surveys highlight the positive view of the impact of the AONB designation held by visitors, businesses and residents. It shows that the quality of the Dorset environment is a key influence for people to visit the area. The business survey showed a demonstrable positive impact of the AONB status on businesses' performance.

The Dorset AONB has played an important role in helping to conserve and protect the landscape so that it continues to attract people to the area. The Dorset AONB team works closely with other organisations and private land owners to extract value from the designation through the leveraging additional funding.

Finally, the value that residents attach to the Dorset environment – expressed in the surveys as willingness-to-pay and much of it encompassing the Dorset AONB – appears relatively high, certainly greater than the current indirect cost they may currently contribute to its ongoing management. It is clear that residents highly value the contribution the Dorset environment makes to their own well-being. It is also clear that residents continue to value the largely *free and open* access currently afforded.

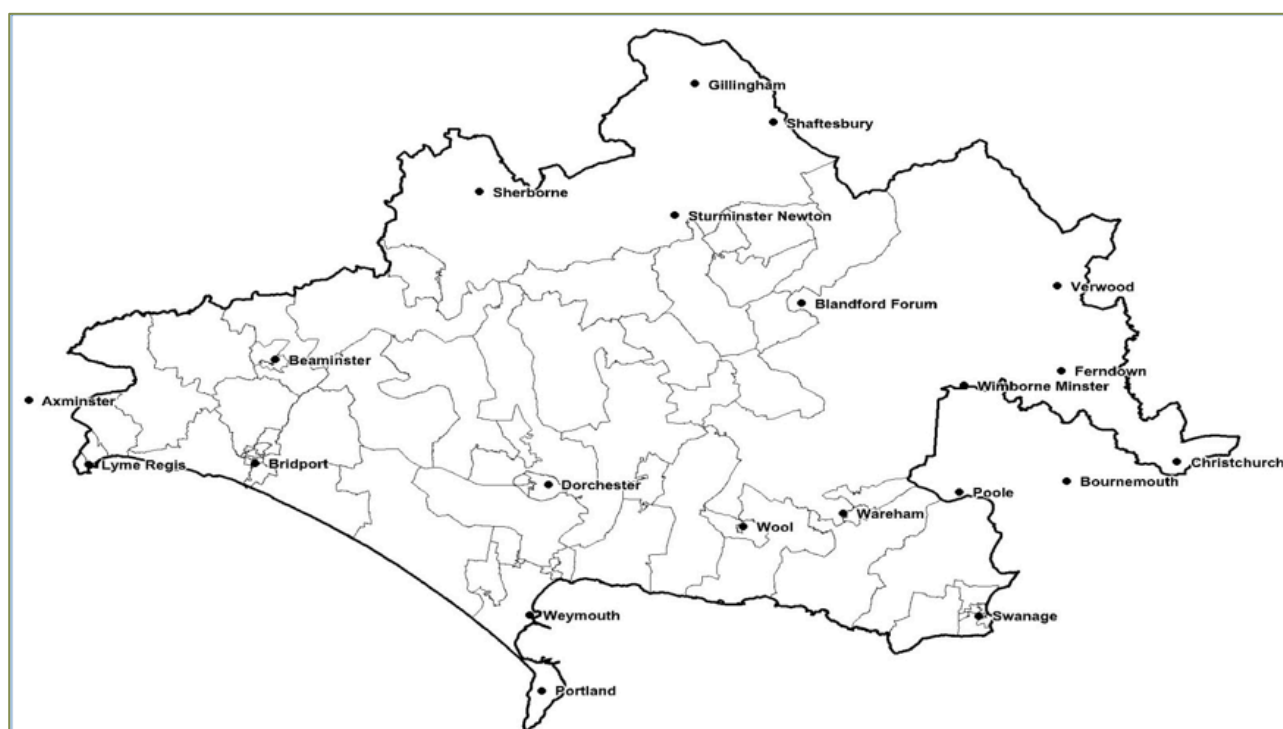
## General Approach:

To estimate the economic activity that relates to the Dorset AONB, we have undertaken a number of steps. Each step represents a different approach to estimating the economic activity and progressively *narrows* that relationship between economic activity and the *value of the designation itself*. The four steps that form the structure of the report are:

1. Firstly, we make an estimate of *all* the economic activity that takes place *within* the defined Dorset AONB area (see later comment on definition)
2. Secondly, following a similar methodology and also following on from work done in 'Descriptions and Values' Section, we make an estimate of the economic activity that relates to our definition (in terms of flows) of the environmental economy
3. Thirdly, we *illustrate* the economic activity (impact) that can be specifically associated with the existence of the assets that sit behind the Dorset AONB i.e. outstanding countryside and conserved natural landscape
4. Finally, we focus on *illustrating* the value of the designation itself, understanding whether the AONB status has provided *specific* and *additional* stimulus over and above what would have been expected anyway.

Our expectation is the value of economic activity will decrease with each step; each step effectively representing a sub-set of the previous estimate.

### The Dorset AONB as defined by Lower Super Output Areas (LSOAs)



#### 1. Valuation of all economic activity that takes place within the Dorset AONB area:

Based on a relatively tight definition we have been able to build a *profile* of the extent of economic activity that takes place within the Dorset AONB. Given that economic output data does not exist below the Dorset-level we have needed to formulate our own approach using proxies for economic activity (employment share and population).



Following this approach, we estimate that *total economic activity (output)* within the Dorset AONB equates to circa £1.47bn (2013 prices). Expressed in current prices the equivalent figure is **£1.55bn**<sup>20</sup>. This figure represents our estimate of the *total* value of economic activity that takes place within the Dorset AONB and should be viewed as the *flow* of economic activity (output, or Gross Value Added) on an *annual* basis. This does not represent the value of the designation itself (which we address later). It does show, however, that significant levels of economic activity take place within the AONB and the area has an important economic role to play.

In employment terms, we estimate that approximately 30,900 people work within the Dorset AONB, the lower proportional share reflecting its relative rurality.

It is fundamental to note that as part of this overall report we have also undertaken a similar exercise for the Jurassic Coast, using the same approach. **The two estimates should not simply be added together, given that the two designated areas overlap through a large part of Dorset.** There are also areas where the two defined areas do not overlap - the Dorset AONB estimate will contain economic activity inland from those coastal areas, whilst the Jurassic Coast estimate will include activity to the eastern Dorset coastal corridor as well as into East Devon.

However, we attempt to address this issue by looking at those areas where the designated areas overlap and by taking account of the 'overlapped' areas. By doing so, we can make an estimate of the combined impact of the two designated areas. It should be noted however that this exercise has less 'weight' in our approach than understanding the two areas as separate entities.

In terms of assessing the combined value of economic activity (output) for the Jurassic Coast and Dorset AONB i.e. by excluding those areas where the AONB and Jurassic Coast overlap, we estimate that economic output equates to circa £2.9bn (2013 prices), or £3.0bn in current prices<sup>21</sup>. 63,400 jobs are sustained in the combined area. In effect, this represents the value of economic activity in the Dorset AONB plus those areas of the Jurassic Coast that sit outside the AONB i.e. the eastern Dorset coastal corridor and East Devon. This combined figure represents economic activity in both Dorset and East Devon. This estimate is broadly comparable to estimates of the economic output in the South Downs National Park<sup>22</sup>.

## 2. Valuation of the environmental economy within the defined Dorset AONB:

The Descriptions and Values section of the overall report contains our estimate of the value of the environmental economy within Dorset, Bournemouth and Poole. By using an employment-share approach specific to our definition of the environmental economy, we can also begin to understand whether there is a greater concentration of that environmental economy in the Dorset AONB.

What is of interest is that the environmental economy, on a proportional basis, does seem to be more concentrated in the Dorset AONB than seen for the economy as a whole. Perhaps this is not surprising given that some sectors in our definition are intrinsically rural; but also important to recognise that many others are not necessarily rural/land based. The argument that follows is that any wider policy focus on developing the environmental economy within Dorset (and the wider LEP area) should certainly include supporting its development within the Dorset AONB.

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<sup>20</sup> We have adjusted using national GDP deflators, utilising Q1 2015 figures to estimate a forecast figure for 2015.

<sup>21</sup> Our approach effectively excludes the area of the Jurassic Coast that lies within the Dorset AONB. Therefore a relatively high proportion of our estimate for the economic activity that lies within the Jurassic Coast is 'excluded'.

<sup>22</sup> 'Valuing England's National Parks' – National Parks England - 2013

Given the assumptions we make, we estimate that the environmental economy within the Dorset AONB is *directly* worth circa £183mn-£189mn in current (2015) prices. The range represents our narrow and wide definition of the environmental economy applied in Definitions and Valuations section. We estimate that between 6,300 and 8,400 jobs are sustained in the environmental economy within the Dorset AONB.

### Case Study: West Milton Cider Company

The West Milton Cider Company (WMCC) is a fairly small enterprise, created by Nick and Dawn Poole in West Dorset, within the Area of Outstanding Natural Beauty (AONB). They have been making cider since 2000 and selling it commercially since 2010. They produce a range of ciders and juices, through a slow natural fermentation process with no added chemicals. (See [www.westmiltoncider.co.uk](http://www.westmiltoncider.co.uk).)

Centred on the Bridport area, WMCC sells its products through a variety of outlets across Dorset, from Lyme Regis to Wareham: a range that is extending all the time. Apart from the owners, it employs one full-time employee and up to half-a-dozen volunteers at apple harvest and pressing time. The firm has grown its output significantly from under 5,000 litres at the start to an estimated 28,000 litres this season.

The company is a member of the Dorset Food & Drink initiative; a project led by the Dorset AONB team. Through this organisation, WMCC welcomes and appreciates the benefits that the AONB offers to relatively small, local firms that are dependent on the flow of services and products that are sustained by a healthy Dorset environment.

Nick and Dawn are sure that, through Dorset Food & Drink, the AONB supports their sales growth, boosting brand awareness and marketing, and building networks with other like-minded businesses. In particular, through its work on a series of well attended shows and festivals, Nick and Dawn say, “Dorset Food & Drink has helped us gain direct access to the public and, as with the Wimborne Food Festival in autumn 2015, has enabled us to get some important leads for developing new outlets for our products.”

They believe that Dorset Food & Drink, which WMCC has been a member of since the start two years ago, offers them a strong psychological boost. The AONB team are said to be enthusiastic and well organised, promoting a solid foundation of local value and image and driving efforts to produce and sell a high value range of products with a strong environmental theme. WMCC believes that, because of the AONB team’s work through Dorset Food & Drink, Dorset is becoming an important “foodie” county admired and envied by rivals without such support.

The experience of WMCC shows how the mutual promotion and conservation of Dorset’s environmental bounty can have positive effects on small local business start-ups and, thereby, the wider economy.



### 3. Valuation of economic activity influenced by the environmental quality/assets of Dorset and the specific Dorset AONB:

The difficulty with understanding the economic value of the wider Dorset environment and, specifically, the Dorset AONB is that they are effectively ‘public goods’. That is, they are open and free for anyone to access and understanding the *volume* and *value* of use (by residents, visitors and/or businesses) is difficult to capture. The absence of any sort of market valuation is a problem for policy formulation (and for economic impact assessments such as this report).

A further complication is that we do not know the 'influence' that those environmental assets have upon people's choices or their economic behaviour. Therefore we have needed to undertake primary research to inform our approach.

To understand the role that the Dorset environment and the Dorset AONB have on economic activity, primary research was undertaken in the form of surveys. Those surveys asked respondents to give their views on the importance of the local environment in their decision-making and general well-being. The surveys undertaken were:

- I. **Visitor survey** – a visitor survey was undertaken focusing on visitor's views of the Dorset AONB. The survey questioned those who responded on the influence of the environmental assets (countryside, coast and protected landscapes) on their decision to visit the area, and also interrogated their willingness-to-pay. The surveys were undertaken on a face-to-face basis at a number of sites in each area, the aim being to get a wide profile of visitor types. In total, 49 surveys were completed for the Dorset AONB. A further 149 surveys were completed for the Jurassic Coast and, where appropriate, we combine the findings to ensure a greater level of statistical robustness.
- II. **Resident survey** – an online resident survey was undertaken in Dorset focusing on people's views on the importance of the environment on their well-being, decision to live in Dorset and the monetary value they attach to accessing those environmental assets. The survey did not focus specifically on the Dorset AONB but did ask how frequently they accessed/enjoyed the different aspects of Dorset's environment, including the coast. In total, 480 surveys were completed in Dorset.
- III. **Business survey** – an online business survey was undertaken focusing on business's view on the importance of a high quality environment, and the Dorset AONB, on their development/performance. Questions also looked at whether they utilised the branding of the Dorset AONB in promoting their business, and whether additional visitor numbers had a positive revenue impact. Businesses were also asked about any negative impacts the designation may have had on their business. In total, 155 surveys were completed and the survey invitation was done on a randomised basis. Businesses in both Dorset and East Devon were invited to give their views.

Our approach to estimating the value attached to the Dorset environment, and specifically to the Dorset AONB, is based on 'triangulating' estimates from the responses we receive through the surveys undertaken. Where appropriate we combine the survey responses with other available data to derive our estimates.

### The visitor 'expenditure impact'

This work wanted to understand the impact that the quality of the environmental assets within Dorset (focusing predominantly on its countryside and coast) had upon visitors to the area. To inform this we undertook a visitor survey, as outlined above.

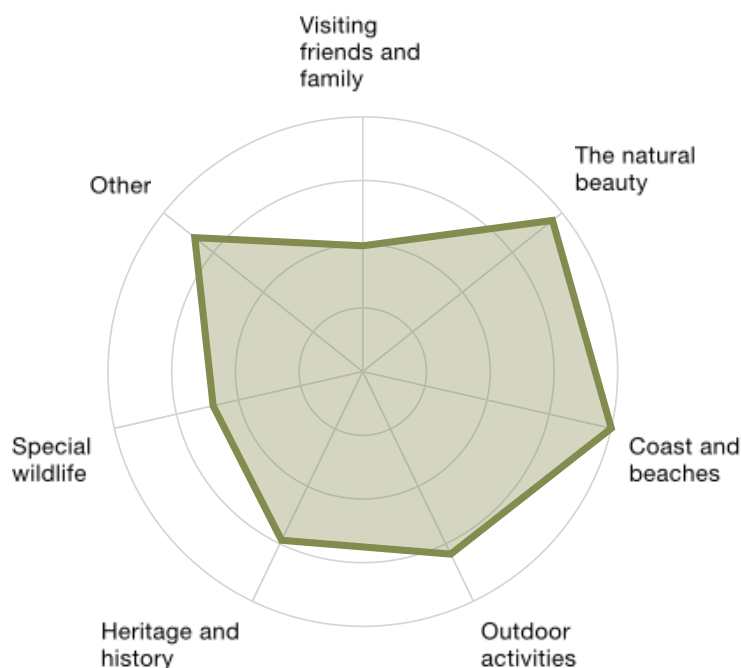
The three key issues that we wanted to identify in the visitor surveys was:

- a) the influence of different aspects of Dorset's environment in attracting people to the area,
- b) the influence of the Dorset AONB in their decision to visit the area,
- c) how much they would theoretically be willing to pay to access the Dorset AONB in the absence of public support.

a) *The influence of different aspects of the Dorset environment in attracting people to the area:*

It is clear from the visitor survey that the environment is the key factor in attracting people to the area. Visitors were asked to score certain factors on a scale of 0-100 in terms of how important they were in influencing their visit to the area. The chart below shows that the natural environment in general, and the coast and beaches in particular were the primary factors for their visit. The scores on the chart reflect the average response across those who responded to the survey. Immediately we can begin to build a picture of how important the Dorset environment is in attracting people to the area, and that the coast is also a key determinant in that overall picture.

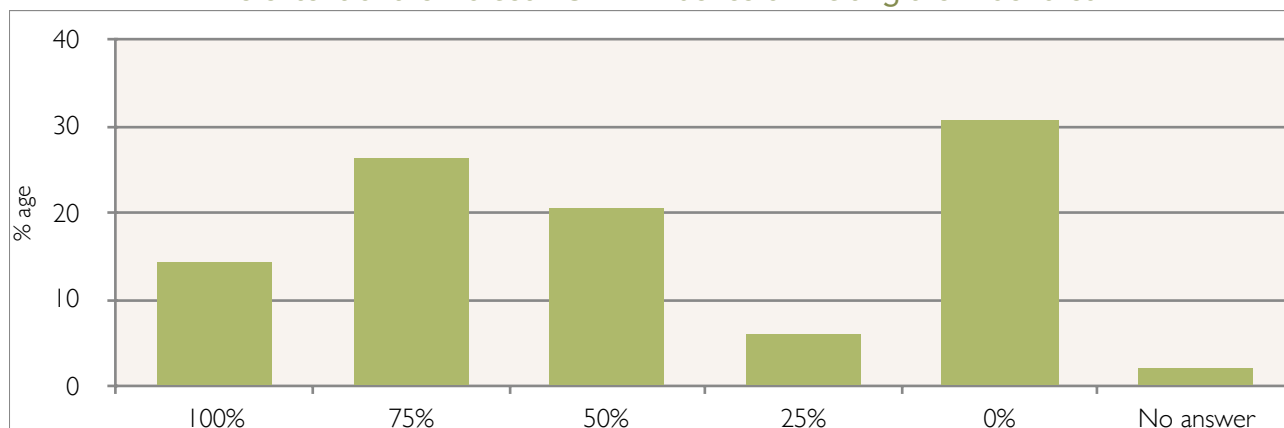
Factors influencing visitors to visit Dorset



b) *The influence of the Dorset AONB in their decision to visit the area:*

It was also important to understand the specific role that visiting the Dorset AONB may have played in people's decision to visit and holiday in the areas. Visitors were specifically asked "How much was the AONB status an influence on your choice to visit the area?". Respondents were given a choice of options between 'wholly influenced (100%)' to 'did not influence (0%)'.

The extent of the Dorset AONB influence on visiting the wider area

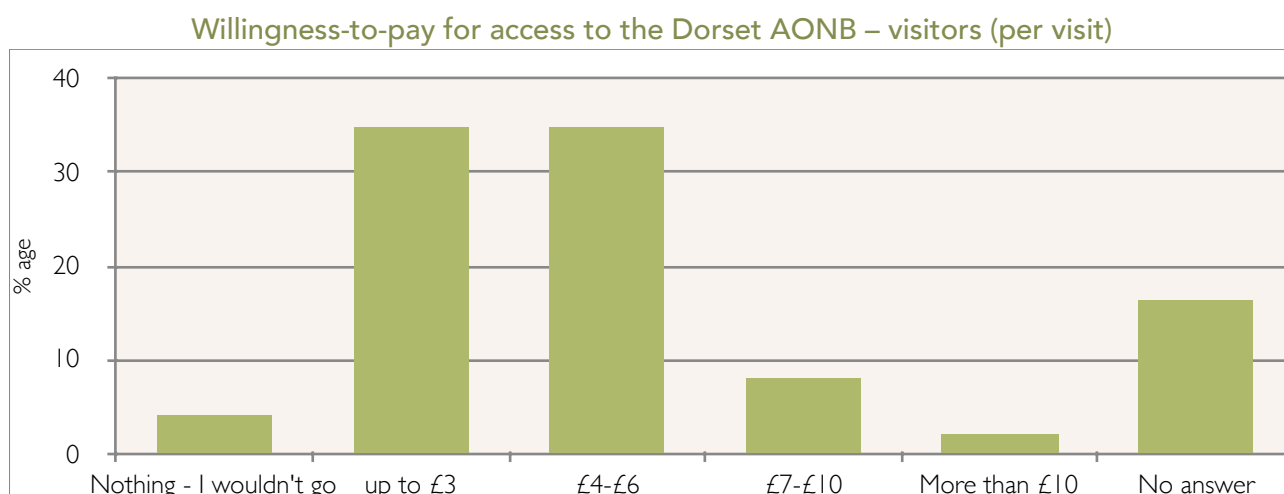


The chart shows that broadly two-thirds (62%) of people stated that visiting the Dorset AONB was partly, greatly, or wholly the reason why they visited the wider area. 31% of people said that it did not play any role in influencing their decision. Over the survey sample, the 'average' response (47% 'influenced') equated to 'partly' playing a role in attracting them to the area.

*c) Willingness-to-pay to access the Dorset AONB in the absence of public support.*

Visitors were also asked to answer the theoretical question about their willingness-to-pay to visit the Dorset AONB in the absence of public support. The specific question was *"How much is the Dorset AONB worth? This is a theoretical question. If you had to pay to be able to use the AONB (to help preserve and manage all its aspects – woodland, paths, monuments, habitats, coastline etc.) what would be a reasonable price to pay per visit? Or for annual access? They were given a range of banded options.*

Again, we are able to calculate the 'average' response, equating to £4.51. We have taken confidence this broadly matches the findings of similar studies taken elsewhere, as highlighted in the main report.



### Estimating the visitor expenditure impact of the Dorset AONB:

The responses to the visitor survey provide us with an *illustrative* basis in terms of understanding the *volume* of visitors and the *value* of their expenditure that has been influenced by the Dorset AONB. As with most approaches that utilise survey data, we effectively assume that the responses to the visitor survey are representative of the views of a wider population i.e. the whole visitor population within the defined geographical market.

The key survey response that we utilise in our approach is *the extent of influence* the Dorset AONB has in terms of encouraging people to visit Dorset. Our estimate of the average 'influence' is then combined with data that estimates the volume and value of tourism in the area to provide an estimate of the proportion of tourism expenditure that can be claimed to be *influenced* by the attraction of the Dorset AONB. This is then converted to Gross Value Added (GVA) to be consistent with our measurements contained elsewhere in the main report.

The overriding assumption in our approach is that the average level of influence stated by survey respondents directly links through to the proportion of total visitor expenditure in the area surrounding the Dorset AONB<sup>23</sup>. Clearly, there are limitations in this assumption. Not least

<sup>23</sup> We have used visitor expenditure data at a district level as our base data. We then adjust for the proportion of that visitor expenditure that more closely relates to our defined area. To reflect that more visitor activity would be concentrated in more populated areas in each district we have used a hybrid of the proportion of land and population to represent the Dorset AONB influence.

because those who were surveyed were visiting locations associated with the Dorset AONB at the time. Surveying did not take place in locations further afield. Therefore it is likely there will be some 'selection bias' in the survey responses and care is required in interpretation. To counter this potential bias we base our estimates on a relatively tight geographical focus.

Our estimate is that the Dorset AONB *helps influence* circa £67mn in value added from visitor expenditure per annum (current prices and expressed as Gross Value Added). Because we use survey data there are confidence intervals associated with the estimates; using this to inform the uncertainty inherent in this approach gives a range of £62mn to £71mn<sup>24</sup>.

### Estimating the impact on businesses:

As part of the overall approach to understanding the economic impact of the Dorset AONB, it was important to also gain an understanding of businesses' views on the role of the AONB on their operations/performance. This was primarily informed by a business survey, as well as a limited set of consultations directly with businesses.

It is an important part of the process of gaining confidence in our overall approach to place our estimates of impact from the business survey against earlier estimates of impact based on visitor expenditure. It is important to note that the impact estimates should not be viewed as separate, many of the businesses who responded to the survey will have benefited from the additional visitor expenditure and, in part, the benefits will already be reflected in the earlier expenditure benefits. Again, there may be an element of 'selection bias' i.e. those with a vested interest may have responded and it is important to bear that in mind when interpreting the subsequent analysis.

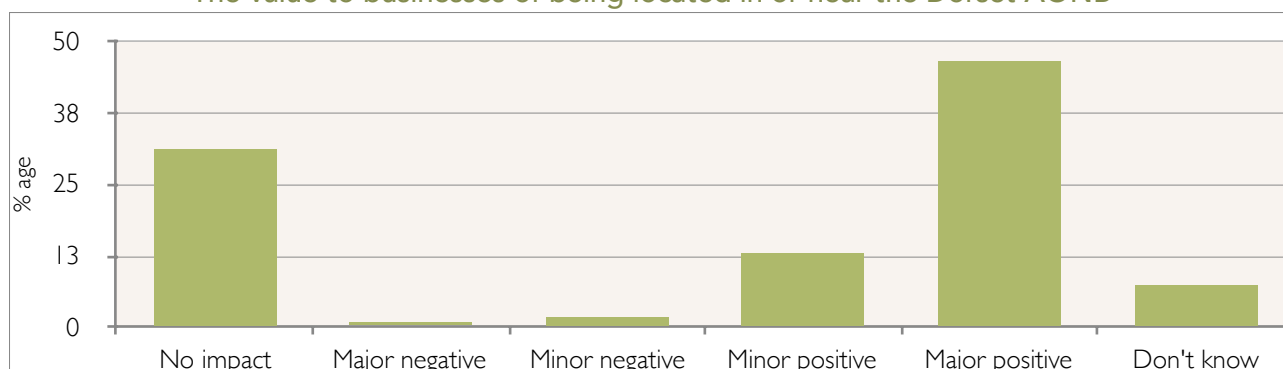
The majority of businesses (but certainly not all) who responded to the survey were involved in the sectors most closely related to the visitor economy i.e. accommodation providers, recreation and retail, and most were small i.e. less than five staff and/or less than £75,000 turnover. The majority had been established for more than five years and had always been based at their current site. It is clear that business awareness of the Dorset AONB is extremely high. 97% of the businesses that responded to the survey were aware of the Dorset AONB designation.

It is also clear that the general view is that the Dorset AONB has/does deliver significant positive benefits to their business. 65% (96) felt that the Dorset AONB did have an impact (positive or negative) on their business, with 52 stating that no impact had been felt. Businesses were asked to give an opinion on the "*what value does the fact that the landscape is protected and conserved (as an AONB) have on the business?*" Only 2% businesses who responded stated that it had any kind of negative impact, and then it was mostly classed as a minor impact. Conversely, 50% of businesses (out of 116 businesses who answered this question) felt that there was a major positive. In many respects, the response to this particular question serves to highlight the importance of the Dorset AONB.

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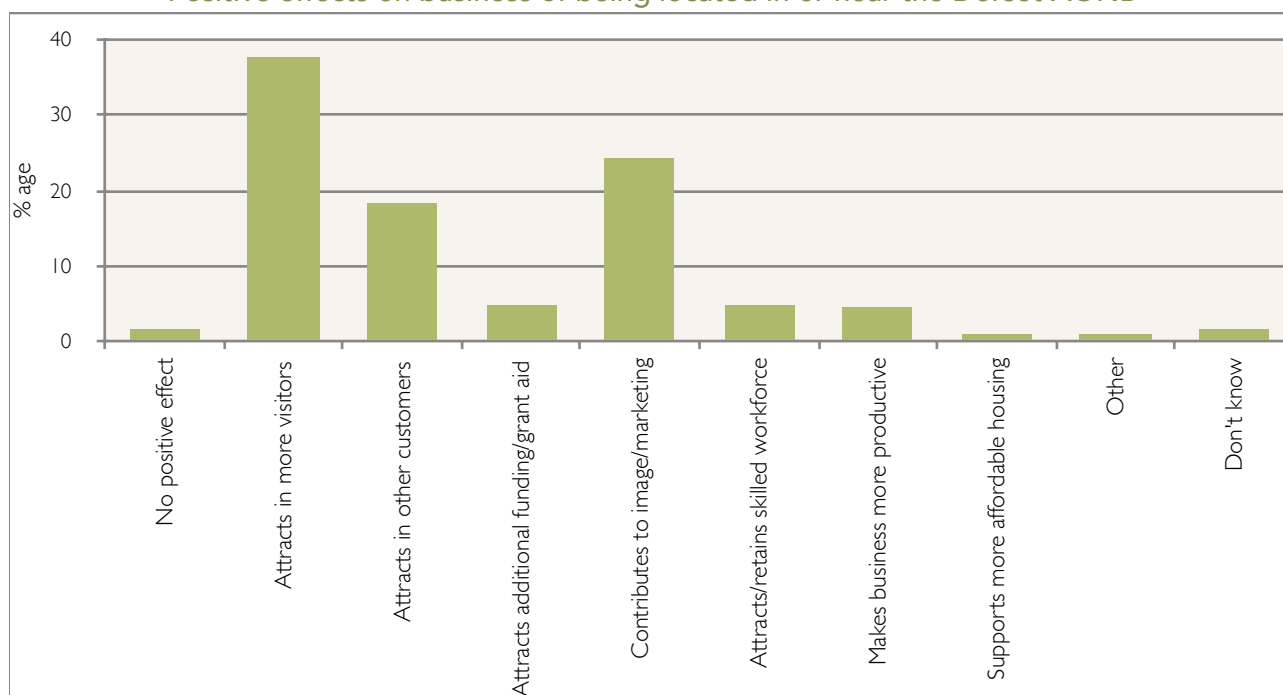
<sup>24</sup> We recognise that in reality the confidence interval associated with this estimate will be wider due to the fact that the visitor expenditure information that we use is also a survey-based estimate. Therefore it will also have its 'own' margin of error which isn't reflected in our range.

### The value to businesses of being located in or near the Dorset AONB



Businesses were also asked to detail the reasons why either a positive or negative impact of the Dorset AONB had been felt. They could highlight more than one factor. Encouragingly, only three responses highlighted that there was 'no positive impact', whilst 35 of those who responded said there was 'no negative impact'. Many businesses feel that the Dorset AONB plays a key role in helping their business; factors included attracting in more visitors into the area, generating income and contributing to the image/branding/marketing of the business. Whilst 76 respondents felt that attracting more visitors was a key benefit, only three felt that the Dorset AONB helped attract too many visitors.

### Positive effects on business of being located in or near the Dorset AONB

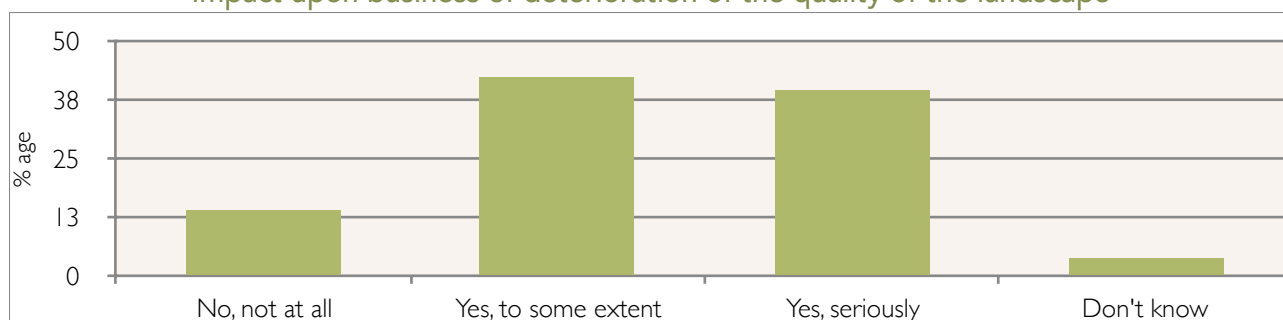


Of the factors that were felt to have a negative impact upon businesses, the most prevalent responses related to increasing house prices and affecting affordability, restriction of certain land use and increased costs.

Following on from the earlier questions, businesses were also asked that *"if the quality of landscape were to deteriorate for any reason, would you expect this to have any impact on the performance of your business?"* Again, the findings are encouraging and highlight the value that many businesses place on the Dorset AONB. Only 14 businesses felt there would be no impact upon their business performance, whilst 43 felt it would impact it to some extent and a further 40 felt it would have a 'serious' impact. Again, this simply demonstrates the significant value attached to the Dorset AONB.



### Impact upon business of deterioration of the quality of the landscape



The survey asked businesses about the influence that the Dorset AONB may have had upon their business performance - with a focus on the estimated 'uplift' provided to their annual turnover. Of those that were able to estimate the quantifiable impact<sup>25</sup>, the average uplift for those positively influenced by the Dorset AONB was 7.2% of annual turnover.

### Impact upon annual turnover of being located in or near the Dorset AONB



Based on the assumption that the survey responses were representative of the wider business population in terms of the influence the Dorset AONB has and size of business we are able to estimate the aggregated impact. Again, we counter any selection bias by applying a relatively tight geographical focus.

We estimate that the Dorset AONB helps *influence* business output by circa £62mn (current prices). It is important to note that this represents an annual flow of benefit and should be repeated year-on-year (dependent upon how effectively the Dorset AONB is managed for the benefit of businesses). Recognising that this estimate is dependent upon survey data, using the estimated confidence interval provides a range of £55mn - £69mn.

The outcome of this exercise broadly corresponds to the estimates relating to the benefits generated through visitor expenditure influenced by the Dorset AONB. Firstly, by looking at the estimated economic impact through two routes this provides a level of confidence in our estimates. We recognise there is significant uncertainty in any method, but the adoption of two

<sup>25</sup> Whilst 155 businesses completed the survey across Dorset and East Devon, only 74 businesses quantified the estimated turnover impact of the Dorset AONB.

pragmatic approaches has led to broadly the same conclusion. Secondly, we reiterate that the two estimates should not be viewed separately; in some respects they are measuring the same thing in different ways. The additional visitor expenditure associated with the Dorset AONB is captured as higher turnover/income by local businesses.

Whilst the business survey has captured benefits from some businesses that may not be reliant on the visitor economy – suggesting that benefits extend beyond the attraction of tourists – the majority of respondents to the business survey were in those sectors most reliant. As well as this, the primary benefit of the AONB status cited by businesses was the attraction of more visitors to the area and the associated additional income.

#### 4. Valuation of economic activity associated with the AONB designation

The final step in considering the economic value that can be associated with the Dorset AONB is to outline the added value that has been delivered as a consequence of the designation itself.

We cannot say with any certainty how much of the above estimate of economic benefit can be associated with the designation itself i.e. the 'Dorset AONB', or simply due to the existence of the outstanding landscape and natural beauty of the area. **It is highly likely that the existence of the designation itself has helped to significantly increase the scale of benefits to the area.** However, the fact that the AONB designation is over 50 years old means that it is hard to disentangle the designation and management from the landscape it has helped to conserve.

To look at the added value that can be more closely associated with the AONB status itself we look at a number of elements:

- i. **The benefits delivered as part of creating a Dorset AONB 'brand'.** Some of the focus of the Dorset AONB team has been to strengthen the brand, increase awareness and market the area on the basis of that branding. Certainly, as seen from the results of the visitor and business surveys, awareness of the Dorset AONB is high and it could therefore be argued that the brand activity delivers worthwhile added value in attracting visitors to the area.
- ii. **The additional funding that has been leveraged as a consequence of the designation and the work of the Dorset AONB team.** A further key activity associated with the designation is focused around leveraging additional funding into the area. A focus in our work has been to understand how the AONB status has helped leverage in those additional funds, and the role that the Dorset AONB team plays in promoting and coordinating schemes.
- iii. **The direct and indirect expenditure benefits delivered as a consequence of the AONB team being in place.** We also consider this, although recognise that these expenditure-based impacts will be relatively limited and arguably could be classified as a cost. However, it is a fundamental point to recognise that the benefits in i) and ii) above would not have been delivered without the AONB team being in place and the real significant benefits are represented by its activities rather than associated expenditure.
- iv. We highlight the findings of the willingness-to-pay (WTP) questions contained in the visitor survey and provide additional commentary on the results in terms of helping us inform our view on the value that people attached to having the designation in place (as a consequence of the protection and conservation that it helps deliver).

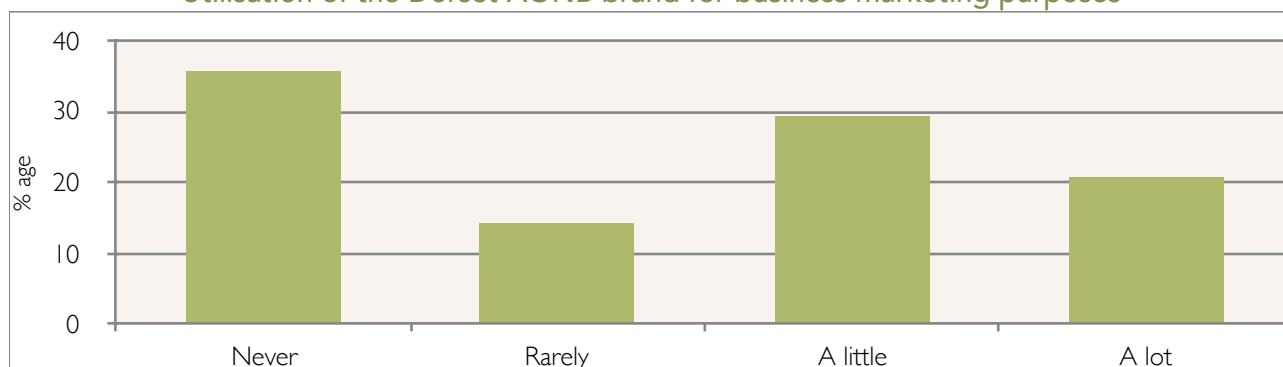
## The Dorset AONB brand

Creating a brand has been one of the activities for the Dorset AONB. Whilst the purpose of creating a brand has many different elements, a key focus has been to raise awareness and attract people to the area. The creation of a brand is one key area where the value of the designation can be *illustrated*. Without the time and resources devoted to building a brand then it could be argued that any branding approach would have been done in a piecemeal manner, if at all.

The Dorset AONB 'brand' is effectively a 'public good' which anybody – principally businesses – can use for their own purposes in stimulating additional activity. The Dorset AONB brand is not protected.

Businesses were asked whether they refer to the Dorset AONB when promoting/marketing their goods and services to customers. The results from the survey are encouraging in revealing the extent to which the brand is being adopted and utilised. Approximately 50% of those who responded to the survey said that they refer to the Dorset AONB; 21% using it 'a lot', with a further 29% using it 'a little'. 36% of respondents said that they never refer to the AONB, with 14% 'rarely' using it.

Utilisation of the Dorset AONB brand for business marketing purposes



### Leveraged funding:

Another activity that highlights the added value of the AONB status – and particularly the supporting management infrastructure – is the leveraging of additional funds beyond those that sustain that support network (as discussed later in the direct expenditure effect). There are a number of issues that are important to highlight regarding the exercise of identifying those leveraged funds that can be attributed to the Dorset AONB designation itself. This affects how we view the 'additionality' in a funding context.

- In comparison to the Jurassic Coast team, which tends to support project development and funding applications by other organisations, for the Dorset AONB the relationship is slightly different. Whilst they also play an important role in supporting funding applications by other organisations (see comment below), they have secured some significant funded projects which they have managed and delivered themselves. The Dorset AONB works in partnership with other organisations to help achieve its overall objectives as set out in its Management Plan. Given the relatively limited (and decreasing) resources directly available to it, partnership working is an important activity to achieve those objectives.
- The discussions also highlighted that the AONB status can have four principle benefits in funding applications. Firstly, the actual Dorset AONB team acts as a resource that help organisations develop their funding applications (and wider project development). Of course, those teams would largely not be in place without the designations and the revenue funding support that comes with the AONB status. The level of input and support by the

team varies on a case-by-case basis but the Dorset AONB team has assisted a large number of organisations. It is important to note that their role will not be purely reactive i.e. reacting to a request for help. In many cases the team (and their wider supporting partnership) will have played a key role in stimulating the idea/concept and been important in the project as it has been developed (pre-application). They play an important role on the demand-side.

A good example of this is the role that the Dorset AONB team play in stimulating applications into the agri-environment scheme. Over the past four years landowners in the Dorset AONB have secured approximately £19mn in agri-environment payments. The Dorset AONB estimates that approximately £2.4mn of this total has been directly stimulated by the AONB team over this period. The flow of agri-environment payments is increasing year-on-year and the AONB's 'influence' is also growing – meaning that the value of AONB support is also growing on an annual basis.

Secondly, and more intangible, is that there is a value of the designation in terms of branding within the fund application process. That is, many funding applications will have been successful because they placed the AONB status (or the fact that it is a protected landscape) at the core of their funding argument.

The third element is how protected landscape status helps organisations leverage in additional funding. This is particularly demonstrable within the AONB and the role that being in a protected landscape plays for landowners applying for agri-environment schemes. Schemes in protected landscape areas are often classified as higher priority, and protected landscape status benefits applicants in terms of scoring. As a consequence, the Dorset AONB has seen relatively high flows of agri-environment investment and a high proportion of successful schemes were stimulated, and/or supported by involvement by the AONB team.

The fourth element is the additional 'confidence' that funding organisations may get from knowing that projects in the designated areas are being developed in a relatively coordinated manner and that the AONB team (or wider partnership) has played a key role in helping coordinate activity. By having oversight of planned activities in their area the Dorset AONB team is able to improve coordination between projects and to improve complementarity between those projects. The consequence is that projects are developed in a less piece-meal fashion.

However, capturing the funding that has occurred as a *direct* consequence of the Dorset AONB activity does not fully tell the story. There are often *indirect* consequences of that original leveraged funding. Therefore simply capturing the direct leveraged funding will understate the full extent of added value delivered through AONB activity.

To demonstrate that causal chain we set out an example in the full report showing how initial AONB involvement then led to subsequent further investment into the area. This relates to the 'Wild Purbeck' Nature Improvement Area.

### **Direct expenditure impact:**

Although we recognise that the economic benefits delivered as a direct consequence of having the team in place is relatively minor in the context of the significant benefits highlighted elsewhere, this element is included in other comparator studies and we include for consistency purposes. It is useful to reiterate the point previously made – that the benefits generated as a consequence of leveraged funding, brand development etc. would certainly not be at the scale without the AONB team driving much of that activity.

However, the AONB designation does have a role to play in terms of the direct economic impact associated with running the management teams itself. Analysis of financial figures contained in the annual reviews shows that the average the core costs (expenditure) for the Dorset AONB team over the past five years have been circa £240,000, although decreasing on an annual basis (reflecting the financial pressure that the supporting local authorities have been under). The majority of this represents employment costs. In addition, it has also typically attracted circa £1mn in project funding, more of which is spent in the surrounding community. In equivalent Gross Value Added terms (to be consistent with our estimate in earlier sections of the report), this equates to circa £90,000-£100,000 per annum. In total, we estimate this equates to a circa £740,000-£800,000 impact in the supply chain (given the majority of project spend is in effect indirect spend) with a further £160,000 in knock-on benefits.

In terms of the impact of the core expenditure of the Dorset AONB team, what is not known is the 'opportunity cost' of the funding support provided. All the expenditure may not be seen as additional. However, our discussions with the teams and Dorset County Council indicate that support helps to leverage in further funding and so additionality is not a significant argument in the context of the overall scale of benefits we have estimated being delivered by the respective teams.

### **Willingness to pay:**

Although fraught with methodological difficulty, willingness-to-pay can be used as one of the proxies for estimating the value that people place on accessing an environmental asset. As previously highlighted, the average willingness-to-pay for accessing the Dorset AONB (in the absence of free and open access facilitated by public support) expressed in the visitor survey was £4.51 per visit

Whilst a willingness-to-pay question relating specifically to the Dorset AONB was not included in the Dorset residents survey (where the WTP question focused on the wider definition of the Dorset environment), there was a question regarding the WTP for accessing the Dorset countryside in general (of which the Dorset AONB is a large part). This showed that the average WTP (assuming this represents the view of household contribution) was circa £34 per annum. Given that residents currently tend to indirectly support the Dorset environment through their Council Tax contributions, the WTP expressed as an annual figure seems more relevant.

Given the relatively small figure that is currently contributed to the Dorset environment from the typical household Council Tax bill (£3.93 per household) then it could be argued there is considerable consumer surplus. If WTP is a proxy of the benefit that people receive, then the individual benefits of accessing and enjoying the Dorset environment are significantly exceeding the indirect costs of doing so.

# Placing an economic value on the Jurassic Coast World Heritage Site

## Introduction

This report acts as a summary of the findings contained in the more comprehensive analysis provided to the Jurassic Coast partnership. It highlights the headline findings and a broad description of the approach taken. More detailed analysis of the findings, alongside the methodological approach is contained in the main report.

## Summary

**The headline result from the work undertaken in this report is that we estimate that the Jurassic Coast influences circa £111mn of output in the area (Dorset and East Devon) on an annual basis and helps support up to 2,000 jobs.**

What cannot be said with certainty is how much of this estimate can be associated with the designation itself i.e. the 'Jurassic Coast', or simply due to the existence of the 'Dorset and East Devon coast'. Given the positivity expressed in all of the surveys undertaken to support this work, it is *highly likely* that the existence of the designation itself has helped to increase the scale of benefits to the area but it is difficult to identify the exact role the designation has played. As a result of the extensive survey work, we have reasonable confidence in assigning a significant proportion of the impact to the designation itself.

However, due to the Jurassic Coast and the Dorset AONB 'overlapping' in large parts of Dorset, it is equally important to recognise that it has been difficult to separate the impact of the Jurassic Coast from the Dorset AONB (as part of this overall work we have also undertaken a similar exercise for the Dorset AONB). *Therefore, the estimate of economic impact, or influence, for the two designated areas should not simply be added together.* It is likely that there will be overlap in the estimates. For example, many visitors coming to the area will visit the outstanding coastline of the Jurassic Coast, as well as the protected landscape of the AONB. 'Attributing' visitor expenditure to one or the other designated areas is not possible at an aggregate level given the data which is available.

The surveys highlight the positive view of the impact of the Jurassic Coast designation held by visitors, businesses and residents. It shows that the quality of the Dorset environment, and the Jurassic Coast in particular, is a key influence for people to visit the area. The business survey showed a demonstrable positive impact of the Jurassic Coast on businesses' performance.

The Jurassic Coast team have played an important role in developing a brand which has helped attract more people to the area, and to assist organisations extract value from the designation through leveraging additional funding.

Finally, the value that people attach to the Jurassic Coast – expressed in the surveys as willingness-to-pay – appears relatively high, certainly greater than the current indirect cost they may currently contribute to its management. It is clear that residents value the contribution it makes to the wider area and their own well-being.

## General Approach:

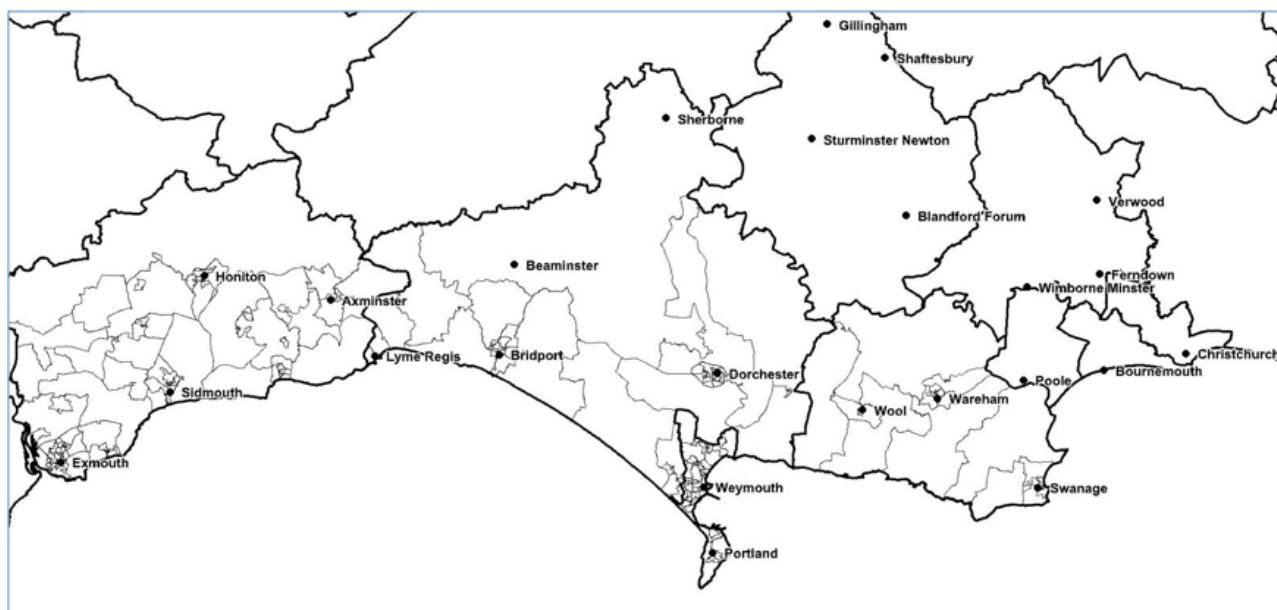
To estimate the economic activity that relates to the Jurassic Coast, we have undertaken a number of steps. Each step represents a different approach to estimating the economic activity and progressively *narrows* that relationship between economic activity and the *value of the designation itself*. The four steps that form the structure of the report are:

1. Firstly, we make an estimate of *all* the economic activity that takes place *within* the defined area of influence of the Jurassic Coast area (see later comment on definition)
2. Secondly, following a similar methodology and also following on from work done in 'Descriptions and Values' Section, we make an estimate of the economic activity that relates to our definition (in terms of flows) of the environmental economy
3. Thirdly, we *illustrate* the economic activity (impact) that can be specifically associated with the existence of the assets that sit behind the Jurassic Coast i.e. outstanding and unique geophysical coastal characteristics – highlighting the *influence* of the Jurassic Coast
4. Finally, we focus on *illustrating* the value of the designation itself, understanding whether the World Heritage Site status has provided *specific* and *additional* stimulus over and above what would have been expected anyway.

Our expectation is the value of economic activity will decrease with each step; each step effectively representing a sub-set of the previous estimate.

More detail on the methodology is contained within the companion document.

### The Jurassic Coast area of influence as defined by Lower Super Output Areas (LSOAs)



## 1. Valuation of all economic activity that occurs within the defined Jurassic Coast area

Based on a relatively tight definition (but wider than simply the protected coast) we have been able to build a *profile* of the extent of economic activity that takes place near to the Jurassic Coast. Our analysis is based on a geographical scope which the Jurassic Coast team felt best represented the 'area of influence' of the designation. This extends inland and is based on Lower Super Output areas. Given that economic output data does not exist below the Dorset-level we have needed to formulate our own approach using proxies for economic activity (employment share and population).



Following this approach, we estimate that *total economic activity (output)* within the Jurassic Coast area circa £2.86bn (2013 prices). Expressed in current prices the equivalent figure is **£3.0bn**<sup>26</sup>. This represents our estimate of the *total* value of economic activity that takes place within the defined Jurassic Coast area and should be viewed as the *flow* of economic activity (output, or Gross Value Added) on an *annual* basis. This does not represent the value of the designation itself (which we address later). It does show, however, that significant levels of economic activity take place within (next to) the Jurassic Coast and the area has an important economic role to play.

#### Case study: HIGHER WISCOMBE FARM

Higher Wiscombe is run by Alistair and Lorna Handyside and provides a series of award winning holiday cottages in East Devon. Each cottage is equipped to give five star gold standard and is located within 3 miles of the Jurassic Coast.

As a tourism business the Jurassic Coast is an extremely important location for attracting visitors to the area and to stay at Higher Wiscombe. It believes that 95% of the people who stay at its cottages access the Jurassic Coast at least once during their stay.

The Jurassic Coast brand is heavily used on its website and through social media and the company believes that it is a brand that is well understood by potential visitors. Higher Wiscombe are interested in the overall experience for the people who stay at their cottages and the fact that they are able to signpost visitors to the whole Jurassic Coast experience has led to a great deal of positive feedback. They believe that the Jurassic Coast increases interest in the coast beyond simply walking to 'discovering'.

The business believes that the World Heritage Site status is an 'accessible' brand and acts as an informal quality mark for those people who may not be aware of what is offered in East Devon and Dorset.

The business provides interpretation material to its visitors which has, in turn, been provided by the Jurassic Coast Trust. Another important part of their business is the referrals it receives as a consequence of being a Jurassic Coast business partner, providing one of the main referral routes for overall enquiries.

Overall, being a tourism company, the Jurassic Coast is an extremely important part of their business. It feels that the Jurassic Coast brand adds to its own marketing approach and helps it access different markets.



In employment terms, we estimate that approximately 62,900 people work within the defined Jurassic Coast area. The relatively high employment numbers reflects the major towns located along the coast.

It is fundamental to note that as part of this overall report we have also undertaken a similar exercise for the Dorset AONB, using the same approach. **The two estimates should not simply be added together, given that the two designated areas overlap through a large part of Dorset.** There are also areas where the two defined areas do not overlap - the Dorset AONB estimate will contain economic activity inland from those coastal areas, whilst the Jurassic Coast estimate will include activity to the eastern Dorset coastal corridor as well as into East Devon.

However, we attempt to address this issue by looking at those areas where the designated areas overlap and by taking account of the 'overlapped' areas. By doing so, we can make an estimate of the combined impact of the two designated areas. It should be noted however that this exercise has less 'weight' in our approach than understanding the two areas as separate entities.

<sup>26</sup> We have adjusted using national GDP deflators, utilising Q1 2015 figures to estimate a forecast figure for 2015.

In terms of assessing the combined value of economic activity (output) for the Jurassic Coast and Dorset AONB i.e. by excluding those areas where the AONB and Jurassic Coast overlap, we estimate that economic output equates to circa £2.9bn (2013 prices), or £3.0bn in current prices<sup>27</sup>. 63,400 jobs are sustained in the combined area. In effect, this represents the value of economic activity in the Dorset AONB plus those areas of the Jurassic Coast that sit outside the AONB i.e. the eastern Dorset coastal corridor and East Devon. This combined figure represents economic activity in both Dorset and East Devon. This estimate is broadly comparable to estimates of the economic output in the South Downs National Park<sup>28</sup>.

## 2. Valuation of the environmental economy within the defined Jurassic Coast area

The Descriptions and Values section of the overall report contains our estimate of the value of the environmental economy within Dorset, Bournemouth and Poole. By using an employment-share approach specific to our definition of the environmental economy, we can also begin to understand whether there is a greater concentration of that environmental economy in the defined Jurassic Coast area.

Given these assumptions we make, we estimate that the environmental economy within the defined Jurassic Coast area is *directly* worth circa £299mn-£352mn in current (2015) prices. The range represents our narrow and wide definition of the environmental economy applied in Descriptions and Values section and they also include East Devon. We estimate that between 5,800 and 8,100 jobs are sustained in the environmental economy within the Jurassic Coast defined area.

## 3. Valuation of economic activity influenced by the environmental quality/assets of Dorset and the defined Jurassic Coast area

The difficulty with understanding the economic value of the wider Dorset environment and, specifically, the Jurassic Coast is that they are effectively 'public goods'. That is, they are open and free for anyone to access and understanding the *volume* and *value* of use (by residents, visitors and/or businesses) is difficult to capture. The absence of any sort of market valuation is a problem for policy formulation (and for economic impact assessments such as this report).

A further complication is that we do not know the 'influence' that those environmental assets have upon people's choices or their economic behaviour. Therefore we have needed to undertake primary research to inform our approach.

To understand the role that the Dorset environment and the Jurassic Coast have on economic activity, primary research was undertaken in the form of surveys. Those surveys asked respondents to give their views on the importance of the local environment in their decision-making and general well-being. The surveys undertaken were:

1. **Visitor survey** – a visitor survey was undertaken focusing on visitor's views of the Jurassic Coast. The survey questioned those who responded on the influence of the environmental assets (coast) on their decision to visit the area, and also interrogated their willingness-to-pay. The surveys were undertaken on a face-to-face basis at a number of sites in each area, the aim being to get a wide profile of visitor types. In total, 146 surveys were completed for the Jurassic Coast.

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<sup>27</sup> Our approach effectively excludes the area of the Jurassic Coast that lies within the Dorset AONB. Therefore a relatively high proportion of our estimate for the economic activity that lies within the Jurassic Coast is 'excluded'.

<sup>28</sup> 'Valuing England's National Parks' – National Parks England - 2013

- II. **Resident survey** – an online resident survey was undertaken in Dorset focusing on people's views on the importance of the environment on their well-being, decision to live in Dorset and the monetary value they attach to accessing those environmental assets. The survey did not focus specifically on the Jurassic Coast but did ask how frequently they accessed/enjoyed the different aspects of Dorset's environment, including the coast. In total, 480 surveys were completed in Dorset. In addition, there was a further survey undertaken in East Devon that did focus more on resident's opinion on the value of the Jurassic Coast. There were 319 completed surveys in East Devon.
- III. **Business survey** – an online business survey was undertaken focusing on business's view on the importance of a high quality environment, and the Jurassic Coast, on their development/performance. Questions also looked at whether they utilised the branding of the Jurassic Coast in promoting their business, and whether additional visitor numbers had a positive revenue impact. Businesses were also asked about any negative impacts the designation may have had on their business. In total, 155 surveys were completed and the survey invitation was done on a randomised basis. Businesses in both Dorset and East Devon were invited to give their views on the impact of the Jurassic Coast.

Our approach to estimating the value attached to the Dorset environment, and specifically to the Jurassic Coast, is based on 'triangulating' estimates from the responses we receive through the surveys undertaken. Where appropriate we combine the survey responses with other available data to derive our estimates.

#### The visitor 'expenditure impact':

This work wanted to understand the impact that the quality of the environmental assets within Dorset (focusing predominantly on its countryside and coast) had upon visitors to the area. To inform this we undertook a visitor survey, as outlined above.

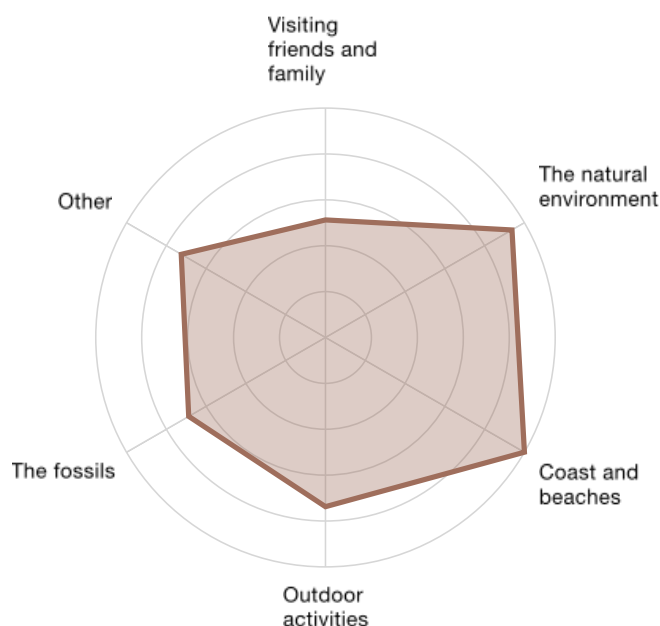
The three key issues that we wanted to identify in the visitor surveys was:

- a) the influence of different aspects of Dorset's environment in attracting people to the area,
- b) the influence of the Jurassic Coast in their decision to visit the area,
- c) how much they would theoretically be willing to pay to access the Jurassic Coast in the absence of public support.

#### *a) The influence of different aspects of the Dorset environment in attracting people to the area:*

It is clear from the visitor survey that the environment is the *key factor* in attracting people to the area. Visitors were asked to score certain factors on a scale of 0-100 in terms of how important they were in influencing their visit to the area. The chart below shows that the natural environment in general, and the coast and beaches in particular were the primary factors for their visit. The scores on the chart reflect the average response across those who responded to the survey. Immediately we can begin to build a picture of how important the Dorset environment is in attracting people to the area, and that the coast is also a key determinant in that overall picture.

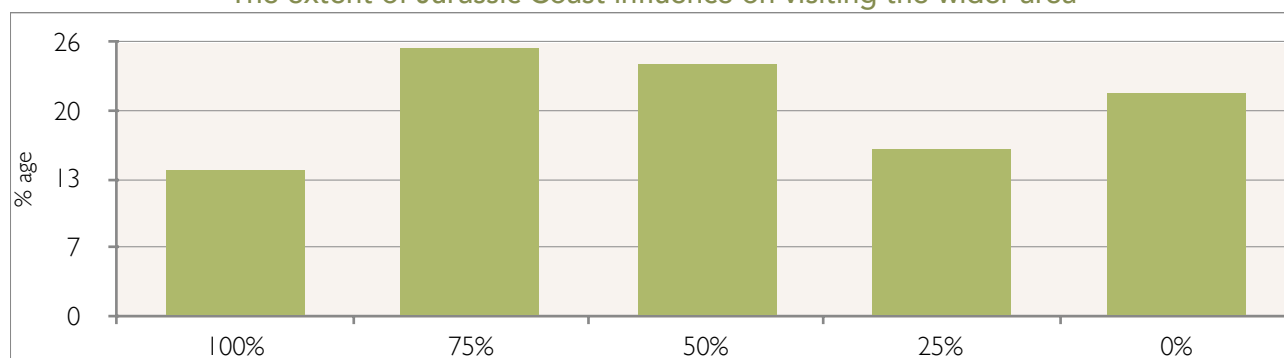
## Factors influencing visitors to visit Dorset and East Devon



### b) The influence of the Jurassic Coast in their decision to visit the area:

It was also important to understand the specific role that visiting the Jurassic Coast may have played in people's decision to visit and holiday in the areas. Visitors were specifically asked "How much did your desire to see the Jurassic Coast in particular (rather than Dorset or East Devon in general) influence your choice to visit the area?" Respondents were given a choice of options between 'wholly influenced (100%)' to 'did not influence (0%)'.

### The extent of Jurassic Coast influence on visiting the wider area

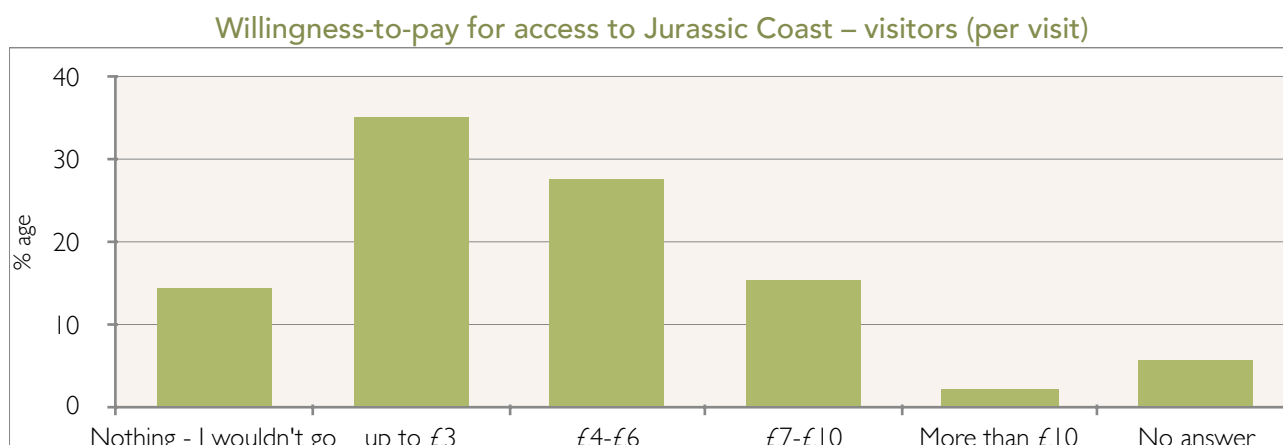


The chart shows that broadly two-thirds of people stated that visiting the Jurassic Coast was partly, greatly, or wholly the reason why they visited the wider area. 21% of people who responded to the question said that it did not play any role in influencing their decision. Over the survey sample, the 'average' response (48% 'influenced') equated to partly playing a role in attracting them to the area.

### c) Willingness-to-pay to access the Jurassic Coast in the absence of public support.

Visitors were also asked to answer the theoretical question about their willingness-to-pay to visit the Jurassic Coast in the absence of public support. The specific question was "How much is the Jurassic Coast worth? This is a theoretical question. If you had to pay for access to the coast (including all its aspects – beaches, cliffs, views, fossils etc.) what would be a reasonable price to pay per visit? Or for annual access? They were given a range of banded options.

Again, we are able to calculate the 'average' response, equating to £4.27. We have taken confidence this broadly matches the findings of similar studies taken elsewhere, as highlighted in the main report.



### Estimating the visitor expenditure impact of the Jurassic Coast

The responses to the visitor survey provide us with an *illustrative* basis in terms of understanding the *volume* of visitors and the *value* of their expenditure that has been influenced by the Jurassic Coast. As with most approaches that utilise survey data, we effectively assume that the responses to the visitor survey are representative of the views of a wider population i.e. the whole visitor population within the defined geographical market.

The key survey response that we utilise in our approach is *the extent of influence* the Jurassic Coast has in terms of encouraging people to visit the area (Dorset and East Devon). Our estimate of the average 'influence' is then combined with data that estimates the volume and value of tourism in the area to provide an estimate of the proportion of tourism expenditure that can be claimed to be *influenced* by the attraction of the Jurassic Coast. This is then converted to Gross Value Added (GVA) to be consistent with our measurements contained elsewhere in the main report.

The overriding assumption in our approach is that the average level of influence stated by survey respondents directly links through to the proportion of total visitor expenditure in the area surrounding the Jurassic Coast.<sup>29</sup> Clearly, there are limitations in this assumption. Not least because those who were surveyed were visiting locations associated with the Jurassic Coast at the time. Surveying did not take place in locations further afield. Therefore it is likely there will be some 'selection bias' in the survey responses and care is required in interpretation. To counter this potential bias we base our estimates on a relatively tight geographical focus.

Our estimate is that the Jurassic Coast *influences* circa £119mn in value added from visitor expenditure per annum (current prices and expressed as Gross Value Added). Because we use survey data, there are confidence intervals associated with the estimates; using this to inform the uncertainty inherent in this approach gives a range of £111mn to £127mn<sup>30</sup>.

<sup>29</sup> We have used visitor expenditure data at a district level as our base data. We then adjust for the proportion of that visitor expenditure that more closely relates to our defined area. To reflect that more visitor activity would be concentrated in more populated areas in each district we have used a hybrid of the proportion of land and population to represent the Jurassic Coast influence

<sup>30</sup> We recognise that in reality the confidence interval associated with this estimate will be wider due to the fact that the visitor expenditure information that we use is also a survey-based estimate. Therefore it will also have its 'own' margin of error which isn't reflected in our range.

## Estimating the impact on businesses

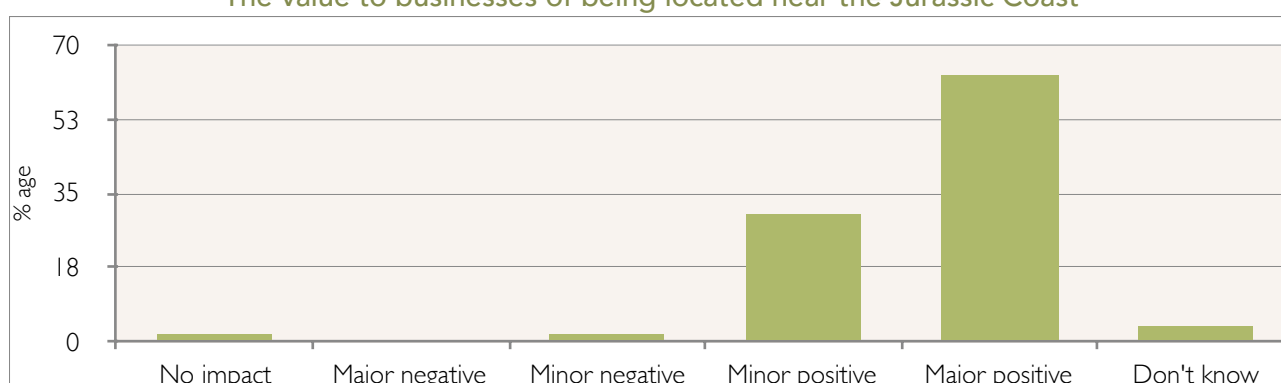
As part of the overall approach to understanding the economic impact of the Jurassic Coast, it was important to also gain an understanding of businesses' views on the role of the Jurassic Coast on their operations/performance. This was primarily informed by a business survey, as well as a limited set of consultations directly with businesses.

It is an important part of the process of gaining confidence in our overall approach to place our estimates of impact from the business survey against earlier estimates of impact based on visitor expenditure. It is important to note that the impact estimates should not be viewed as separate, many of the businesses who responded to the survey will have benefited from the additional visitor expenditure and, in part, the benefits will already be reflected in the earlier expenditure benefits. Again, there may be an element of 'selection bias' i.e. those with a vested interest may have responded and it is important to bear that in mind when interpreting the subsequent analysis.

The majority of businesses (but certainly not all) who responded to the survey were involved in the sectors most closely related to the visitor economy i.e. accommodation providers, recreation and retail, and most were small i.e. less than five employees and/or less than £75,000 turnover. The majority had been established for more than five years and had always been based at their current site. **It is clear that business awareness of the Jurassic Coast is extremely high.** All of the businesses that responded to the survey (155) were aware of the Jurassic Coast designation.

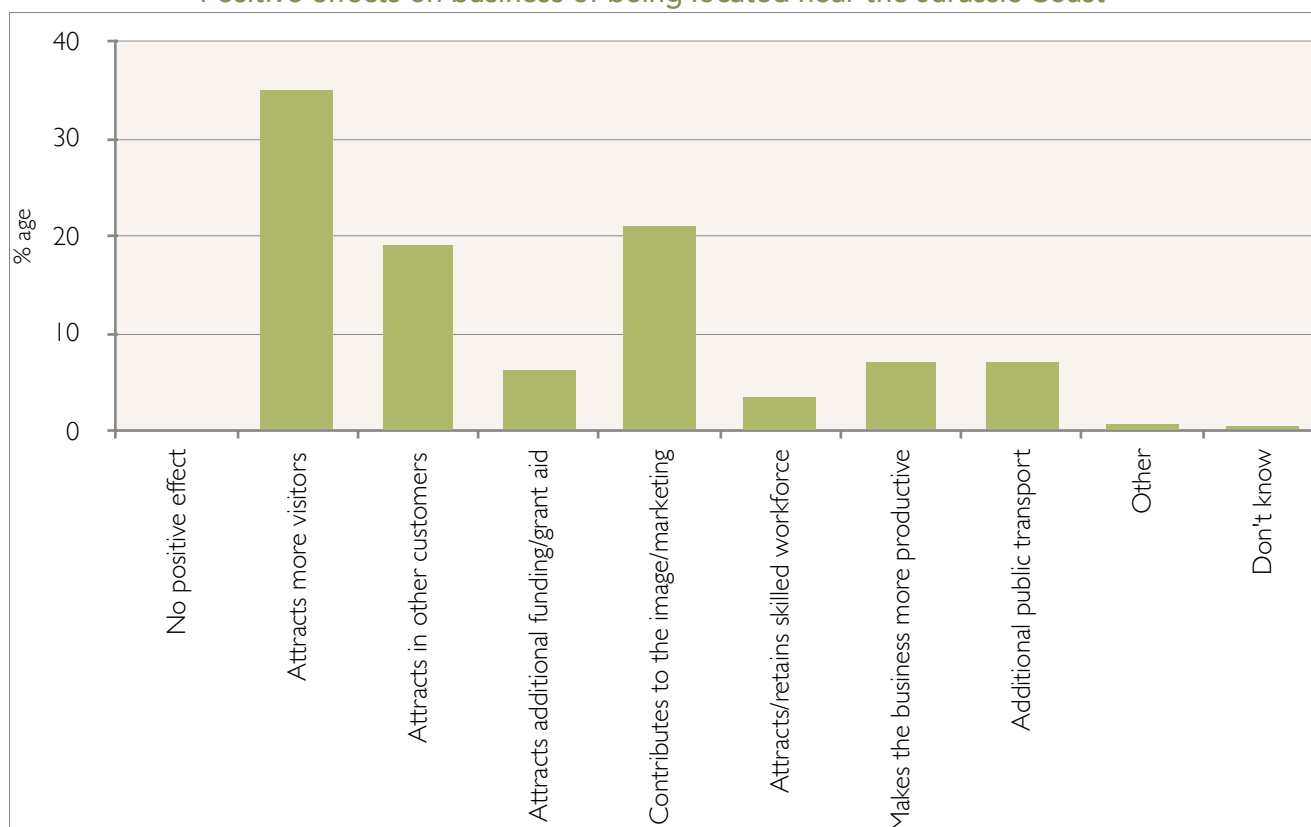
It is also clear that the general view is that the Jurassic Coast has/does deliver significant positive benefits to their business. 70% (108) felt that the Jurassic Coast did have an impact (positive or negative) on their business, with 30% (47) stating that no impact had been felt. Businesses were asked to give an opinion on the *"value of being located near the Jurassic Coast has on your business."* Only 2% businesses who responded stated that it had any kind of negative impact, and then it was classed as a minor impact. Conversely, 65% of businesses (out of 107 businesses who answered this question) felt that there was a major positive. In many respects, the response to this particular question serves to highlight the importance of the Jurassic Coast.

The value to businesses of being located near the Jurassic Coast



Businesses were also asked to detail the reasons why either a positive or negative impact of the Jurassic Coast had been felt. They could highlight more than one factor. Encouragingly, not one response highlighted that there was 'no positive impact', whilst 35% of those who responded said there was 'no negative impact'. Many businesses feel that the Jurassic Coast plays a key role in helping their business including: attracting in more visitors into the area, generating income and contributing to the image/branding/marketing of the business. Whilst 35% of respondents felt that attracting more visitors was a key benefit, only 2% felt that the Jurassic Coast helped attract too many visitors.

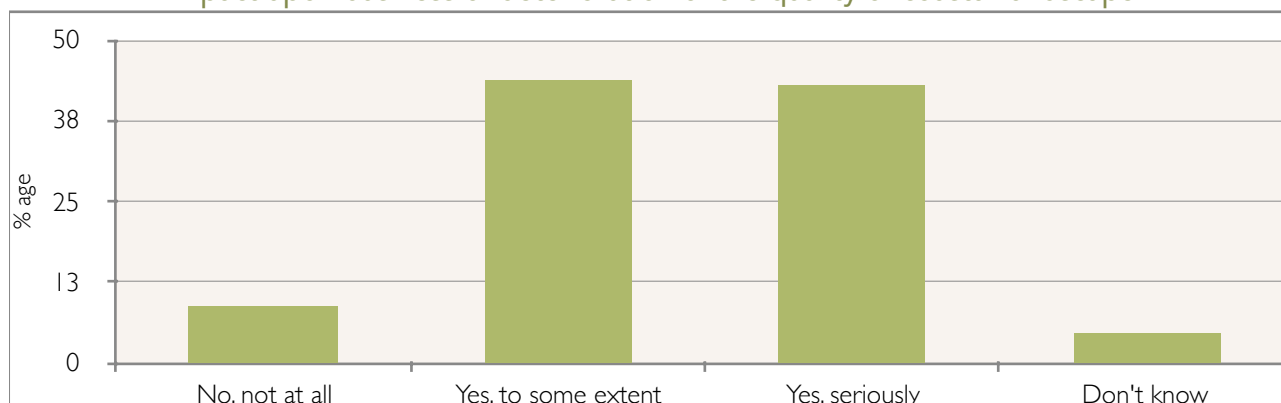
Positive effects on business of being located near the Jurassic Coast



Of the factors that were felt negatively impacted upon businesses, the most prevalent responses related to increasing house prices and affecting affordability, restriction of certain land use and increased costs.

Following on from the earlier questions, businesses were also asked that *"if the quality of coastal landscape were to deteriorate for any reason, would you expect this to have any impact on the performance of your business?"* Again, the findings are encouraging. Only 9% businesses felt there would be no impact upon their business performance, whilst 46% felt it would impact it to some extent and a further 45% felt it would have a 'serious' impact. Again, this simply demonstrates the significant value attached to the Jurassic Coast.

Impact upon business of deterioration of the quality of coastal landscape

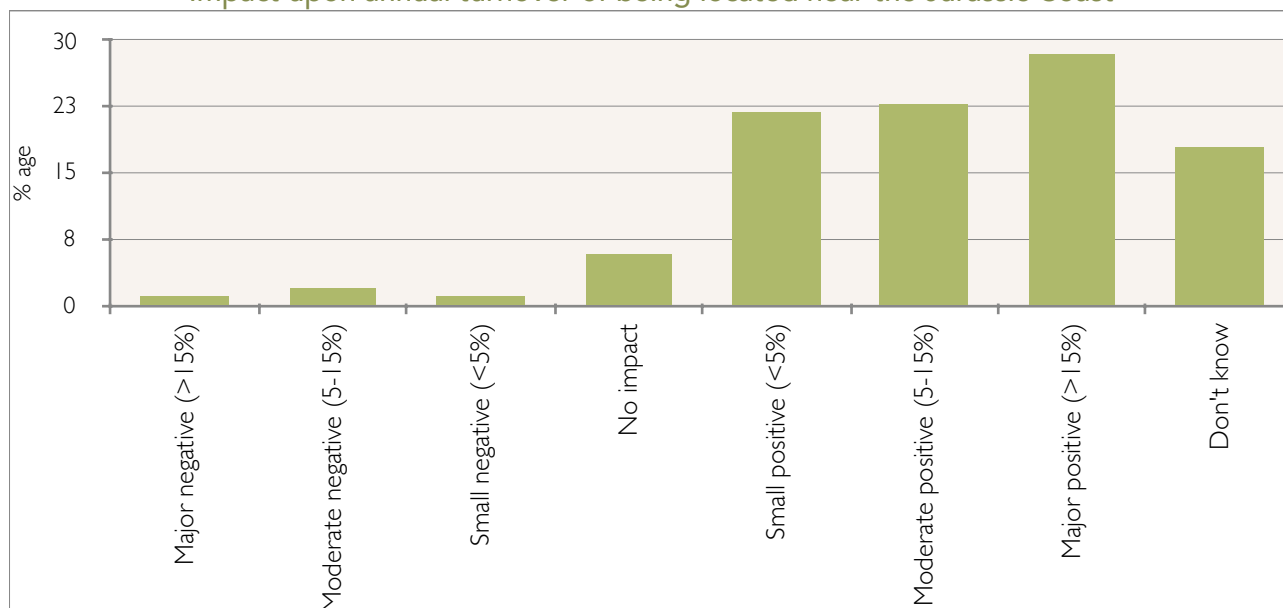


The survey asked businesses about the influence that the Jurassic Coast may have had upon their business performance - with a focus on the estimated 'uplift' provided to their annual turnover.



Of those that were able to estimate the quantifiable impact<sup>31</sup>, the average uplift for those positively influenced by the Jurassic Coast was 9.9% of annual turnover. This level of influence is higher than seen in comparator studies (for example work looking at the impact of the Antonine Wall – where businesses reported a smaller impact on their performance).

Impact upon annual turnover of being located near the Jurassic Coast



Based on the assumption that the survey responses were representative of the wider business population in terms of the influence the Jurassic Coast has and size of business we are able to estimate the aggregated impact. Again, we counter any selection bias by applying a relatively tight geographical focus, as defined at the start of this section.

We estimate that the Jurassic Coast increases business output by circa £103mn (current prices). It is important to note that this represents an annual flow of benefit and should be repeated year-on-year (dependent upon how effectively the Jurassic Coast is managed for the benefit of businesses). Recognising that this estimate is dependent upon survey data, using the estimated confidence interval provides a range of £92mn - £114mn.

The outcome of this exercise corresponds closely to the estimates relating to the benefits generated through visitor expenditure influenced by the Jurassic Coast. Firstly, by looking at the estimated economic impact through two routes this provides a level of confidence in our estimates. We recognise there is significant uncertainty in any method, but the adoption of two pragmatic approaches has led to broadly the same conclusion. Secondly, we reiterate **that the two estimates should not be viewed separately**; in some respects they are measuring the same thing in different ways. The additional visitor expenditure associated with the Jurassic Coast is captured as higher turnover/income by local businesses.

Whilst the business survey has captured benefits from some businesses that may not be reliant on the visitor economy – suggesting that benefits extend beyond the attraction of tourists – the majority of respondents to the business survey were in those sectors most reliant. As well as this, the primary benefit of the Jurassic Coast designation cited by businesses was the attraction of more visitors to the area and the associated additional income.

<sup>31</sup> Whilst 155 businesses completed the survey across Dorset and East Devon, only 87 businesses quantified the estimated turnover impact of the Jurassic Coast

#### d) Valuation of economic activity associated with the World Heritage Site designations:

The final step in considering the economic value that can be associated with the Jurassic Coast is to outline the added value that has been delivered as a consequence of the designation itself.

We cannot say with any certainty how much of the above estimate of economic benefit can be associated with the designation itself i.e. the 'World Heritage Site', or simply due to the existence of the 'Dorset and East Devon coast'. **It is highly likely that the existence of the designation itself has helped to significantly increase the scale of benefits to the area.**

To look at the added value that can be more closely associated with the World Heritage Site designation itself we look at a number of elements:

- i. **The benefits delivered as part of creating the Jurassic Coast brand.** The World Heritage Site status led directly to the creation of the 'Jurassic Coast' brand and subsequent work of the World Heritage Site team has sought to strengthen the brand, increase awareness and market the coast on the basis of that branding. Certainly, as seen from the results of the visitor and business surveys, 'brand awareness' of the Jurassic Coast is extremely high and it could therefore be argued that the brand activity delivers worthwhile added value.
- ii. **The additional funding that has been leveraged in as a consequence of the designation.** A focus in our work has been to understand how the World Heritage Site designation has helped leverage in those additional funds, and the role that the Jurassic Coast team plays in promoting and coordinating schemes.
- iii. **The direct and indirect expenditure benefits delivered as a consequence of the Jurassic Coast team being in place.** We also consider this, although recognise that these expenditure-based impacts will be relatively limited and arguably could be classified as a cost. However, it is a fundamental point to recognise that the benefits in i) and ii) above would not have been delivered without the Jurassic Coast team being in place and the real significant benefits are represented by its activities rather than associated expenditure.
- iv. We highlight the findings of the willingness-to-pay (WTP) questions contained in the visitor survey (and East Devon residents survey) and provide additional commentary on the results that helped us inform our view on the value that people attached to having the designation in place (as a consequence of the protection and conservation that it helps deliver).

#### The 'Jurassic Coast' brand

Creating a brand has been one of the key activities for the Jurassic Coast. Whilst the purpose of creating a brand has many different elements, a key focus has been to raise awareness and attract people to the area. The creation of a brand is one key area where the value of the designation can be *illustrated*. Without the time and resources devoted to building a brand then it could be argued that any branding approach would have been done in a piecemeal manner, if at all. In discussion with the World Heritage Site team it was clear that without the designation, the Jurassic Coast brand would not exist.

The Jurassic Coast brand is effectively a 'public good' which anybody – principally businesses – can use for their own purposes in stimulating additional activity. The Jurassic Coast name is not protected but the trademark logo is.<sup>32</sup>

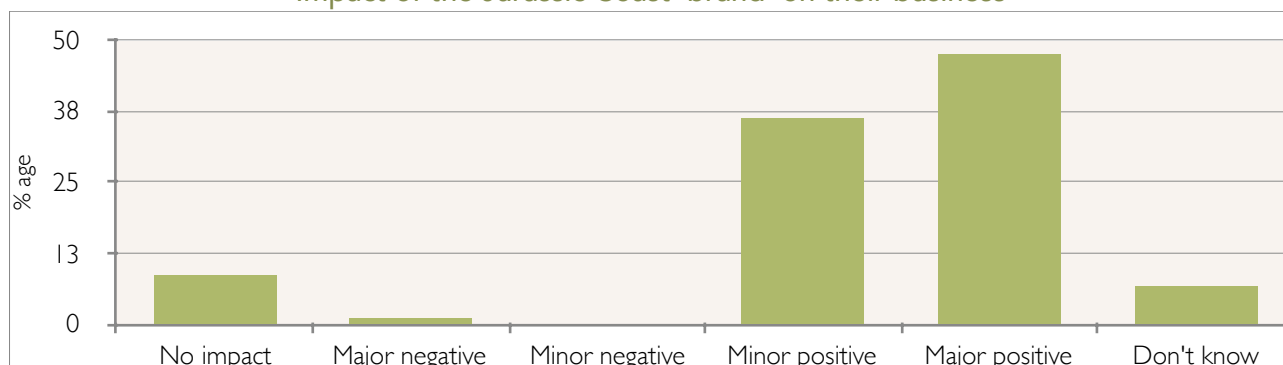
Businesses were asked to give their opinion on the value of the Jurassic Coast/World Heritage Site brand on their business. The majority of those who responded felt that the brand did deliver

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<sup>32</sup> The Jurassic Coast Trademark (ammonite logo) is legally owned by Dorset County Council, though the brand in the form of the term 'Jurassic Coast' is indeed not protected and a public good which anyone can use.

positive benefits to their business, 39% of respondents classifying it as having a 'minor positive' effect and a further 51% as having a 'major positive' effect. Only 9% businesses felt it had no impact, and 1% saying that it a major negative impact. Overall, 90% of businesses that responded to the survey felt that the Jurassic Coast brand had had a positive impact on their business. The extent of positive responses indicates the value that the majority of businesses place on the creation, development and promotion of the Jurassic Coast brand.

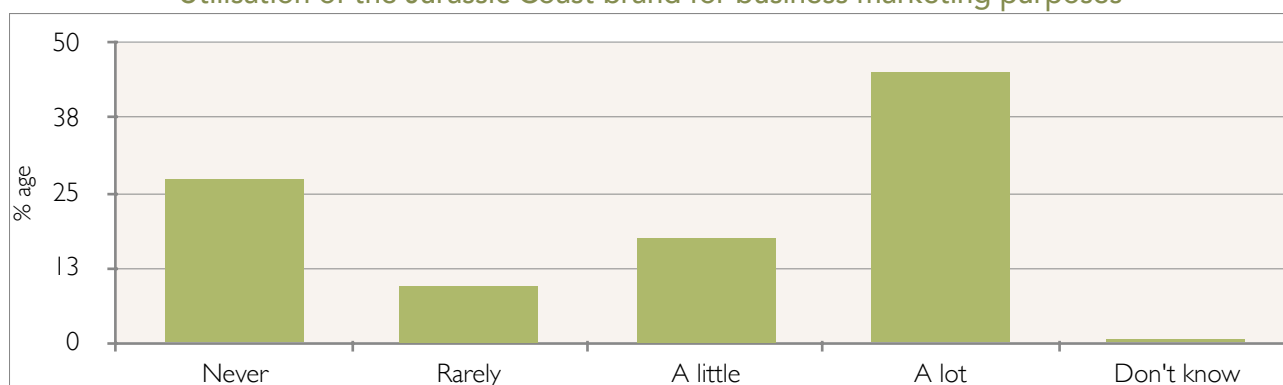
Impact of the Jurassic Coast 'brand' on their business



Through the business survey we also wanted to understand whether the 'brand' has been adopted by businesses and, if so, whether it had had a positive impact on their business. There is a difference between the benefits identified above, which relate more to benefiting from the general branding/marketing of the wider area, and those where the business has directly adopted the 'brand' in its own specific marketing activity.

Businesses were asked whether they refer to the Jurassic Coast when promoting/marketing their goods and services to customers. The results from the survey are encouraging in revealing the extent to which the brand is being adopted and utilised. Approximately 50% of those who responded to the survey said that they use the Jurassic Coast brand 'a lot', with a further 18% using it 'a little'. 27% of respondents said that they never used the Jurassic Coast brand, with 10% 'rarely' using it.

Utilisation of the Jurassic Coast brand for business marketing purposes



### Leveraged funding

Another area that highlights the added value of the WHS designation – and particularly the supporting management infrastructure – is the leveraging of additional funds beyond those that sustain that support network (as discussed later in the direct expenditure effect). There are a number of issues that are important to highlight regarding the exercise of identifying those

### Case study: Stuart Line Cruises

Stuart Lines was founded almost 50 years ago by Tony Stuart, the father of the current owner, Ian Stuart. It has been offering boat trips along the East Devon Coast and up the Exe Estuary, from its base in Exmouth, ever since. It is now the largest tourism business in East Devon - carrying about 250,000 passengers a year. During the summer season, it employs up to 50 staff directly and on contract.

Ian noticed an immediate difference to the company when the coast became a World Heritage Site status back in 2001. Firstly, it gave the company a new marketing angle and many of the general coastal cruises became focussed on the geology of the coast. Secondly, it brought an increase in demand for the coastal cruise - so much so, that a second, 200 seater boat, was bought to allow more variety during the summer. Although concentrating on the East Devon coastal towns, Stuart Lines do sometimes venture as far east as West Bay and Lyme Regis, in Dorset.

Ian is in no doubt that the Jurassic Coast designation has brought greater awareness of the area among visitors and has driven the demand for more informative trips close into the cliffs. "In the early days, the Jurassic Coast Team helped us with interpretation and the boat commentary and its work continues to raise the profile of my business." <http://www.stuartlinecruises.co.uk>



leveraged funds that can be attributed to the Jurassic Coast itself. This affects how we view the 'additionality' in a funding context.

- It is clear from discussions with the Jurassic Coast team that the primary role it plays in a funding context is to support other organisations in the area to secure funding, rather than securing large-scale funding themselves. This includes helping those organisations extract 'value' from the WHS designation in funding applications and to also ensure that activity happens in a coordinated manner. Therefore actually identifying all the funding flows that can be associated with the WHS designation would be subjective.
- The discussions also highlighted that the WHS designation can have three principle benefits in funding applications.
  - ▶ Firstly, the actual Jurassic Coast team acts as a resource that help organisations develop their funding applications (and wider project development). Of course, the teams would largely not be in place without the WHS designation and the associated revenue funding support. The level of input and support by the team varies on a case-by-case basis but the Jurassic Coast team has assisted a large number of organisations.
  - ▶ Secondly, and more intangible, is that there is a value of the WHS designation itself in terms of branding within the fund application process. That is, many funding applications will have been successful because they placed the designation at the core of their funding argument. There are examples of how the World Heritage Site designation has been used and referenced by organisations to a great extent. Many of those organisations feel that the WHS designation has been crucial in their funding success.

*"The Jurassic Coast has made a huge difference in pushing the subject of palaeontology, and as a museum that tells many stories, it's quite clear that World Heritage Site status is immensely significant. To put it in context – pretty much every funding bid starts with 'Situated at the heart of the Jurassic Coast'. We certainly wouldn't have got the initial impetus without World Heritage Site designation..... later funding bodies might have come on board because we had a clear narrative about what we want to deliver, but our early supporters got the Jurassic Coast message in its entirety." – Lyme Regis Museum*

- The third element is the additional 'confidence' that funding organisations may get from knowing that projects in those areas associated with the Jurassic Coast are being developed in a relatively coordinated manner. By having oversight of planned activities in the area, the Jurassic Coast team is able to improve coordination between projects directly (or indirectly through groups such as the JCWHS Museums Partnership) and to improve complementarity between those projects. The consequence is that projects are developed in a less piece-meal fashion.

There is also the additional element that the wider Jurassic Coast partnership structure brings. By showing that a particular project is helping to deliver objectives in the respective management plans demonstrates a wider community buy-in to that project. The World Heritage Site Management Plan goes through a comprehensive community consultation process and by showing that a particular project is helping to deliver that the Management Plan objectives means that demonstrating community support may become 'easier' in funding applications. Again, both effects are relatively intangible, and certainly difficult to quantify, but they do represent another important influence of the WHS designation.

### Direct expenditure impact

Although we recognise that the economic benefits delivered as a direct consequence of having the team in place is relatively minor in the context of the significant benefits highlighted elsewhere, this element is included in other comparator studies and we include for consistency purposes. It is useful to reiterate the point previously made – that the benefits generated as a consequence of leveraged funding, brand development etc. would certainly not be at the scale without the Jurassic Coast team driving much of that activity.

As would be expected, the economic impact associated with running the management team is relatively minor. The average annual cost of running the Jurassic Coast team over the previous 5 years equates to circa £230,000-£240,000 (broadly equivalent to £100,000 expressed as GVA<sup>33</sup>).

The majority of core costs expenditure relates to staff costs for the organisation – in the range of 80%-90% of total core expenditure. Therefore the supply chain (indirect) impact of the organisations is relatively small. There will be a knock-on benefit of wage expenditure (induced impact) from employees in the local economy; available benchmarks<sup>34</sup> show that this is approximately 0.2 of the direct impact. Therefore for the Jurassic Coast team this would equate to a further £20,000 value added in the local economy.

In terms of the impact of the core expenditure of the Jurassic Coast team, what is not known is the 'opportunity cost' of the funding support provided. All the expenditure may not be seen as additional. However, our discussions with the teams and Dorset County Council indicate that support helps to leverage in further funding and so additionality is not a significant argument in the context of the scale of benefits we have estimated being delivered by the respective teams.

### Willingness-to-pay

Although fraught with methodological difficulty, willingness-to-pay can be used as one of the proxies for estimating the value that people place on accessing an environmental asset. As previously highlighted, the average willingness-to-pay for accessing the Jurassic Coast (in the absence of free and open access facilitated by public support) expressed in the visitor survey was £4.27 per visit.

<sup>33</sup> Based on a typical turnover: GVA ratio of 0.4.

<sup>34</sup> South West Regional Accounts

Whilst a willingness-to-pay question relating specifically to the Jurassic Coast was not included in the Dorset residents survey (where the WTP question focused on the wider definition of the Dorset environment), it was included in the East Devon resident survey. Given that residents currently tend to indirectly support the Jurassic Coast through their Council Tax contributions, the WTP expressed as an annual figure seems more relevant. On that basis, the average response was a WTP of circa £37.44 per year. We assume this represents the view of household contribution.

Simply aggregating this figure across households in Dorset and East Devon gives an overall WTP of circa £9.2mn. Given the relatively small figure that is currently contributed to the Jurassic Coast from the typical Dorset household Council Tax bill (£3.93 per household) then it could be argued there is considerable consumer surplus. If WTP is a proxy of the benefit that people receive, then the individual benefits of accessing and enjoying the Jurassic Coast are significantly exceeding the indirect costs of doing so.

## 4 LOOKING AHEAD

We were asked to look at the growth potential of Dorset's environmental economy, looking at its strengths, weaknesses opportunities and threats. In this chapter, we have produced a SWOT analysis, considered against the STEEP factors that are: Social, Technological, Economic, Environmental and Political. Then we have looked at the future drivers of change and discussed how these might play out in a Dorset context. We consider the potential impacts on the County and the positives and negatives that the suggested changes might bring.

### SWOT - STEEP factors

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
SOCIAL	<p>Dorset population aware of environmental benefits</p> <p>Dorset communities value their local environment</p> <p>Dorset's special environment creates a 'Sense of Place'</p>	<p>Population resistant to change</p> <p>Some see the environment as 'someone else's problem'</p> <p>Free rider issues - it is free for everyone to enjoy, but not all contribute</p> <p>Limited understanding of the economic value of the environment</p>	<p>Using environment to promote wellbeing and fitness</p> <p>Building on the memberships of the wildlife charities</p> <p>Local communities becoming more directly involved in their environment</p> <p>Widen the use of volunteers in the countryside</p> <p>Younger population more environmentally aware and active</p>	<p>Environmental message becomes 'stale'</p> <p>Economic uncertainty and poverty reduce the importance of environment to some communities</p> <p>Population increases, due to in migration, put pressure on natural resources generally and 'honeypot' sites in particular</p> <p>Incoming population may not have as positive attitudes to the environment as our surveys have shown</p>
TECHNO-LOGICAL	<p>SF Broadband and 4G can reduce need to travel</p> <p>Renewable energy resources are plentiful in Dorset</p>	<p>SF Broadband and 4G is patchy</p> <p>Limited renewable energy installed</p> <p>Strong resistance to visual 'intrusion'</p>	<p>Improvements to digital coverage</p> <p>Using technology to improve monitoring and management</p> <p>Local smart grids and small-scale renewables</p> <p>Energy efficiency</p> <p>New technologies could reduce the need to over-exploit resources</p>	<p>Over reliance on technology in place of traditional, effective management practices</p> <p>New homes not built to highest environmental standards</p>
ENVIRON-MENTAL	<p>Wide areas of environmental protection in place</p> <p>2 AONBs, WHS, 141 SSSIs, 45 LNRs, 4 RAMSAR</p> <p>Unique, diverse and scarce habitats available throughout the County</p>	<p>Statutory controls are weak</p> <p>Lack of integration of environment into household, business and public planning</p>	<p>Using environment to create more economic activity</p> <p>Pollution and climate action promotes better river catchment management and afforestation</p>	<p>Climate change will increase environmental risks and the costs of protection</p> <p>Reduced biodiversity</p> <p>Commodification and poor trade-offs</p> <p>Extreme weather events</p>



	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
ECONOMIC	<p>Dorset's environment is a major economic resource and source of products services and jobs</p> <p>Relatively high 'willingness to pay' to access environmental assets</p> <p>Quality of environment encourages business development in new areas, where location can be irrelevant</p> <p>Job creation diversities across communities and sectors</p>	<p>Some ED organisations and businesses see it as a barrier</p> <p>Environment seen as 'free' goods</p> <p>Given other pressures, ability to pay is reduced</p> <p>Externalities still not factored in to the cost of production (environmental costs not fully reflected)</p> <p>Little 'first mover' advantage in emerging environmental technologies</p>	<p>Potential to develop new, and improve existing, sectors which utilise environmental goods and services sustainably</p> <p>Investing in environmental resources can add to growth potential</p> <p>Potential to charge for some critical eco-system services and nature benefits</p> <p>Development <i>with</i> the environment is more sustainable</p>	<p>Lack of incentives for businesses to collaborate on supporting environmental drivers</p> <p>Intense competition driving lower costs, to detriment of the environment</p> <p>Economic decision-makers not taking account of the existing and potential value of Dorset's environmental economy</p>
POLITICAL	<p>Local councillors and local residents value the environment</p> <p>Conservation ethic is strong in much of the population</p>	<p>Environmental management not seen as a priority, nationally</p> <p>Local authority budgets under pressure</p> <p>Too much short-term decision making</p>	<p>Wider political coalitions are understanding the value of the environment</p> <p>Need to find resilient local solutions may bring more support</p>	<p>'Austerity' may reduce funding to support environment still further</p> <p>Environment still not a high political priority nationally and, in some contexts, locally.</p>

### Case Study: Jurassic Skyline, Weymouth

In 2012, Merlin Entertainments, a major visitor attractions company with headquarters in Poole, Dorset, completed a new operation, called the Weymouth Sea Life Tower, to offer visitors unrivalled views of the Weymouth-Portland area and, specifically, the Jurassic Coastline. Opening was timed to coincide with the UK Olympics. Crucially, an underlying knowledge of the World Heritage (WHS) - Jurassic Coast designation was important to the firm's decision to develop this new attraction on this site.

Indeed, this year, the name of the visitor attraction was changed to Jurassic Skyline, directly taking advantage of the WHS designation in order to promote the business. Tamsin Mutton-McKnight, General Manager of Merlin's Weymouth operations, says "we wanted the name to reflect what our visitors actually see from the tower – Dorset's beautiful and historic coastline – as well as to separate it from our other activities."

The Tower employs three permanent full-time staff directly and up to another 25 people during the summer season. Its market has been growing successfully over the last three years, reaching about 150,000 visitors annually.

Since inception, the WHS designation has been vital to the business. Ms Mutton-McKnight confirms that Merlin specifically chose a site at Weymouth, over other possibilities for a viewing tower, to take advantage of the unique coastal environment offered by the Jurassic Coast. As such, it was a catalyst for starting the whole business. Moreover, the Jurassic Coast is crucial to the on going branding and marketing of the attraction.

Ms Mutton-McKnight states that the very positive effect of the WHS on the business has been well supported by the efforts of the Jurassic Coast Trust. The Trust "has been incredibly helpful with new opportunities to promote the Jurassic Coast and with other aspects of business development." As one example of the close co-operation, Jurassic Skyline has produced a mini-guide to the Jurassic Coast filled with data and insight from the Trust. In return, for every guide sold, the company makes a donation to the Trust.

This business has had a clear, direct and mutually positive relationship with the Jurassic Coast. From inception, through development, and to fruition, Jurassic Skyline has developed with the Dorset environment in mind. This foundation is expected to continue to add value for both the company and the Trust in the future. Jurassic Skyline offers a fine example of how Dorset's environment and its careful preservation, and the WHS designation in particular, can offer real development opportunities for the local economy.



## Future Drivers of Change

### 1. Introduction

The overall report, on Dorset's Environmental Economy, has taken a number of differing approaches to describing and valuing the environment within Dorset. This section is aimed at looking ahead and considering a number of issues which are likely to have substantial impact on the ecology, economy and cultural life of Dorset over the next 20 years or more. It is not intended to provide definitive statements or predictions, but more to identify key issues and trends and to explore possible consequences and impacts.

The next 20 years or so will bring profound changes in the way we live our lives, manage our businesses and plan for our communities. These changes, such as climate change, population growth, resource depletion, and biodiversity loss, will provide serious challenges and some opportunities - both globally and locally.

The section introduces the up-to-date thinking on the big issues, as well as a range of others (economics, pressure on land, communications, energy production, transport, social changes, health and wellbeing, and inequality). It then looks at what the challenges and opportunities might be for Dorset.

It does not cover any issues in depth. However, it will reference a range of papers, publications and data sources which may be useful in looking more deeply at particular topics.

### 2. Critical issues

#### Climate change

There is now widespread agreement that the global climate is changing, mainly as the result of man-made emissions of CO<sub>2</sub> and other gases into the atmosphere. Most scientists believe that we need to keep average temperature increase to 2°C, from 1990 levels. This rise, in itself, will have a number of problematic consequences - but is felt to be manageable.

The IPCC originally felt that keeping CO<sub>2</sub> levels to 450ppm would limit temperature rises to 2°C. However, the consensus is now that a figure of 450ppm will lead to dangerous tipping points in the climate and may lead to 4°C of warming. Many scientists have proposed a figure of 350ppm as a 'safe' level - a figure we have already exceeded (392ppm in 2010).

As there is little evidence that governments and big businesses are responding fast enough to limit emissions at acceptable levels, attention is turning from mitigation (prevention) to adaptation. The UN Conference on Climate Change in Paris this December has received climate commitments from 194 countries. However, scientists have concluded that, even if these were implemented in full, it would still lead to 3°C of warming - with catastrophic impacts for some countries.

The major effects of climate change are not just the potential changes to weather patterns but on the global economy, desertification, food shortages, mass migration and increased conflict.

There may be some localised benefit in the short term, from changing weather patterns, to opportunities for new types of agriculture (such as wine growing).

## Population

The exponential increase in our global population is at the heart of many of our intractable challenges. In 1950, the world's population was 3 billion; by 2010, it was 7 billion and it is forecast to rise to 9.5 billion by 2050. Of course, more people put more pressure on resources - and some consequences of population growth are over-fishing, deforestation, water shortages, loss of habitats and rising CO<sub>2</sub>. Over half the global population now lives in cities; by 2050 it will be two thirds.

In the UK, the population is forecast to grow from 61 million in 2009 to 77 million in 2050: Another 18 million people in an already overcrowded island. As they need to be fed, watered, housed, educated and employed, we can expect the pressure on land to increase and to put pressure on our natural capital. Some commentators predict mass migration from Mediterranean countries to Northern Europe, and the UK in particular - as people seek to escape from rapidly rising temperatures, desertification and conflict, due to climate change.

Some increase in population might be beneficial to Dorset as it needs to make some of its small towns more viable and balance out an old and ageing population.

## Resources

A sustainable resource is one that is not used up faster than it can be replenished. It is one where we can live off the interest rather than the capital.

Unfortunately, many of our most important non-renewable resources are being used far faster than their replenishment rate - and so they are under real pressure. Perhaps the best known is oil. Like all fossil fuels, the beds of oil were laid down millions of years ago - yet within 150 years of the first serious drilling happening, we are now believed to be past 'peak'. There is still oil in the ground but it is being extracted faster than new deposits can be found. At the same time demand is growing and the cost of extraction is rising too. This will continue to put upward pressure on oil prices.

As it is with oil, so it is with many other resources and key commodities. Fresh water, fertile topsoil, copper, uranium, phosphorus and some rare earths are approaching or past their 'peak'. Some increasingly scarce resources can be replenished, given urgent action - such as fish stocks and fertile topsoil.

## Energy

As oil becomes more scarce and, over time, becomes more expensive, and the need to decarbonise our economy intensifies in the light of climate change, we have to find new ways of creating and distributing energy. The recent fall in oil price (due to over production and reduced demand) has reduced investment in some risky exploration sites. The means to generate near-zero carbon energy are already with us - and the technologies are becoming more efficient and cheaper, and the will to install them is growing. Until the various renewable industries mature, they are likely to require some form of public subsidy. However, efficiency improvements and scale is bringing price parity with gas much closer. Fossil fuels and nuclear power receive much higher subsidies than renewable energy.

A mix of renewable technologies can provide reliable coverage (solar thermal, solar PV, onshore wind, offshore wind, wave, tidal, hydro, biomass, geothermal) at both localised and industrial scale. This will need to go hand in hand with huge improvements in energy and thermal efficiency, and more effective load balancing. Rapid improvements in battery

technology can make the intermittent nature of some renewables irrelevant. Smart grids will be developed that can cope with two-way transmission. There is likely to be higher electricity demand as transport and heating move from fossil fuels to electricity.

## Water

With changing climate and warming overall, the pressure on fresh water across the globe continues to grow. Almost 2 billion people rely on glacial meltwater to feed their water supplies - yet almost all major mountain ranges are seeing rapid decrease in glacier coverage. Upward demand from increased population, intensive agriculture and industrial uses have seen groundwater tables dramatically lowered and aquifers drained. Given the problems of finding locally practical solutions within human timescales, water stress is likely to remain a significant issue for many decades.

Parts of the UK are now regularly under water stress and new ways to store and distribute water and reduce demand are being planned.

## Biodiversity

Population pressures, over-fishing, and intensive, industrial agriculture are already leading to massive loss of biodiversity and protected environments across the world. As the loss in rainforest cover and rich savannahs increases, there are consequent threats to water management, carbon sinks and indigenous cultures.

There was a 28% loss of species populations globally between 1970 and 2008. Climate change scenarios point to an extinction of over 30% of terrestrial species if average temperature increases reach 4°C, and slightly greater loss for freshwater and marine species.

The UK has a relatively stable species population. However, as habitats come under threat from development, intensive agriculture and warming, some species are vulnerable. Climate change is likely to extend the range of many plant and animal species and so bring 'foreign' species into conflict with indigenous ones - with unpredictable consequences. Dorset is already experiencing new species of birds and insects but the impact is not yet clear.

## Land use

The global trends are clear - that more and more people are moving to cities, and that cities are becoming bigger. More than half the world's population now live in cities. While cities provide an efficient way of living, there are significant drawbacks - in density, service provision and overall resource footprint.

In the UK, there remains a desire for more personal space and for suburban and periurban living. There is emerging thinking that smaller towns may become hubs of sustainable living in the future which will demand alternative approaches to service provision, such as transport, schools and hospitals. A rising population and smaller household size is fuelling demand for new house-building.

Overall, the pressure on land is likely to increase as competing, critical uses - growing food, physical development, producing energy (non-food crops), dealing with waste, protecting eco-systems, providing amenity - vie for the best land. Managing those pressures locally will dictate how the social and environmental landscape of Dorset will develop.

## Built environment

Climate change and energy costs will drive two distinct trends in construction - one is about low impact buildings which use local material and skills to maintain the local vernacular; the other, driven by environmental and economic efficiencies, is to prioritise off-site, modular construction to the highest energy-saving levels. As the embodied energy and carbon in the construction phase takes over 40 years of use to be mitigated by even the most efficient building - research is moving to produce flexible designs which can have multiple uses over the lifetime. There will also be an increased emphasis on, and new techniques to facilitate, retrofitting of existing building stock.

These new construction techniques, and the need to retrofit, will require new approaches to planning - which effectively prioritise different things. This may prove controversial in sensitive areas like Dorset with large numbers of listed buildings. There is likely to be pressure for more house building, which will need to be accommodated as sensitively as possible.

## Economy

We have seen a sharp recession and a prolonged subsequent downturn, then a subdued recovery, within the UK and most of the developed economies. Forecasters are predicting much lower rates of trend growth than seen in the past 20 years or so (perhaps 2.25% pa, rather than 3.0%). There is still a potential for further recessions.

As the result of the economic slowdown and resultant fiscal crisis, there is a significant reduction in government spending across all areas of public service. The 'age of austerity' may last longer than initially thought, as there is little sign of global markets or the private sector taking up the slack. This has led to alternative economic models being proposed - such a circular (or cradle to cradle) economy; a collaborative (sharing resources / demand aggregation) economy and a product-as-service (paying for an outcome rather than a product) economy. There is a need to switch to a focus on 'total cost accounting' and 'total factor productivity' so that the environment can be fully internalised into decision making.

## Technology

Predicting technological leaps is foolhardy; however, there is a great deal of research happening in certain key areas. Advances in remote sensing are leading to smart infrastructure systems that can manage energy, heating, transport and access, to both balance demand and inform consumers. There is an increasing trend towards bespoke manufacture which can be distributed closer to the end-user - developing new technologies such as Additive Layer Manufacturing (ALM) and 3D printing. Battery technologies are advancing fast, with most effort going into lighter batteries for electric cars and mass storage devices to be attached to intermittent renewable generators. New techniques in molecular science and nano-technologies are driving advances in genetic manipulation, including new forms of GM crops.

## Society

The rhetoric around the Big Society is fuelling a useful debate around a range of new social trends. Further development of virtual social networks seems inevitable - whether video calls, online friendships or Second Life - but these bring worries about 'off-time'. This also leads to a blurring of what community means - when one's friendship circles are truly global, how does that affect local community cohesion? The internet is also driving new forms of community power - crowd funding, collaboration networks and peer to peer lending - which are releasing resources and finance in wholly new ways.

A great deal of work is going into the measurement of wellbeing and happiness - as more useful measures of social progress than purely economic ones. In turn, this is likely to lead to new public policies that actively promote wellbeing, and the individual responsibility for it. And, as the population ages, attitudes to health entitlements, as well as death and dying, will drive service provision and the infrastructure to support it. The positive links between nature, taking exercise and improved health is being increasingly recognised and encouraged.

## Transport

Road transport will continue to dominate mobility options in the UK and throughout the world. The basic infrastructure (roads) is widespread and easy to maintain. However, bulk movements of people and goods from city to city will increasingly rely on lower carbon methods, such as rail and shipping. Air travel is predicted to increase, though with more efficient engines.

New rail and air infrastructure is hugely expensive. So more sustainable transport efforts are concentrating on road transport. Three new fuels, or energy carriers, are likely to dominate in the production of new vehicles: electricity, hydrogen and biofuels. While they significantly reduce tailpipe emissions, there are upstream impacts at the point of energy generation. Most forecasters see electric and electric hybrid vehicles becoming prevalent, though a breakthrough in hydrogen fuel cell research may sway the balance. We continue to see vehicle emissions reducing - mostly due to weight and drag reductions in their design. Nevertheless, there will need to be a rapidly improved infrastructure to support these new technologies - for example, rapid charging points for electric vehicles.

The potential to increase public transport use will be driven by public subsidy and new financial models as a result of carbon pricing. Research continues to reduce the need to travel (fast broadband), to make the use of roads more efficient (car sharing, computerised road trains), and to reduce congestion (better planning). Dorset needs to improve the sustainable transport links westward through the County and beyond.

## Inequality

One of the strongest socio-economic trends of the last 50 years has been the alleviation of absolute poverty - but there has also been a huge increase in the relative differential between rich and poor. While there is increasing attention being paid to this issue, as seen by the Occupy movements around the world, it shows no sign of abating (in fact economic inequality in the UK is now the highest in recorded history). This despite the overwhelming evidence to show that more equal societies are both happier and perform better economically.

As resources become scarce and more expensive, one can expect social divisions and conflicts to increase. This may be exacerbated by the increase in larger, high-density urban areas. Ultimately, even within the next 50 years, we may see mass migration beginning, driven by climate change, which would put more pressure on the limited resources of the UK.

## Cumulative and integrating effects

It is important, when considering any of these critical issues, to view them alongside each other. Many have profound effects on other issues and, when taken in combination, are likely to have much more severe impacts. For instance, existing water stress areas - taken together with global warming impacts and population growth in those same areas - are likely to see increased problems of fresh water supply.



### 3. The key impacts for Dorset

This section looks at the future issues and trends that may affect the Dorset area the most - for good or ill. It also provides some local context, where this is possible.

Direct climate impacts are predicted to be warmer wetter winters and hotter drier summers. By 2050, average annual temperatures in the South West may increase by 2.5°C; rainfall may be neutral overall - though up by 17% in the winter. Some sectors may derive localised benefits from changing weather patterns. There will, however, be wider impacts from global changes in migration patterns, environmental shifts and fossil fuel prices.

Locally, there are predicted to be almost 700,000 more people in the South West by 2031 - with 30,000 more in Dorset County, and 73,000 more in the Dorset area as a whole - with the potential increase in pressure on sensitive environments and infrastructure. As the population increases and household sizes continue to reduce, there is strong pressure to build many more houses throughout the area and particularly in urban extensions and new settlements. The median age of the UK population will rise from 39.7 (2010) to 42.2 (2035). This is likely to be more pronounced in the South West and Dorset, if past trends continue.

As far as biodiversity goes, the South West has seen a significant decline in the last 50 years - in woodland, wetland and heathland habitats and in many indicator species. Three quarters of the land in the South West is intensively farmed which has led to loss of species, damage to soils and pollution. Biodiversity in Dorset has been relatively stable, largely through active habitat management. However, the pressures on some habitats (species invasion, agricultural intensification, development, greater amenity use, climate) has led to some fragmentation and pollution. Different management techniques and different planning guidelines may be required to cope with the new challenges and ensure a resilient natural environment.

While resource depletion is largely a global issue that will affect all of us, the impacts on Dorset may be severe because of the remoteness of some homes and communities. There is a need to ensure that the right infrastructure is in place to promote alternatives for energy production and fuel use, enhanced water management and transport.

New buildings may need to be higher mass, passive designs - and possibly modular in construction, to allow for a variety of uses over their lifetimes. Existing buildings may need to be retrofitted to deal with energy efficiency and heating / cooling improvements. There may be tensions within the planning system as a result of these changes.

New technologies and manufacturing techniques will provide Dorset with new opportunities for small businesses offering niche products and services. Provision will need to be made for flexible workspace and super-fast broadband in order to capitalise on the economic potential. In turn, stronger businesses and modest increases in settlement populations may keep villages and towns viable for longer.

As social bonds are weakening across the developed world, there is enormous potential for Dorset to enhance the real sense of community, rather than a virtual one. Economically, there are opportunities for shared ownership companies and community investment vehicles - while socially, boosting local culture, local events and shared celebrations can help to strengthen community ties and enhance a distinct sense of place.



Issue	Impact +/-	Potentially negative	Potentially positive
Climate Change		Changing species and habitats as climate warms Extreme weather events - heat-waves and storms Secondary effects	Extended tourist season Extended growing season
Population growth		Loss of greenfield land Increased pressure on facilities and environment	Increased sales for some local businesses Some small settlements become more viable
Resource depletion		Increased transport and heating costs	More sustainable local management could restore some stocks - eg shellfish, fertile topsoil
Energy		Need to build more small scale renewables and renew the grid infrastructure Resistance to these changes	Business opportunities
Water		Need to conserve and store water - to build more reservoirs?	Better river catchment water management
Biodiversity		More fragile habitats under threat from invasive species and warming	New species might add to overall biodiversity
Land Use		Some habitats under increased pressure Changing farm management	Potential for carbon sinks and more woodland planting
Built environment		New building designs and retrofitting required Resistance to these changes	Business opportunities Improved infrastructure
Economy		Continuing slower rates of growth	New economic models and bespoke manufacturing techniques open up new business potential Increase in day visitors benefits tourism
Technology		Renewables impacting on some landscapes and views	<ul style="list-style-type: none"> <li>• New 'smart' networks</li> <li>• Superfast broadband opens up rural areas to new business</li> </ul>
Society		Virtual social networks breaking down local cultures	Potential to actively create real community activity to enhance the rural Dorset offer
Transport		Conventional fuel costs rise for remote settlements	Electric car/bike infrastructure Flexible public transport
Inequality		Risk of rural Dorset lacking diversity	

*The table illustrates the potential positive and negative impacts of the various issues on Dorset specifically. The coloured column shows our view of the net impact (how **positive** or **negative**, on a sliding scale). Of course, the way in which global changes impact Dorset is open to discussion.*

## 4. Conclusions

None of these issues are certain to play out in any particular way. However, some of the trends are very strong and mutually reinforcing. Planning ahead for the changing realities of life in Dorset will certainly demand lower carbon means of transport, housing and energy generation.

Information technologies and the infrastructure that supports them will become increasingly important, especially in remote areas of the County. There will be a need to make more of the infrastructure resilient to storms, heat and flood. There is potential to use 'smart systems' to manage demand and supply of utilities and access.

More land may need to be allocated to support localised economies - in food, small-scale manufacture and service provision. New manufacturing techniques can support small industries that produce goods that are high value and low bulk.

The landscape and ecology of Dorset will change, and there will be the need to manage the competing pressures of conservation and development in sensitive ways. The need to produce more food may lead to tensions over use of genetics in farming. The test will be to preserve the sense of space and place, yet embrace and exploit changes that are almost inevitable.

**Note:** For reference documents related to this section, please see Annex 2

# 5 CREATING VALUE FROM THE ENVIRONMENT

## Introduction

We were asked for an assessment of how Dorset can sustainably exploit its natural assets, how the environment can be a driver of economic development and how any value can be captured.

At present, the main systems of paying for the upkeep of nature is through central government funding for environmental management (including through DEFRA agencies); through the wider spending of local authorities (unitary, county, district, town and parish); through the investment of land owners and land managers; and through resources of environmental groups and wildlife charities - such as the RSPB and Dorset Wildlife Trust. The public funding is limited, and reducing, and does not cover the costs of maintaining or enhancing the assets - whether environmental, social or economic.

This chapter discusses the potential benefits and pitfalls of seeing nature in solely economic terms. It goes on to look at potential models for capturing the value of environmental assets; and suggests how these might apply in Dorset. The potential benefits both to the natural asset providers and to the local economy are explored.

## Should nature be 'monetised'?

This section sets out some of the current arguments for and against the concept of 'monetisation'. It is not seeking to draw a definitive conclusion - just highlight the risks and possibilities.

As the political will for environmental protection is patchy, and as austerity budgets lead to declining financial support from the public sector, some in the environmental community are advocating the monetisation of nature. They argue that monetisation, by revealing the economic value of nature and its services, can heighten public awareness and improve conservation efforts. It also puts the debate on a comparable basis to the mainstream debate about the economy as a whole. Some argue that such broad calculations are not enough and advocate tradable prices for ecosystem services, suggesting that markets can achieve what politics finds difficult.

However, such an approach can reduce the hugely complex functions of Nature into commodities that are dislocated from their social, cultural, and ecological context. Others might say that the approach simplifies the complexity in a way that can encourage better resource allocation. Although the path from valuation to commodification is not inevitable, it is often seen as a slippery slope. In order to avoid commodification, the precautionary principle needs to remain at the heart of environmental policy, together with a better understanding of critical tipping points.

If one argues that conservation policy needs an economic motive to get sufficient attention from policymakers and the public, one could use two distinct approaches.

The first approach is to monetise the value of nature simply in order to reveal its immense economic contribution to society. (*This is, in essence what we have done in the earlier parts of this report.*) The value created by nature and its diverse services to humanity and the economy often goes unnoticed. By quantifying its full value, it would help to produce the political will to prevent the further destruction of nature and to facilitate its rehabilitation. This approach advocates that the best way to reveal nature's value is to present it in the terms policymakers understand: money. In 2010, the United Nations produced the first comprehensive look at the Economics of

Ecosystems and Biodiversity (TEEB)<sup>35</sup>. The UK government produced its own National Ecosystem Assessment<sup>36</sup>, leading to a White Paper in 2011<sup>37</sup>

A second approach takes such economic valuation of the environment even further, arguing that monetisation becomes more effective if there are markets to set prices for the ecosystem services in question. Markets for such commodified eco-system services would protect conservation policy from the vagaries of political will.

The line between valuation and commodification, although clear in theory, can become blurred in practice. Some environmentalists, business leaders, and policy-makers have sought to make environmental protection an economic rather than just a political issue. The introduction of “no net loss” policies, which allow economic development to proceed as long as the net acreage of a specific type of eco-system is maintained, has effected a significant shift in environmental policymaking. However, such trade-offs can ignore how interconnected biodiversity is, and can overlook the importance of nature for local communities and the ways they suffer when their ecosystems are damaged. Land-use policies based on whether a company can pay for an offset, and not on what local communities and humanity need to survive, can undermine basic rights and democratic principles.

Furthermore, separating an individual ecosystem from the complex web of nature poses a number of challenges, and particularly political ones. For example, the provision of oxygen is an eco-system service of global scale. But how do we value the contribution of individual sub-systems like a single forest to this global service? We could all still breathe if one forest is cut down, but not if all forests were cut down. At a very local scale, quantifying the value of a tree is difficult because even a single tree provides many services. Its roots provide benefits to the soil, its leaves provide oxygen, and its trunk could provide lumber or paper for industry. Equally, valuing a regional ecosystem, such as a grassland that nourishes wild animals and stores carbon in the soil, is even more problematic.

#### Case study: Activate Performing Arts

Set up almost 24 years ago, and covering the whole of Dorset and beyond from its base in Dorchester, **Activate** are a major outdoor performing arts company. As such their link to the Dorset environment is a profound one. **Activate** are a substantial local third sector organisation - employing six permanent and up to 230 freelance staff throughout the year, and operating a turnover of about £500,000 a year.



Alastair Nesbit

The links with the AONB began ten years ago when **Activate** were launching their first large scale outdoor festival. They were supported in presenting a special commission on Hambeldon Hill, which led to a greater awareness of other special landscapes in the AONB area. Soon afterwards, they joined the AONB's landscape partnership - and got involved in a plan to develop the South Dorset Ridgeway. With the active help of the AONB, **Activate** has worked closely with farmers, landowners, wildlife organisations and artists to create a new arts trail along the Ridgeway, for the 2014 Inside Out Festival.

The relationship has grown stronger as they now work closely with Dorset AONB in planning new festivals in Dorset and around the country. The mission to create extraordinary events in extraordinary landscapes works well in the Dorset context.

Kate Wood, the Executive Director, of **Activate** is full of praise for the AONB. “Dorset AONB has a team of exceptional people that has made working in the landscape possible and who have introduced us to specialists who have helped us to understand the archaeology, the history, geography and the wildlife. We have learned how to work with it and know how to invite our audiences into the landscape to experience art work that responds to the Dorset landscape.”

<sup>35</sup> *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB.* TEEB, 2010

<sup>36</sup> *Has been updated. UK National Ecosystem Assessment Follow On - a synthesis of key findings.* UKNEA/UNEP 2014

<sup>37</sup> *The Natural Choice: securing the value of nature.* DEFRA 2011

Redford and Adams<sup>38</sup> have suggested that payment schemes, if wrongly priced, also risk creating perverse incentives. For instance, if the system pays landowners to bank carbon, they may plant non-native species, or genetically “improved” trees, to bank carbon faster.

Despite the technical difficulties, embarking upon the path of valuation also changes the way we see and understand nature. In order to determine the value of an ecosystem for policy purposes, such as conducting a cost-benefit analysis for a new development project, we need to take into account all aspects of the ecosystem. The value of the whole ecosystem to society is more than the sum of its monetised parts: reducing its value to mere monetary terms, even if it were technically practical, risks stripping away its cultural and spiritual value. A cost-benefit analysis is a useful tool - provided that all the elements are properly accounted for.

For proponents, the logic is straightforward: Old-style protection of nature for its own sake has badly failed to stop the destruction of habitats and the dwindling of species. It has failed largely because philosophical and scientific arguments rarely trump profits and the promise of jobs. And conservationists can’t usually put enough money on the table to meet commercial interests on their own terms.

Society derives enormous benefit from the natural environment including clean water and air, food, fuel, pollination and the contribution of natural vegetation to flood control. Most cost benefit analysis doesn’t take account of the benefits bestowed on people and the economy by the natural environment. However, accounting for natural capital, and the ecosystem services it provides, can help manage risk and add weight to arguments for designing biodiversity enhancements.

Economics is designed to take account of natural, financial and material capital, including goods, machinery and labour. The added value of intellectual capital is also understood now and captured, to a degree, through systems such as patents and licences. There is a growing realisation among some businesses and policy makers that some (influential) economists have failed to take proper account of a third form of capital, natural capital. Many economists are comfortable with the idea that habitats and sites can have a value, with some aspects that can be monetised and others that cannot. If ecologists and economists can work together to develop meaningful values, it should be possible to influence decision making.

In fact, as we have shown in this report, the intrinsic and economic value of the environment is of such a scale that it should be acknowledged as such by economic development policy makers and it could receive a range of support from economic development organisations.

For the most part, we are advocating the first approach - of quantifying the value of Dorset’s environment; while dipping a toe into the murky waters of nature’s services as commodities. The economy and society rely on the services of the natural world. Taking account of this natural capital in economic decisions should help to make those decisions more robust.

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<sup>38</sup> *Payment for Ecosystem Services and the Challenge of Saving Nature*, Redford and Adams - in *Conservation Biology*. Wiley, 2009

## Capturing the value of nature

The rest of this chapter looks at different theoretical mechanisms that would enable environmental value to be realised, identifies those that might be viable within Dorset and, where possible, provides examples from elsewhere.

If the assets of Dorset's environment are to be maintained, even enhanced, there needs to be a way to identify the real value to the economy and wider society. If this can be done effectively, it should lead to better decisions about utilising the environment for economic and social gain and about protecting those assets from damage or loss.

There is a wealth of general literature about how to value ecosystem services, despite the fact that many are simply not given any economic value and do not feature within the economic accounts. Yet the loss of those services would create very severe economic (and other) impacts. Immediate costs might include: higher prices for raw materials, land and energy; reduced yields for food, fuel and fibres; increased operational costs; more restricted operating environment; reduced value of property and stocks; and higher insurance premiums.

### Payment for access

At its simplest, it is possible to charge for access to some parts of the environment - as a way of paying for the upkeep of and access to those areas. Many private and charitable landowners do this in order to help pay for the upkeep of the asset. It is likely that the asset needs to be attractive enough that it will bring in sufficient visitors to make a payment system cost-effective.

Another way of paying for access, by proxy, is to charge for car parking - where this is relevant. Again there would need to be sufficient income to pay for the running of a parking scheme. Care needs to be given to balance out the need for income with charging a fair price for visits of different lengths and for regular visitors from the locality. It is important that, where there is a demonstrable link between the use of a car park and the environment, a greater proportion of the charge should flow back to protecting and maintaining that asset.

A number of beaches along the Jurassic Coast already have car parks run by either the local authority, the landowner, or a local business. The differences in maintenance, pricing and proximity to the beach can drive custom towards some locations. Although there are many popular inland sites for visitors and local people, the numbers attracted to each is probably too small to warrant setting up a useful scheme which generates significant income.

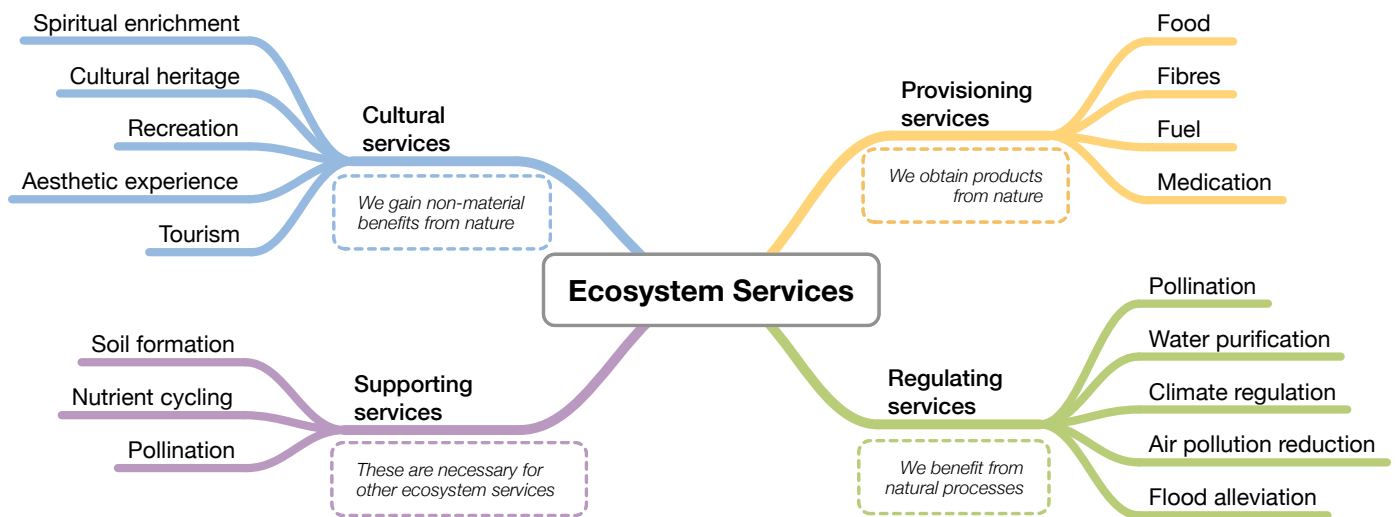
Where there have been no car park charges, it can be a source of some resentment when charges are introduced. It is important that there is good communication with the visitors about why the charges are being made and how the money raised will be used. When the Dartington Hall Trust, in Devon, introduced charges in 2013, regular users were unhappy. However, when signs were placed by the machines to explain how the car park charges would be used to offset the £1.5 million a year that it cost to maintain the gardens and grounds, opposition died away.

### Payment for eco-system services

Payments for ecosystem services (PES) is an approach which has aroused much interest. In 2012, the previous government established a business-led Ecosystem Markets Task Force, which reported in 2013<sup>39</sup>. As the report states: "the overall context for all the ideas and suggestions in this report is that we are seeing the real possibility of the emergence of a **new economy**: one that

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<sup>39</sup> *Realising nature's value - final report of the Ecosystem Markets Task Force. 2013*



fully integrates the real value of nature. The implications for this are far reaching and include the following:

- business needs to factor the real value of nature into its thinking now
- business models will have to change as pressures on nature mount, and society and governments react
- a whole new set of business models will evolve based on the Circular Economy approach
- we will need new measures and standards to help reinforce these changes
- regulators and government should support market mechanisms to help accelerate this trend
- building on its leading academic position, UK has a new knowledge economy opportunity in this field."

In agriculture, incentives have long been used as a way to influence production and, more recently to push for pro-environmental approaches to farming (CAP, Pillar 2)<sup>40</sup>. Examples include payments:

- to restore, preserve and reinforce agricultural and forest ecosystems (biodiversity, water and soil);
- to promote the efficient use of resources (water and energy) and support the transition to a low-carbon economy (using renewable energy, reducing greenhouse gas emissions, carbon sequestration and storage)

Here, in the South West, South West Water has pioneered a similar approach with its Upstream Thinking programme<sup>41</sup>. This is designed to save water treatment costs by investing in water quality improvements in river catchments. Their work with Dartmoor<sup>42</sup> and Exmoor<sup>43</sup> is also helping to restore blanket bog which is not just important for water quality but also for upland wildlife, flood risk management and as a carbon sink.

SWW estimates that water treatment costs saved could be £650 million for a £10 million investment over a 30 year period. This would involve payments to farmers to alter the management of their land for the particular benefit of an ecosystem services.

<sup>40</sup> [http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuld=FTU\\_5.2.6.html](http://www.europarl.europa.eu/atyourservice/en/displayFtu.html?ftuld=FTU_5.2.6.html)

<sup>41</sup> <http://www.upstreamthinking.org>

<sup>42</sup> <http://www.dartmoor.gov.uk/lookingafter/laf-naturalenv/dartmoormiresproject>

<sup>43</sup> <http://upstreamthinking.org/index.cfm?articleid=8699>



The Poole Harbour Catchment Initiative, which includes Wessex Water as a key partner, is aiming to reduce nitrogen and phosphorus levels entering Poole Harbour. As it develops, it is looking to plant tens of hectares of new woodland to stabilise and improve the fertility of the soil, reduce soil run off and nitrogen levels. This will prevent water quality deteriorating to unsafe levels, increase beneficial wildlife habitats and act as a way of sequestering carbon. Improving degraded wet heathland by raising water levels and creating blanket bog would also provide a carbon sequestration opportunity.

Biodiversity offsets can help move towards no net loss or a net gain of biodiversity and ensure that significant residual impacts on biodiversity are offset. A well-managed scheme should bring benefits to the ecological network by effectively pooling a number of offsets required for separate small developments into larger and more beneficial habitat blocks. They could also help streamline the planning process by reducing uncertainties of outcome and creating economic incentives for landowners to invest in conservation activities. A recent EC study<sup>44</sup> concluded that habitat banking can offer a useful additional instrument to help biodiversity policy move towards a "no net loss" objective target. Moreover, the creation of market incentives can stimulate private investment in biodiversity conservation, and facilitate economies of scale and efficiencies in delivering biodiversity offsets.

Two landscape offset schemes have recently been agreed in Dorset - for the Weymouth Relief Road and for further developments at Wych Farm. The intention has been to ensure that habitats and characteristic features of the landscape are restored. Once the right habitats have been created, then the wildlife should follow. Farmers have been paid to implement the schemes.

There are a number of national and international carbon offset mechanisms. A carbon offset is a reduction in emissions of carbon dioxide or greenhouse gases made in order to compensate for or to offset an emission made elsewhere. They generally allow individuals and companies to invest in suitable environmental projects around the world in order to balance out their own emissions. While these mechanisms have funded many worthwhile low carbon projects, they suffer from being seen to 'allow' excessive emissions rather than encourage ways to avoid or reduce those emissions at source.

If it were possible to establish a carbon offset system in a locality, such as Dorset, then local emissions could be offset locally - with a significant benefit to the local wildlife and natural habitats. It would need to be properly researched, fully transparent and local accountable. One suggestion is to approach a major national carbon offset provider to manage a local scheme within their portfolio. At its most basic, a local carbon offset scheme could result in significant increase in tree-planting and the potential to develop new areas of native woodland, with the benefits of carbon sequestration, soil management and wildlife habitats.

We have found no UK examples of payment for pollination services, though this is relatively common in California and Oregon.<sup>45</sup> However, given some of the threats to the UK bee population from disease and pesticides, there may be a way that such a scheme could work in Dorset. Those reliant on pollination, such as orchards and horticultural businesses, could contribute to the costs of maintaining local bee populations either through an offset mechanism, or directly to beekeepers.

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<sup>44</sup> *The use of market based instruments for biodiversity protection – the case of habitat banking. EFTEC and IEEP, 2010*

<sup>45</sup> <http://www.pollinator.ca/bestpractices/agreements.html>

## Payment for accessing the benefits of nature

A number of studies, experiments and projects have shown that access to nature can have beneficial effects on people's health and wellbeing. Even just being able to view greenspace can improve mental state<sup>46</sup> or work performance.

Sue Holden, then the Woodland Trust Chief Executive, said that "It has been calculated, for example, that £2.1bn of healthcare costs could be saved if everyone had access to green spaces".<sup>47</sup> Natural England have looked at evidence for the health benefits of nature<sup>48</sup>, bringing together a range of research:

- A study of town dwellers found statistically significant relationships between the use of urban greenspace and self-reported levels of stress. The results showed that the more often a person visited greenspace the less they reported stress-related illnesses.
- Research suggests that when people have good access to greenspace (perceived or actual) they are 24% more likely to be physically active. Using this figure, it is possible to generate an illustrative cost saving covering the hypothetical benefit of moving from a situation of nobody having access to greenspace to everybody having access to greenspace of £2.1 billion
- Recent analysis has questioned the effectiveness of anti-depressants as significant for mild or moderate depression. Studies have concluded that access to green spaces has a positive effect on a person's mental health and that there was further correlation of a dose-response effect for mood and self-esteem.

Consequently, some in the NHS are beginning to recommend 'Prescriptions for Nature' - essentially using NHS budgets to pay for patients to access nature, be active in nature and help to manage the environment. This is designed to result in a reduction of direct medical costs of prescription drugs and other treatments. There may be value in approaching the local Clinical Commissioning Groups to agree the principles of how such a scheme might work in Dorset.

Furthermore, there are documented benefits to disaffected young people<sup>49</sup>, offenders and those on probation in being actively engaged with nature. This might be through being exposed to wilderness or being trained in countryside skills.

The Landworks project, at Dartington in Devon, is a land-based training scheme that provides a supported route back into the community for current and ex-prisoners. In providing new skills and a supportive, yet challenging environment, Landworks is having a major impact on re-offending and is helping in the management of the Dartington Hall Trust Estate. A Probation Officer with TurnAround has said "*LandWorks is massively important in reducing reoffending - it gives stability and a sense of purpose, and improves emotional wellbeing and overall life chances. It's crucial.*"

The potential benefit with these schemes to benefit physical and mental health and support vulnerable people is to develop a clear mechanism that enables the 'managers' of the land and wildlife habitats to become directly involved in running such scheme and so gaining additional income and possibly a trainee workforce. If the NHS is to recommend that patients get active in nature, there has to be good quality nature for them to access. There is a cost to that environmental management and to creating accessible pathways - so some of the payments, from the NHS or the Probation Service, should support environmental protection.

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<sup>46</sup> Improving health and well-being independently of GDP. Pretty et al, 2015

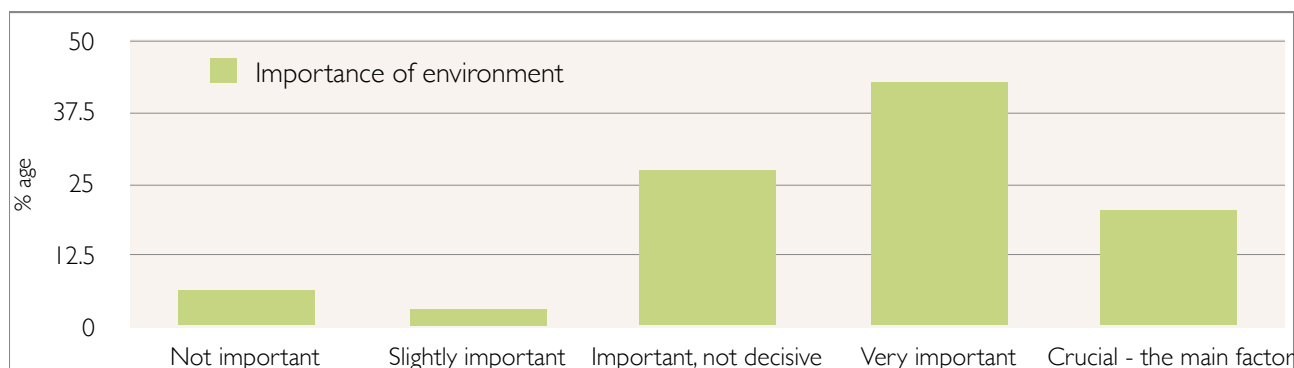
<sup>47</sup> <http://www.bbc.co.uk/news/science-environment-24806994>

<sup>48</sup> HEALTH AND NATURAL ENVIRONMENTS - An evidence based information pack. Natural England, 2013

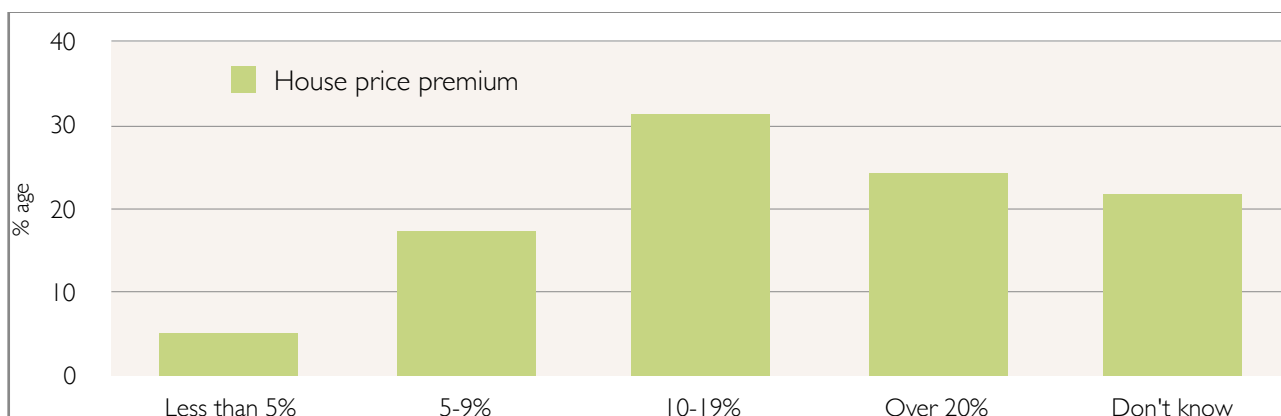
<sup>49</sup> [www.greenexercide.org](http://www.greenexercide.org)

A further way to capture some payment for being able to access nature is to develop a system of levies on those that derive the main economic benefit. Our survey work, described earlier in this report, has shown how much visitors and local people value the natural environment and how important the quality of the environment is on their decisions to live in, or visit, Dorset.

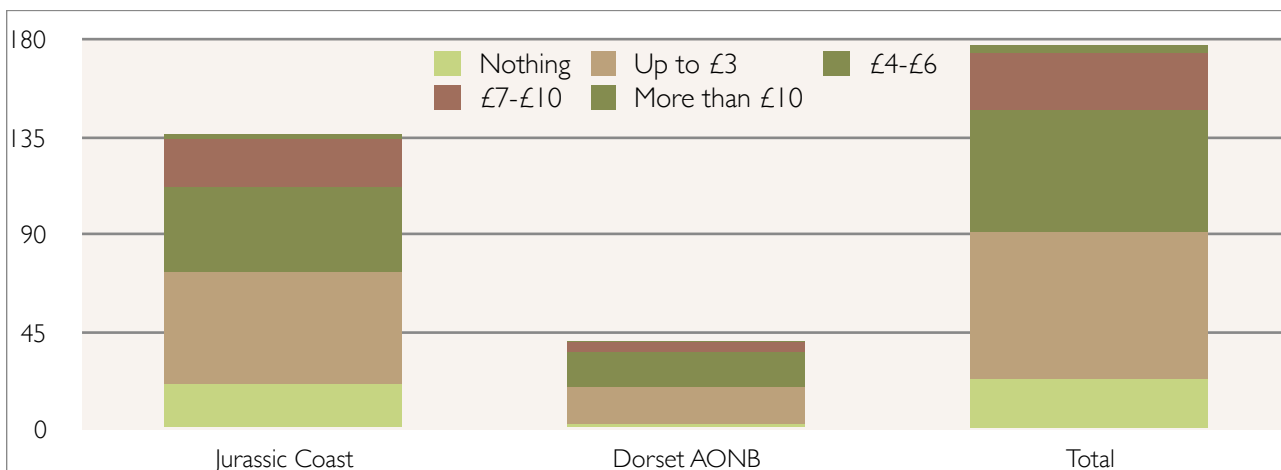
We asked residents of Dorset how important the quality of the environment was in their decision to live in Dorset. As the graph below shows, 427 of the 472 respondents said that the environment was an important, very important or crucial factor in their decision.



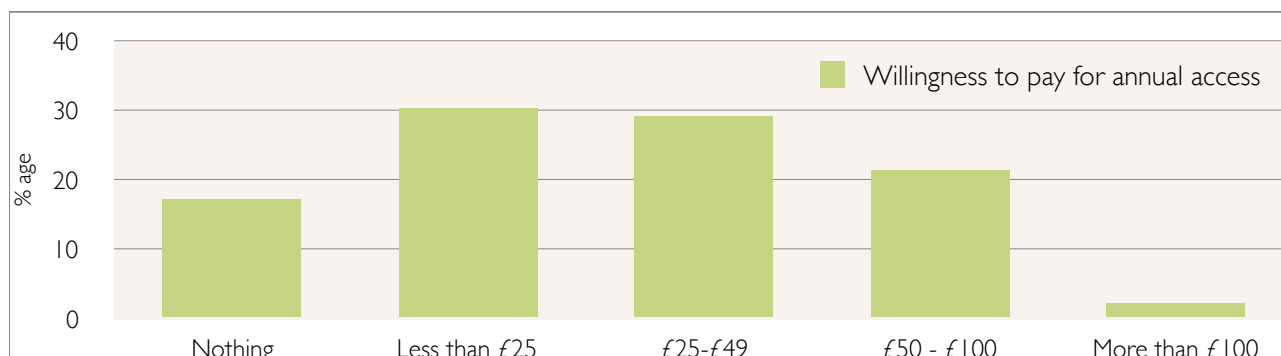
Furthermore, most householders felt that there was a price premium on their home, as a result of Dorset's environment. Of those 383 respondents, 208 thought that the premium was worth more than 10% of the value of their home.



Our visitor survey asked visitors how much, in theory, they might be willing to pay for access to special sites and beaches within the Jurassic Coast and Dorset AONB areas. A large majority would be willing to pay up to £6 per visit.



Similarly, residents were asked whether, in theory, they would be prepared to pay an annual sum for access to all the special sites and beaches within Dorset. While a large majority are clearly willing to pay something, there is a more variation as to the amount.



There are two areas where levies on the economic beneficiaries might derive substantial benefit to the wider environment, but both are likely to be contentious, at least initially.

Common in Europe, though less so in the UK, a local levy on visitors or tourism-reliant businesses (often referred to as visitor payback) can produce considerable sums to be reinvested back into the product - the visitor economy. Given that the environment is such an important part of the reason why visitors come to Dorset, such a scheme should provide additional income for managing the natural assets and enabling better access for visitors.

Such schemes can be statutory, run through the local authority, or voluntary, often run by a local tourism organisation or other agency. Bed taxes have generally been strongly opposed by accommodation providers who argue that the small increase in prices would deter people from coming to the area. Our survey evidence does not support this. Nevertheless, if a scheme was to be established in Dorset, there would need to be an effective awareness campaign to ensure a wide take-up. It is also important that any such scheme be designed and managed very efficiently so that a decent return on investment can be maintained. It could also start as a voluntary scheme, only becoming compulsory if it is seen to work.

In the Lake District, a voluntary scheme is run by Nurture Lakeland<sup>50</sup> with the support of the National Park Authority and the Tourism Association. It encourages local tourism businesses to fundraise for landscape conservation - and has raised over £1 million over the last 18 years - and to operate more sustainably. The Jurassic Coast Business Partner programme<sup>51</sup> offers similar benefits, but charges a fee to the participating businesses - who then recoup that cost via customer giving schemes or fundraising events, or make the donation themselves.

There has been a slow take up within the UK of Tourism Business Improvement Districts (TBID), first pioneered in the USA. These build on the idea of Business Improvement Districts, introduced in 2003. According to Visit England: "a TBID is broadly similar to a BID but is designed to directly and specifically support the development of the tourism sector within a destination rather than a cluster of businesses that share a common trading environment.

As in the case of BIDs, the scope of the work programme emerges through an in-depth consultation process that takes place before the ballot, between the TBID proposer, and those businesses and organisations that may have a stake in the TBID as beneficiaries of the increased business levels that the project aims to generate.

<sup>50</sup> <https://nurturelakeland.org>

<sup>51</sup> <http://jurassiccoast.org/get-involved/business-partners/832-become-a-jurassic-coast-business-partner>

TBID programmes, which will be locally determined, are likely to fall into five categories:

1. Sales and marketing campaigns such as advertising, PR, field sales and online marketing.
2. Research such as customer research, business trends, and brand mapping.
3. Business support such as technical advice, training and networking.
4. Tourism services such as visitor services, festivals and events, guiding and information.
5. Capital investment to fund infrastructure projects.”<sup>52</sup>

Parts of the Jurassic Coast might lend itself to such a scheme, with the potential of a proportion of the money raised being spent on the environment - as per the 5th category above. It might be more difficult to implement along the whole 95 mile stretch of coastline.

One further mechanism, which would need to be designed to complement existing Planning mechanisms such as Section 106 arrangements or the Community Infrastructure Levy (CIL), would be a levy on the sales of new housing. Our surveys show clearly that there is a house price uplift because of the quality of the Dorset environment in general and the designations in particular. However, as residents often only realise this increase in asset value when they sell their home and move away from the area, the value is lost to the area. The one time when the additional value could be captured is when new homes are sold.

We recognise that an additional levy on new housing could produce market distortions and might be controversial. Such a payment could be raised from either housebuilders or, perhaps, estate agents. It should be possible to test whether agents were willing to ‘donate’ a flat fee or proportion of takings on sales. Housebuilders might argue that they already pay a price premium through the price of land; and that they contribute to the locality through S106 and CIL in any case. Nevertheless, it should be possible to argue a strong case that a proportion of CIL and S106 payments be applied not just to the immediate local area of any new housebuilding, but to the wider area that helps to drive the house price premium. At least the wider natural environment could be considered as part of the infrastructure and receive a proportion of payments, to be agreed.

### Public Sector Support

The main sources of support for care and management of nationally important environmental assets are direct grants from national and local government. Natural England, the Environment Agency, the National Parks, Areas of Outstanding Natural Beauty, RAMSAR sites, World Heritage Sites and many others benefit from direct support for much of their activities. However, in recent years, reductions in central government funding both directly and via local authorities has put some of the most sensitive natural sites at risk. As an example, the National Parks have suffered a reduction of core funding from government of between 35% and 40% over the past 5 years<sup>53</sup>. The recent Autumn Spending Review shows that DEFRA is facing cuts of almost 13.6%, on top of significant cuts in previous years.<sup>54</sup> This has had an inevitable impact on service delivery and many treasured schemes have been closed altogether and some authorities have lost a third of their staff. In a similar way, several cash-strapped local councils are cutting back on support to AONBs in their area - as other statutory services are deemed to take priority.

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<sup>52</sup> *Introducing Tourism Business Improvement Districts in England. Visit England, 2011*

<sup>53</sup> *Impact of grant cuts on English National Park Authorities. Campaign for National Parks, 2015*

<sup>54</sup> <http://www.telegraph.co.uk/finance/autumn-statement/12007175/Autumn-Statement-2015-How-will-government-departments-fare-under-George-Osborne.html>

These reductions in public sector support have led many environmental management organisations to search for other ways to generate income for their activities.

The UK National Ecosystem Assessment points out that that European and government subsidies for agriculture, energy and fisheries sectors have expanded and intensified production at the expense of the provision of environmental and social services not valued by markets. Reform of these subsidies that have caused unintended consequences could be an effective means of delivering more sustainable water and land management. Similarly, well designed environmental taxes and other economic instruments could play a role in ensuring that prices reflect environmental costs – in line with the polluter pays principle – and discouraging behaviour that damages the environment.

In theory the European Common Agricultural Policy (CAP)<sup>55</sup> has a key role in promoting biodiversity and the preservation and development of 'natural' farming and forestry systems, and traditional agricultural landscapes; better water management and use; ways to deal with climate change. However well intentioned, the EU agri-environment schemes have not stopped pollution of river catchments, fragmentation of habitats and loss of wildlife<sup>56</sup>; though there have been individual successes in some locations.

It is worth noting that the Dorset AONB have been successful in supporting farmers to access environmental stewardship grants and other environmental payments.

Although carbon taxes and carbon trading schemes have not yet been implemented at scale in the UK, there is great potential that, as those type of regimes become more common, some of the proceeds could be allocated to key types of environmental management - and in particular carbon sequestration measures. These might include tree-planting schemes or projects to protect blanket bog and other habitats that store carbon in the soil.

### Support from the public

The public have shown themselves willing to support a wide range of environmental activities, ranging from habitat enhancement to wildlife preservation. Environmental charities in the UK benefit from tens of millions of pounds worth of support. Some support international efforts to directly deal with, say, rainforest loss or marine ecosystems; while some supports campaigning and policy work to deal with the root causes of the environmental problems. Nearer to home some of the charities with the greatest membership in the country are concerned with wildlife and nature. The RSPB, the Woodland Trust, the county-based Wildlife Trusts and the National Trust all benefit from millions of members paying annual membership fees. These fees go directly into preserving and enhancing critical habitats and supporting wildlife. In Dorset, these organisations own and manage a number of important non-statutory sites (see map below). Environmental charities also raise substantial sums through special appeals, legacies and other voluntary contributions.

Whether it is possible, or wise, for the Jurassic Coast WHS team or the Dorset AONB to try and build a public membership scheme in a similar way is a matter of opinion and could conflict with operational relationships with wildlife charities, such as the Dorset Wildlife Trust. In practice, the Jurassic Coast World Heritage Site operates a Friends of the Jurassic Coast and an Ambassadors scheme to build up relationships with local people. There is also The Jurassic Coast Trust<sup>57</sup> which raises money to help people understand and enjoy the WHS.

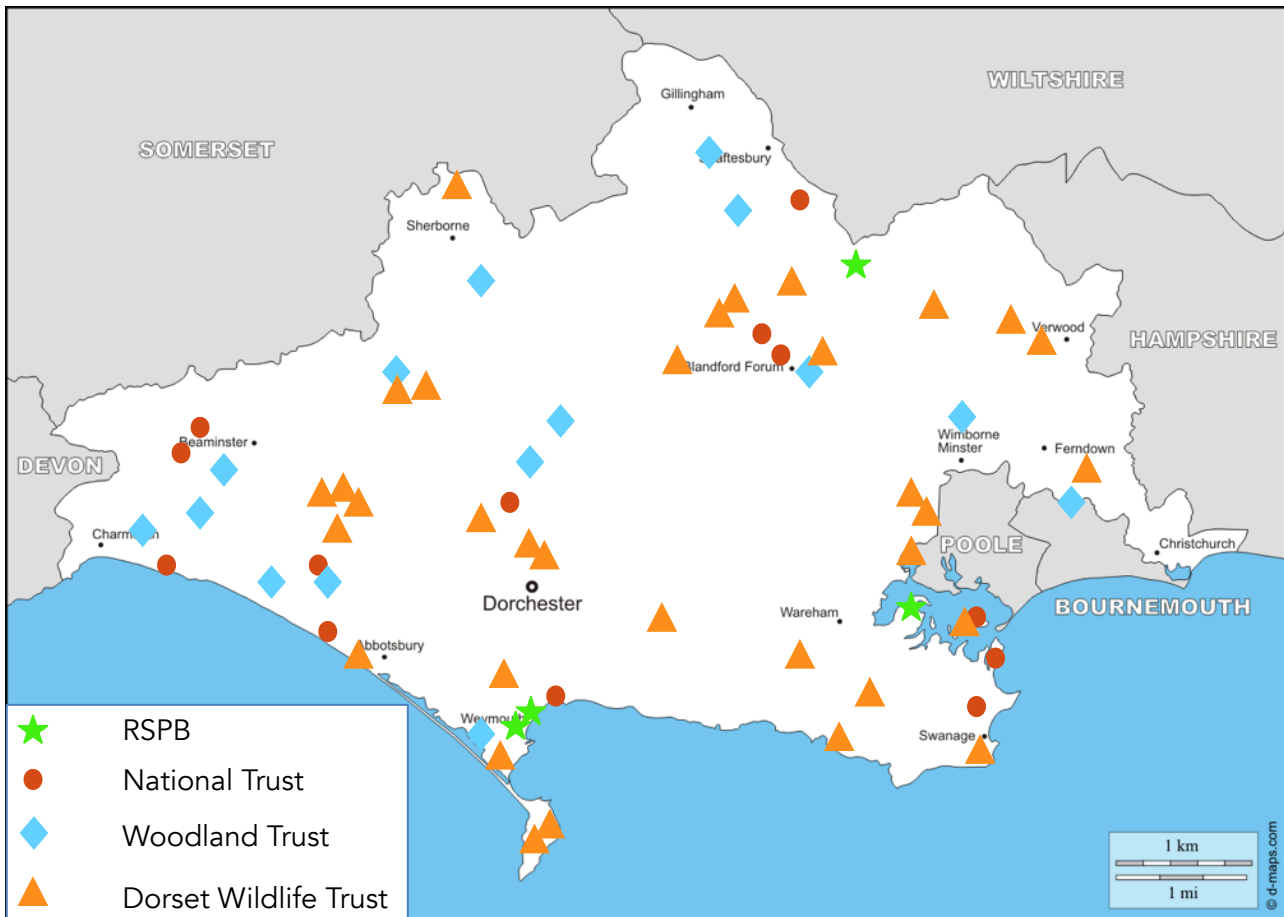
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<sup>55</sup> [http://ec.europa.eu/agriculture/envir/measures/index\\_en.htm](http://ec.europa.eu/agriculture/envir/measures/index_en.htm)

<sup>56</sup> *Bringing Ecosystem Services into Economic Decision-making: Land Use in the UK.* Ian Bateman et al. *Science*, 2013

<sup>57</sup> <http://jurassiccoast.org/get-involved/the-jurassic-coast-trust>

### Major natural sites in charity ownership



In different circumstances, the public has also proved willing to support particular appeals, especially in local areas. Of course the potential market for such appeals is beyond the borders of Dorset and should reach out to ‘Dorset lovers’ wherever they are. A range of mechanisms can be deployed to capture the public’s support for special places and special wildlife habitats. Community bonds or shares<sup>58</sup> are now a relatively common way of raising funds for the preservation of public buildings, to take over the running of local resources and set up green energy projects. Essentially they provide a way of raising investment capital from local communities and they are generally expected to make a return for the investors.

The limitation for environmental projects is that few can generate returns. However, it might be possible to raise this sort of investment for new woodland projects, or to buy land for mixed use schemes that could support green infrastructure, or to develop community gardens or agriculture schemes. The Wessex Reinvestment Trust Group, which owns Wessex Community Assets,<sup>59</sup> operates in Dorset and aims to support communities in owning assets that are important to them.

In some circumstances, the use of Social Impact Bonds (SIB) by local authorities may enable environmental organisations to manage ‘payment by results’ projects - where the payment is for outcomes rather than inputs. This tends to support activities that encourage prevention of social or environmental damage and more joined up delivery. Payments for the management of river catchments might be an example where SIBs could provide new forms of investment. Government departments, the Big Lottery and others<sup>60</sup> have funds earmarked for improving outcomes in this way.

<sup>58</sup> <http://communityshares.org.uk>

<sup>59</sup> <http://www.wessexca.co.uk>

<sup>60</sup> *Directory of SIB Service Providers. Social Finance, 2015*



There is potential to explore the use of different crowdsource funding mechanisms to support the delivery of particular environmental projects, and where public support is likely to be high.

### Creating markets for green goods and services

Finally we turn to ways of improving the local economy by managing environmental assets and developing 'green' markets for Dorset-based businesses. In doing this, we will consider the potential for markets that utilise natural assets directly and those that might benefit from the existence of those assets.

#### Woodland

Properly managed, Dorset's woodlands and hedgerows are an environmental asset that can provide a wide range of economic, social and environmental benefits. They can improve biodiversity, capture carbon, provide incomes for local businesses and offer pleasure to local communities.

There are already a number of initiatives in Dorset that are developing that potential. For example, the Dorset Energy Partnership's woodfuel project, which would, if funded, be delivered through the AONB's Woodlink project.

In order to maximise the economic returns alongside the environmental benefits, there needs to be a shared plan, which builds on the 2007 Dorset Trees, Woods and Forest Strategy<sup>61</sup>. This should look at how to extract every bit of value from woodland management and keep that value within Dorset, as far as possible. One of the key aims should be to promote the local use and local processing of this local product. Whether for construction, furniture-making, woodfuel - or to attract visitors and provide prescription pathways - the local economy can benefit from this small, but important sector. In Devon, it is estimated that the sector is worth £4 million and sustains 75 jobs.

However, the economics of the wood chip industry might demand a greater scale than Dorset itself can generate. It may be advantageous to create partnerships with neighbouring areas (such as Devon and Somerset) to build a strong and resilient supply chain. Also, the sector requires sustained investment, given the timescales involved, to realise the shared aims of improving habitats, increasing jobs and incomes, better woodland management and attracting visitors.

#### Energy

As with most rural areas, there is potential to generate renewable energy using the abundant natural assets - sun, wind, water and geothermal. The key issue for Dorset, and the designated areas, is how to balance the urgent need for more renewable energy to counter climate change and make the locality more resilient, with the desire to preserve the special landscapes within the County.<sup>62</sup> Climate change is widely accepted as the most significant long-term threat facing the natural environment.

Latest polls show an overwhelming majority of the British people support renewables of all kinds. A recent Gokarna poll, for Good Energy<sup>63</sup>, shows that 76% support solar, with only 4% opposed; while 59% support onshore wind, with only 8% opposed. And the need for more renewables is critical, especially as the world is meeting for crucial climate talks in Paris this December, amid the

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<sup>61</sup> *Dorset Trees, Woods and Forest Strategy. Dorset AONB, 2007*

<sup>62</sup> *Guidance for Wind Turbine Development in the Dorset AONB. Dorset AONB, 2012*

<sup>63</sup> <http://www.goodenergy.co.uk/press/releases/2015/08/05/new-survey-shows-strong-public-support-for-renewable-energy>

recent findings that we have already reached 1°C of warming (from pre-industrial levels). A presentation by the Institute of Chartered Engineers, in 2008, identified that the South West could theoretically produce 109 TWh from all forms of renewable energy by 2030 to meet projected demand of 160 TWh.

Despite the immediate uncertainties caused by a sudden change in the support mechanisms, the future for renewables is huge and Dorset could be a significant player in this market. Every suitable roof could be producing electricity, and technologies for solar PV are continuing to improve; small scale wind could be embraced without affecting landscape views; commercial solar could be encouraged in some areas; geothermal may need support to develop its potential; the woodfuel sector is growing and small-scale hydro could be viable in some locations.

## Food

Dorset already has an effective Food and Drink project, managed by the Dorset AONB. In common with many other rural areas, much of the landscape of Dorset is shaped by farming. Food production and processing is an important part of the economy.

Most of the food eaten in Dorset is shipped in from other parts of the country and from across the world. And most of what is produced in Dorset is shipped out to the supermarkets and other bulk customers. This is despite the fact that Dorset farmers produce a wide variety of quality meat, dairy, grain, vegetables and fruits which could be appearing on the tables of Dorset homes, restaurants, schools and hotels.

The New Economics Foundation has estimated that every pound spent on local food can have a multiplier effect, making it worth £2.50 to the local economy<sup>64</sup>. Food that is produced for local markets tends to be farmed in a more sustainable way and with less impact on the natural environment. Local, small producers, who tend to be most interested in direct sales, tend to be those with strong environmental sympathies affecting their land management choices.

There are no shortage of food great projects in Dorset. The Dorset Urban Food project, Shaftesbury Home Grown, Communities Living Sustainably (CLS), Food Future Bridport, the Dorset Food and Health Trust and so on. They all promote different aspects of local, community and natural food production.

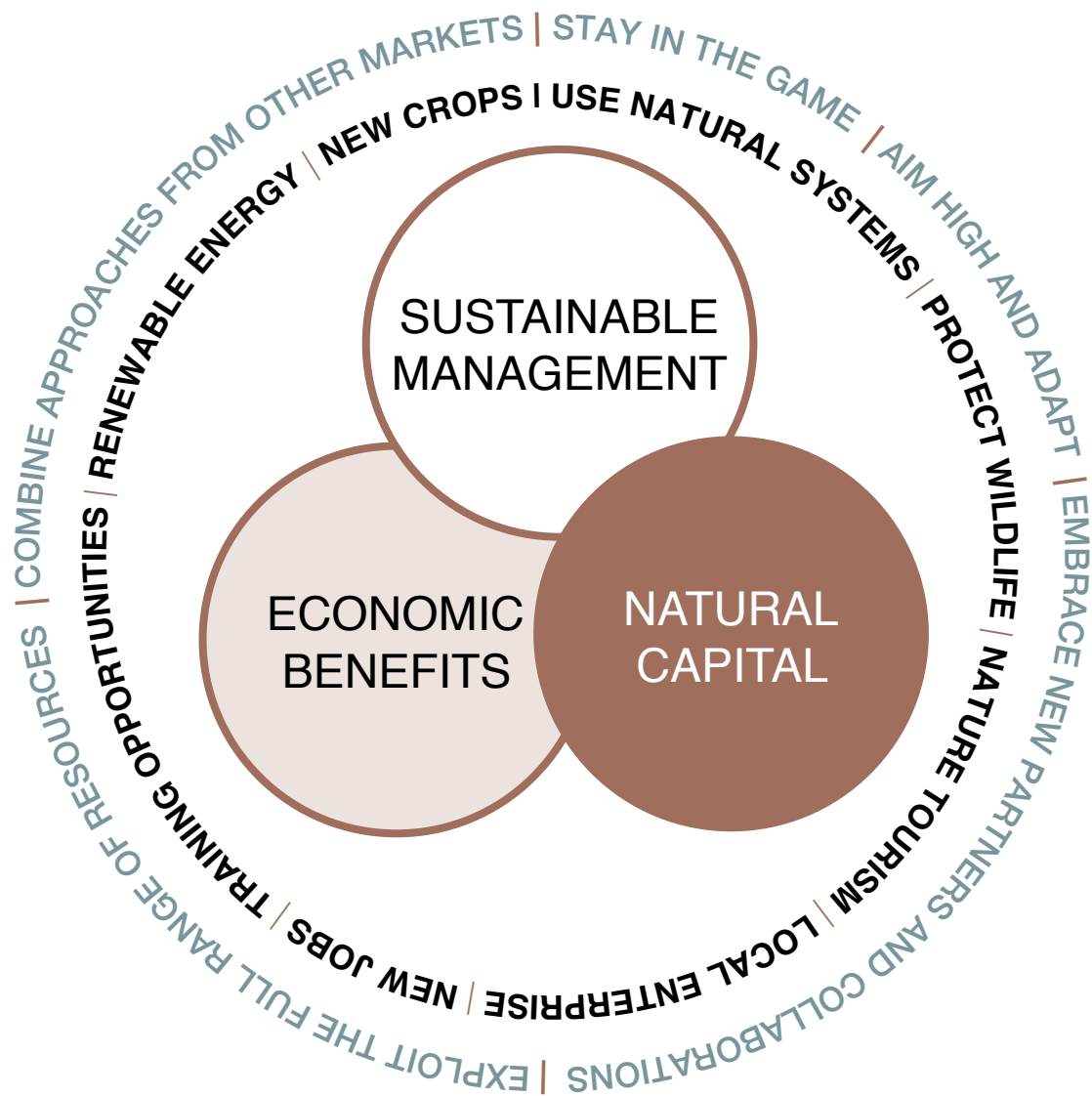
While many Dorset products are widely recognised, the Dorset food 'brand' itself is not well known outside the County. However, there is the potential with more ambition and coordination, to create a Dorset-wide food project which operates at a much larger scale (to keep costs low) and with a clear set of quality and nature standards (to maintain trust in the product).

The benefits are clear - promoting local wealth, building community networks, preserving biodiversity and ensuring affordability. Farmers, environmentalists, tourism businesses and councils will need to come together to support such a scheme and to ensure both a quality product for the consumer and a fair deal for nature.

It would be possible provide locally-sourced, seasonal lunches to our schools - like the Local Food Links project in Bridport. More growers could get a fairer price for their produce from local consumers rather than the big retailers. The landscape could be enhanced by using less intensive, nature friendly farming methods - building on initiatives such as the Pasture Fed Livestock Association.

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<sup>64</sup> *Local Food: The Facts. CPRE*



Linked to this, is a growing market for food tourism - building on the reputation of food and drink producers, celebrity chefs and great restaurants.

#### Nature-based tourism

Dorset is already a significant tourist destination - capitalising on the coastline, the local heritage and the varied nature. However, the offer to visitors could be more contemporary, more quirky and more joined up. Whilst enjoying the natural environment, new metropolitan visitors also expect the highest levels of service and value, yet in a relaxed and authentic way. The tourism offer needs to respect and enhance local nature, culture and heritage.

There is also an increasing demand for organised access to nature, for wildlife safaris (the crane safaris on the Somerset Levels are hugely popular<sup>65</sup>) and for active and adventure sports. These can provide enterprise opportunities locally and can be managed in a way that sustains and support natural habitats. Dorset's special landscapes - heathland, rivers, grassland, woodland, wetland, coast and farmland - offer opportunities for visitors to experience amazing wildlife up close, be it otters, hares, rare birds and special plants. While there are already a number of wildlife tour companies, such as The Travelling Naturalist, there may be opportunities to grow this niche.

<sup>65</sup> <http://www.thegreatcraneproject.org.uk/blogs/michael-wilson/crane-safaris-0>

It is important to ensure that as much value as possible is kept within the local economy by offering ways for visitors to spend money with local companies - whether for transport, accommodation, or catering.

### Environmental Enterprise Zones

Building on a concept promoted by Prof Tim O’Riordan, from University of East Anglia and Mark Robins<sup>66</sup>, the notion is to create special areas where environmentally based businesses can benefit from particular support - to improve their economic prospects and maximise broader sustainability outcomes. They would also be expected to produce specific environmental, or sustainability benefits.<sup>67</sup> They could be endorsed by government, just as Enterprise Zones are at the moment, and so enable business rate relief and enhanced capital allowances for companies located within them. With a new bidding round coming up<sup>68</sup>, the LEP and local authorities have the opportunity to support environmental sectors through this mechanism.

Alternatively, the solution could be a local one where the local government and local agencies agree to provide what support they legally can to help grow sectors which depend on the environment. Much like a Tourism Business Improvement District (discussed above), an ecological enterprise zone could help the key sectors to build their capital base, improve marketing and supply chain initiatives and access technical support.

The key to developing new markets and strengthening existing ones is to remain open to innovation (often from other sectors) and to collaborate to create increased shared value. Natural systems can and do support livelihoods and enterprises but they can be managed more systematically to generate economic benefits alongside all the vital environmental services that they offer. The public and private sectors can help to bring about bigger market opportunities - creating new knowledge networks, providing support to emerging enterprises and building a supportive enterprise environment.

### Support from the Dorset Local Enterprise Partnership (LEP)

The local LEP should be encouraged to recognise the full potential on the environment as a vital asset for the wider economy, as a sector in its own right and its role in creating success in other sectors.

Nevertheless, its Strategic Economic Plan has identified some areas<sup>69</sup> where it is aiming to support activities which could be leveraged to support the improved protection and enhancement of the natural environment. It should also be possible to have a dialogue with the LEP to enable environmental benefits to be developed, and environmental damage to be limited, from their other activities in supporting the mainstream economy.

In particular, the Plan highlights the renewal and diversification of the tourism sector. While not clearly acknowledging the critical role of the environment in attracting visitors, the plan does set out a number of landmark projects along the Jurassic Coast: Destination Portland; Jurassic Coast Studies Centre; Jurassica; and the MEMO Project.

The Plan does acknowledge the importance of rural Dorset and the value of the natural assets. *“The quality of the environment gives the area a competitive advantage attractive to businesses, employees and visitors. It is also a source for direct and indirect jobs, and offers real potential for*

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<sup>66</sup> *Making the case for Ecological Enterprise Zones.* Tom O’Riordan and Mark Robins, 2013

<sup>67</sup> *The Paradox of Green Keynesianism*, Molly Scott Cato MEP (in *The Post-Growth Project*). Green House, 2014

<sup>68</sup> <http://enterprisezones.communities.gov.uk/opportunities-places-benefit-enterprise-zones-boom/>

<sup>69</sup> *Transforming Dorset: Strategic Economic Plan.* Dorset LEP, 2014

*new and sustainable enterprise and economic growth. It is important to both harness and conserve the assets of the environment to deliver economic growth."* Yet it fails to offer any support to maintaining those assets either for their own sake or for future economic development.

Energy goods and services are a sector which is recognised in the Plan as ideal for local support as "to meet the UK's tough targets there will be a huge demand for renewable energy". Currently employing around 3,500 people and contributes £173m to Dorset's economy, the sector has a number of locational advantages which the LEP is seeking to exploit - in biomass production, waste to energy, wind technology manufacturing.

This report identifies the overall value of the environment to Dorset's economy; it shows the economic impact of the Jurassic Coast and AONB; it identifies a number of ways that financial support could be forthcoming to support environmental work; and it identifies potential markets for 'green' goods and services. The evidence is clear - the environment creates significant economic value and jobs and will be crucial in maintaining economic potential in face of future threats. A dialogue with the Dorset Local Enterprise Partnership should identify new ways in which the LEP can channel support to the environment sector and help to release even more value for the wider economy.

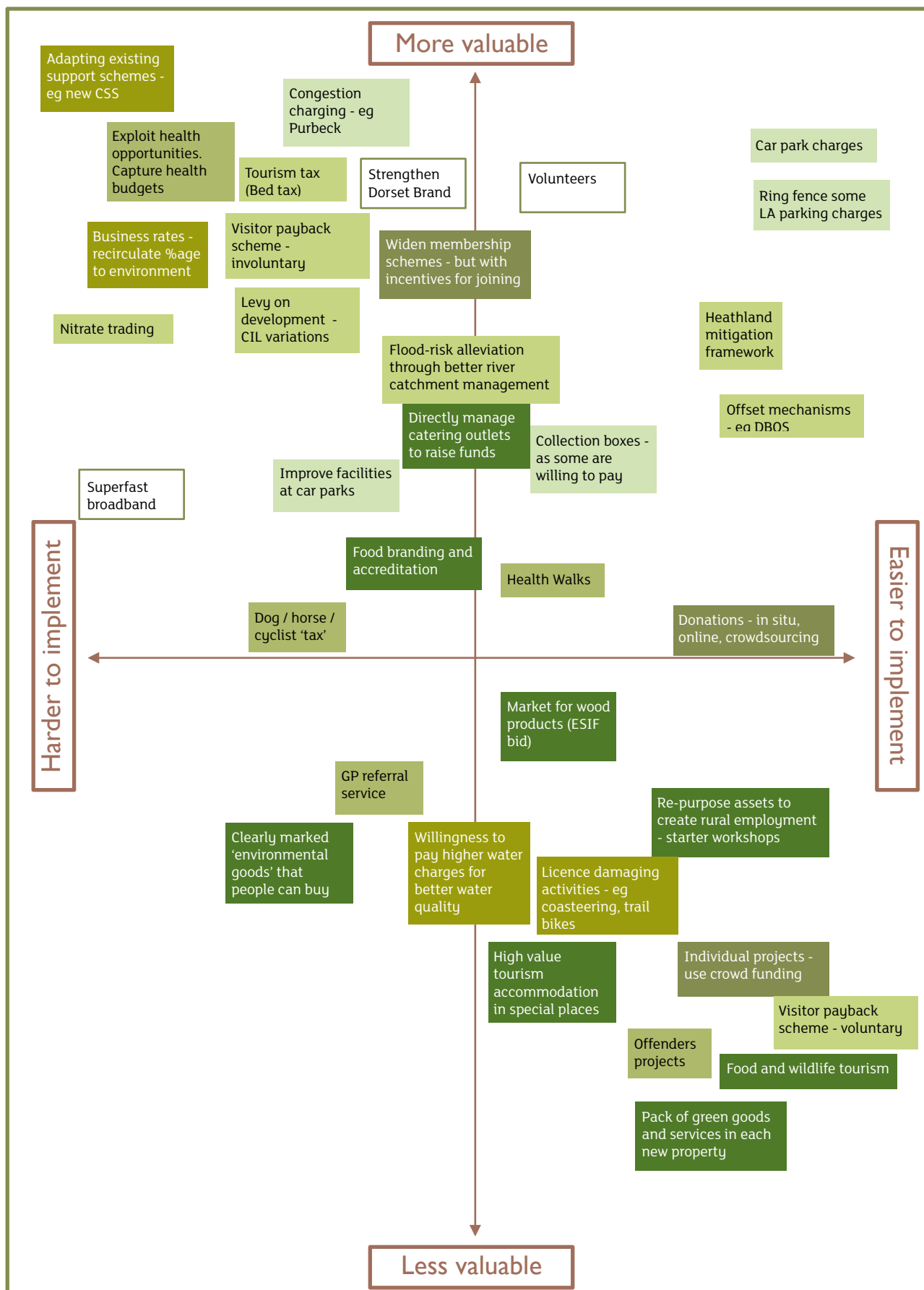
Type	Examples	Description	Location applicable	Good practice
<b>Paying for access</b>	<b>Entrance fees</b>	Simple charge for visitors on entering a site or certain land. Needs to be an effective mechanism for ensuring the charges support the area being accessed. Could be voluntary contributions	Need to be enclosed spaces, in single ownership. Not public access land.	National Trust
	<b>Parking charges</b>	Simple charge for visitors to park close to, or within, popular places. Needs a mechanism whereby the surplus is spent on maintaining the environmental asset. Communication about how the money is spent is valuable.	Needs to be a popular venue to make the costs associated worthwhile. More appropriate for coastal venues.	Beach car parks Mudford Quay Dartington Hall Trust
<b>Paying for ecosystem services provided</b>	<b>Offset mechanisms</b> -carbon -biodiversity -landscape -tree planting	Mechanisms whereby those who cause carbon emissions, or want to develop sensitive land, make a payment to compensate elsewhere.	More local benefit if linked to local places, such as Weymouth	Weymouth Relief Road RSPB / Bristol Port offset at Steart Point
	<b>Water</b>	River catchment management encourages an holistic way of looking at the whole water system, with all of the stakeholders. Often supports better farm management, reduction in pollution levels and flood management.	Poole Harbour (Frome and Piddle) Catchment All Dorset river catchments	SW Water Upstream Thinking / Mires projects Poole Harbour Catchment Initiative
	<b>Pollination</b>	Potentially a way to support fragile bee populations by paying for maintaining bee conservation.	West Dorset orchards	Pollination agreements, such as used in California and Oregon

Type	Examples	Description	Location applicable	Good practice
<b>Paying for the benefits of nature</b>	<b>Levies and voluntary agreements - eg on bed spaces or new housing</b>	The potential is to charge, those whose businesses benefit most from nature, a small levy which can help preserve the asset they depend on. Schemes can be compulsory or voluntary. Need to factor in the management costs of scheme.	Accommodation businesses, possible restaurants. Need to decide if across the whole of D,B and P - or restricted to JC and AONB areas.  New settlements and town extensions, esp if on green belt , eg Wimborne	Nurture Lakeland (visitor giving) Catalonia Tourist Tax Tourism Business Improvement Districts
	<b>Prescriptions for nature</b>	Clear evidence that there are health benefits from exposure to the natural environment. NHS can make payments directly, or via prescriptions, to support natural projects and save on traditional medicine	Primary Care Providers Clinical Commissioning Groups	Natural Choices in Weymouth and Portland
	<b>Ex-offenders</b>	Potential to reduce re-offending rates and build new skills through work within the environment	Woodland management; building access; traditional skills; interpretation Local Gaols	Landworks, Dartington YOI/AONB Portland Project
<b>Public sector support</b>	<b>Carbon pricing</b>	A way of taxing carbon emissions, particularly those arising from the use of hydrocarbons. Often levied on energy products and vehicles rather than on CO <sub>2</sub> emissions directly.  Needs care to ensure that it is not regressive.	Local transport (with worst emissions)  Fossil fuel power stations  Major industries producing climate change gases.	London congestion charging scheme
	<b>Direct funding</b>	Grant aid to specific bodies to produce specified environmental benefits.  Council expenditure on environmental management  Using retained business rates to support key environmental projects  Potential to use loan rather than grant mechanisms - a revolving 'green' infrastructure fund	JC WHS AONB	
	<b>Agri-environment schemes</b>	Payments provided by central government or the EU to encourage farming to benefit the environment.  Subsidies could be redirected to improve carbon emissions, recreation, habitats and diversity	Environmentally sensitive areas  Uplands	
<b>Public support</b>	<b>Membership schemes</b>	A way for visitors and locals to pay an annual 'fee' for multiple access to a particular place(s).  Can apply to businesses as well as individuals	Many already operating in Dorset. If new ones to be established, what would be on offer? How to bundle locations together to make a valuable whole? Has the advantage of being able to contact the members for other reasons.	National Trust Wildlife Trusts RSPB Jurassic Coast Business Partner scheme

Type	Examples	Description	Location applicable	Good practice
	<b>Social Impact bonds</b>	Social impact bonds (SIBs) are designed to help reform public service delivery. SIBs improve the social outcomes of publicly funded services by making funding conditional on achieving results. Investors pay for the project at the start, and then receive payments based on the results achieved by the project.	Could be used for river catchment work	
	<b>Community ownership (shares)</b>	Community Shares refers to the sale of shares in enterprises serving a community purpose. This type of investment has been used to finance shops, pubs, community buildings, renewable energy initiatives, local food schemes, along with a host of other community based ventures		Wessex Community Assets Cultybraggan, Comrie, Perthshire
<b>Creating markets for green goods and services</b>	<b>Wood</b>	Improved management; increase variety of wood products; incentivise new uses (wood-chip boilers); collaborate to produce economies of scale.	Woodland, hedgerows, new woods	Ward Forester Initiative Cordiale Hedgerow project Unlocking Woodland Potential, Exmoor
	<b>Energy</b>	Explore all forms of renewables, subject to sensitive landscapes and local scale. Rooftop solar; bio-energy; bio-fuel, ground source heat.	Close to existing settlements Community owned schemes	
	<b>Nature tourism</b>	Increased enterprise potential for managed wildlife exploration, building on Dorset's particular habitats, heritage and wildlife. Also for guided walks, cycle trails etc	Rivers, chalk downland, Southern Ridgeway	The Crane Trust, Somerset Levels Exclusively Dartmoor Vale Trails and Iolo Morgannwg Trail, Vale of Glamorgan
	<b>Activities</b>	Range of art, craft and play activities to attract and then provide interest for visitors. Photography, stained glass workshops, willow weaving, wild food foraging	Beaches, coast, heritage and woodland sites.	Glamorgan Heritage Coast - Coastal Activities pilot
	<b>Food</b>	Support for food production that maximises environmental benefits Invest more in marketing Dorset food brand further afield Local food growing schemes	Local communities, allotments, urban food growing	Local Food Links, Bridport Incredible Edible Todmorden Deliciously Yorkshire
	<b>Ecological enterprise zones</b>	Policy of deploying fiscal and deregulatory incentives in a defined area, such as tax relief, or planning simplification - for the benefit of supporting green enterprise and wider environmental benefits.	West Dorset	Solar Empowerment Zone, New York
	<b>Brand value</b>	Although this goes on to a limited extent, there may be opportunities to licence the two 'brands' more extensively. Also opportunities to sell more branded goods directly. Need caution about types of business allowed to use the brands.	Dorset AONB Jurassic Coast WHS	US National Parks Foundation WWF Partnership



As part of our Stakeholder Workshop, we asked participants to identify possible mechanisms to capture the value of environmental assets and then to assess how valuable they might be, and how easy or hard to implement. Those ideas are shown here.



## Issues

There are challenges inherent in many of these ideas.

### *Paying for 'free' goods and services*

Until the perception of the value of the environment is changed, there may be a reluctance to pay more for what is currently perceived to be 'free'. There would need to be transparent mechanisms to demonstrate that additional payments were being used for investment in the resilience of the assets and not being used as substitution for other costs.

### *Branding and marketing*

It is likely that social campaigns would have to be launched to explain the real value of the environment and the costs of maintaining it as an asset. Once the public (both Dorset residents and visitors) have a deeper understanding of why the environment is so important and how much it costs to maintain, they are more likely to support additional funding - either directly or through taxation.

### *Ownership*

There are difficult issues concerning the ownership of the some types of environmental assets and how that ownership is vested. Should the environmental assets be claimed by the owners of the land; are they owned by the local communities; are they owned by the local authorities; are they owned by the government, on behalf of the whole population? If new markets are created to capture a financial value, say of sequestered carbon or flood protection, what safeguards would there be against asset-stripping?

### *Iterative Pricing Mechanisms*

In circumstances where normal market pricing does not exist and suitable market proxies are hard to find, iterative processes for setting prices sometimes can be used. Environmental assets and/or service flows, especially natural ones, are often non-priced. In order to improve conservation, renewability and use efficiencies, and to reflect amenity value, it can be useful to define environmental assets and flows tightly, then to identify desired outcomes and targets for monetising value, and then set an objective but non-market determined price. Through careful monitoring of outcomes against target, a robust assessment of the set prices can be undertaken and those prices can be altered iteratively until the desired outcomes are approached.

In practice, iterative pricing mechanisms are difficult to achieve because they require a high degree of official commitment and consumer understanding. Also, because regulators are more used to using fees, subsidies or taxes than prices, the approach tends to be indirect, which can make suppliers and buyers resistant to evolution of value. Nevertheless, if a clear process can be set out at the start, there may be circumstances where local iterative pricing can be used to price access, use and other aspects of environmental economic value.

# ACKNOWLEDGMENTS

In producing this report, we have been grateful for the assistance of a number of people.

We would like to thank the Steering Group who have provided information, contacts and constructive feedback throughout the process: Peter Moore, Dorset County Council; Matthew Piles, Dorset County Council; Sam Rose, Jurassic Coast Team; Tom Munro, Dorset AONB; Anne Gray, Dorset County Council; Dave Walsh, Dorset County Council; Sally King, Jurassic Coast Team.

Members of their teams have also helped out with the surveys, accessing data and identifying contacts. In particular, we would like to thank Stephanie Farr for all her help with the surveys; Matt Dickins from East Devon District Council for facilitating the survey there; and Professor Andrew Newton from Bournemouth University for providing access to key information.

We are grateful for those who attended the stakeholder workshop, in October, in Wareham Town Hall. Their ideas have been invaluable, especially for the last section of our report.

Our thanks to the businesses who responded to our telephone interviews, some of whom have been featured as case studies.

# ANNEX 1: GLOSSARY

AONB	Area of Outstanding Natural Beauty
CAP	Common Agricultural Policy
DEE	Dorset Environmental Economy
DLEP	Dorset Local Enterprise Partnership
DLNP	Dorset Local Nature Partnership
EGSS	Environmental Goods and Services Sector
FTE	Full Time Equivalent (employees)
GVA	Gross Value Added
GDP	Gross Domestic Product
LCEGSS	Low Carbon and Environmental Goods and Services Sector
ONS	Office of National Statistics
PES	Payments for Ecosystem Services
RAMSAR	Wetland sites related to the Convention on Wetlands of International Importance
SIB	Social Impact Bonds
SIC	Standard Industrial Classifications
STEEP	Social, Technological, Economic, Environmental & Political factors
SWOT	Strengths, Weaknesses, Opportunities & Threats
TBID	Tourism Business Improvement Districts
TEEB	The Economics of Ecosystems & Biodiversity
WHS	World Heritage Site
WTP	Willingness To Pay

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# ANNEX 3: DEFINITIONS AND VALUES

## SECTION 1: The Dorset Economy

In this appendix, the main characteristics of the Dorset economy are specified, as traditionally measured, providing context for discussing its environmental aspects.

### Overall Economic Performance

The Dorset economy is strong, reasonably balanced and diverse. It is a relatively prosperous and productive spatial area with virtually full employment and a good spread of entrepreneurial businesses and a mix of industrial sectors. It is notably strong in advanced engineering, financial and business services, creative and digital services, tourism and leisure, and some health and social services and land-based activities.<sup>70</sup>

Dorset has reasonably robust human and physical capital and physical and virtual infrastructure. There are, however, pockets of deprivation and low productivity, issues of skills gaps and retention, and problems of housing affordability and connectivity. Dorset's economy is a fairly normal economy for an area with one major conurbation, lots of other towns and many rural communities. Like many other parts of southern England, it has a mixed (less than optimal) history of innovation and investment, especially in terms of engagement in international trade and other markets.

Economic **growth** is driven by productivity and employment, as affected by technological progress and demographics over time. Historically, Dorset's growth has tended to match the UK average. In real terms, the Office of Budget Responsibility (OBR) determines the UK's underlying growth potential to be about 2.4% per annum in terms of real GDP. It will be difficult for Dorset to outperform this consistently without a radical change in local structures and trends.

For the area covered by the Dorset LEP, **productivity** in terms of GVA per hour compares favourably with its western neighbours but less well compared with its northern and eastern neighbours. In 2013, (the latest data available), Dorset's GVA per hour was 8.9% higher than that in the Heart of the South West LEP area (Devon and Somerset). Compared with the Solent LEP (Hampshire) and the Swindon and Wiltshire LEP areas, however, Dorset was 10.3% and 12.3% lower respectively. These differentials reflect sector and occupational structures and market competitiveness, as well as population, connectivity and supply chain characteristics. In relative terms, such differentials are difficult to change over time. The productivity drivers of investment, innovation, skills, entrepreneurship and competitiveness tend to shift slowly between regions, especially in relative terms: nowhere is standing still and rapid dissemination tends to spread new processes and attributes quickly.

In terms of **output**, Dorset's gross value added (GVA, 2013) amounts to £15.4bn per annum, split roughly equally between the main conurbation (Bournemouth and Poole) and the rest of the county (see table below). There is an urban/rural divergence in per capita terms, reflecting differences in workforce/resident patterns and commuting. On average, there is always more high value activity in larger towns. In comparison with the national averages, Bournemouth and Poole are close to that average (-1.8%) whereas Dorset County is more distant (-21.8%). These relativities are fairly 'normal' – indeed, actually quite strong for such typical areas across the country.

### Productivity (GVA) & Prosperity (GHDl) 2013

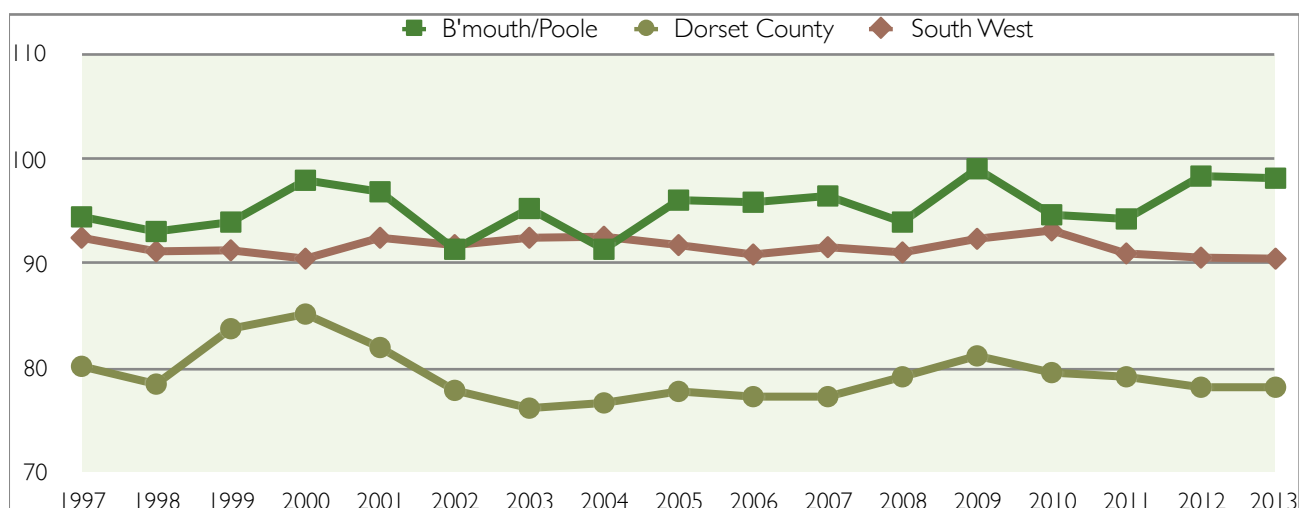
	GVA (£mn)	GVA per head (£)	GVA per head (UK = 100)
Bournemouth & Poole	7762	22981	98.2
Dorset County	7623	18293	78.2
	GHDl (£mn)	GHDl per head (£)	GHDl per head (UK = 100)
Bournemouth & Poole	5932	17563	100.0
Dorset County	7896	18949	107.9

<sup>70</sup> As identified/specified in Dorset LEP's current strategy: *Transforming Dorset – Strategic Economic Plan*.



In terms of **incomes**, Dorset's gross disposable household incomes (GDHI - i.e. post-tax) amount to £13.8bn (see table above), split 43% to the conurbation and 57% to the County area. Again, this reflects workplace/residence and commuting differences. There is an important relative contrast, with County incomes per head 7.9% above and Conurbation incomes equal to the UK average. There are wide differences within Dorset (e.g. a contrast between Weymouth and Portland and East Dorset) but, generally, it is a prosperous area with reasonable productivity.

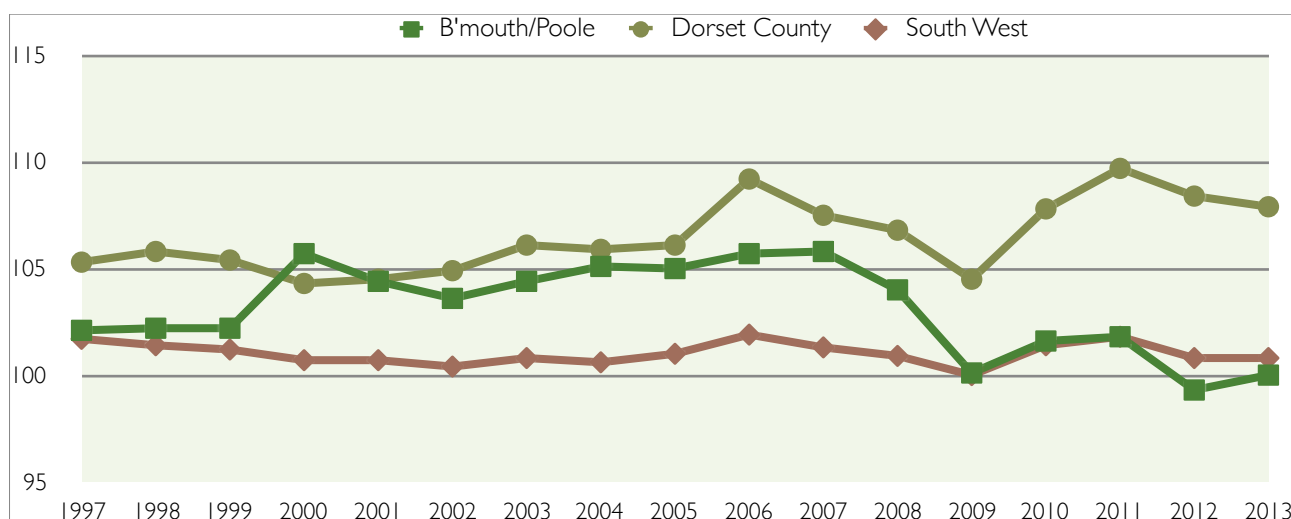
#### GVA per head indices 1997-2013, UK = 100



Source: ONS

These key indices can be volatile year-to-year but, within the context of the UK economy, tend to move in narrow ranges. The two charts show the patterns from 1997-2013 comparing the two main Dorset areas with the rest of SW England. They emphasise the findings outlined above, with the mainly urban area more productive and the more rural areas more prosperous, reflecting established commuting and work/life patterns.

#### GDHI per head indices, 1997-2013, UK = 100



Source: ONS

Local differences are also apparent in the **labour market**, reflecting population characteristics, participation rates and hours worked. Like most of SW England, Dorset tends to have high employment and low unemployment rates. As the table below indicates, however, there is a divergence from this pattern in Bournemouth where a relatively high inactive population, (as officially defined to include students and the early retired), is more of a factor.

### Local Labour Markets (Average % 2014)

	Employment rate	Unemployment rate
England	72.5	6.2
South West	76.0	5.0
Bournemouth	69.7	6.3
Poole	76.5	4.6
Dorset County	79.5	3.7

Source: ONS

Productivity growth is the only sustainable means of raising **living standards** over time. Economic development is about improving productive value through selective sector and market support for investment and export-led growth, leading to high value jobs. The issue for this report is how the environment relates to these conclusions: better awareness of environmental value and use efficiency is an important part of the value chain.

First, the environment contributes to prosperity in the many ways – as an asset, a flow of services and a source of human pleasure. Indeed, official ONS measures of regional wealth and well-being that include environmental factors show that SW England is among the most ‘prosperous’ in the country. In many respects, this reflects the impact of environmental factors that are not traditionally measured in the statistics of GDP/GVA or GDHI. In this sense, the usual economic benchmarks are insufficient to reflect total living standards when environmental factors are not included.

Second, increasing productivity, if measured in traditional terms, can be at the **detriment of the environment**. Raising Dorset’s narrow economic performance to levels comparable with the ‘best’ would probably involve a loss of important parts of Dorset’s natural environment – often one of the reasons why people and businesses are here. Turning Dorset into Middlesex to achieve higher GVA and GDHI per head might not be a choice that many/most Dorset residents would be willing to accept.

It is important, then, for those interested or engaged in Dorset’s economic development to have realistic expectations and aspirations about growth potential and development. Focusing on **Dorset’s Environmental Economy** in the round allows us to more correctly balance the whole gamut of economic performance, characteristics and trends.

### Economic Structure

In mid-2013, there were 754,460 people resident in Dorset of which 60% were aged 16-64, 80% were economically active and 45% were resident in Bournemouth and Poole. The total population is expected to rise by over 100,000 in the next twenty years, putting more pressure on the environment.

### Dorset’s Occupational Structure (%)

Management & senior	11	Leisure & care services	10
Professional & technical	34	Sales & customer services	8
Administration	10	Elementary	5
Skilled trades	13	Process, plant & machinery	10

Source: dorsetforyou from ONS & other government statistics

### Dorset's Employee Structure (%)

	Bournemouth	Dorset	Poole	GB
High skills	39.9	46.8	45.9	44.3
Knowledge driven	57.1	48.8	53.7	52.9
Advanced manufacturing	1.3	4.7	5.7	2.6
Creative Industries	3.1	2.4	3.4	4.1
Social care	3.4	4.0	3.2	2.7

Source: dorsetforyou from ONS & other government statistics

The first table above shows the occupational structure in Dorset. These ratios are not markedly different from SW and GB averages. In terms of employees in employment, 10% are in manufacturing and 83% in services: the residual being land-based sectors, construction and utilities. In 2014, full-time average earnings of residents were £510 per week (98% of GB average) in Bournemouth, £498 per week (96%) in Dorset County, and £519 per week (100%) in Poole.

The private sector accounts for 80.2% of Dorset's employees (83.3% Bournemouth, 78.9% Poole, and 79.4% Dorset County). This compares with 77.4% for the GB average. The previous table summarises the structure in certain key "growth driving" activities, showing a favourable distribution compared with the GB average for many elements.

Business demographics for 2013 identify 30,725 enterprises in Dorset, with 6,620 in Bournemouth, 6,235 in Poole and 17,870 in Dorset County. Dorset has about 34,600 local units (VAT or PAYE registered). The next table shows how these are distributed by major output sector. Unsurprisingly, the land-based entities are largely outside the conurbation whereas distribution (wholesale and retail) is more important in the conurbation. Other differentials of note are the low relative production ratio in Bournemouth and the countervailing higher education and health ratio.

### Dorset Business Units 2014 (No. & %)

	Agric, Fo, Fi	Production	Construction	Distribution
Dorset LEP	6	7	12	18
Bournemouth	0	4	12	21
Dorset County	10	7	12	17
Poole	0	8	14	20
	Trsp & comms	Accom & Fds	Finan & Prop	Prof, Sci & Tech
Dorset LEP	8	7	6	13
Bournemouth	10	8	8	13
Dorset County	7	7	5	12
Poole	11	6	7	13
	Business servs	Public Admin	Educ & Hlth	Leisure & other
Dorset LEP	6	1	8	7
Bournemouth	7	0	11	7
Dorset County	6	1	7	7
Poole	7	1	8	6

Total Units: Dorset LEP 34,600, Bournemouth 7,125, Dorset 20,825, Poole 6,655

Source: dorsetforyou from ONS & other government statistics

In size terms, Dorset has 68% of units with under five employees, exactly the same as the GB average: 28% are between 5 and 50 employees and only 3% above 50. There are only minor differences between the conurbation and county areas. There are only 30 firms in Dorset employing more than 250 employees.

This summary of the Dorset economy, as traditionally measured, provides an important foundation for understanding the environmental aspects of that economy.

## Section 2: The Environment and the Economy

In this appendix, the theoretical and applied relationship between the environment and the economy is discussed.

### Theoretical Context

Dorset's environment and its economy are intrinsically and intimately linked. Defining human economic resources – intellectual and physical skills and strengths – as ultimately a product of the Earth's natural processes, it is a tautology to say that the economy is the environment and the environment is the economy. For the most part, however, when discussing the environment in this report, the non-human elements of the environment are paramount: those aspects of “nature” that people exploit, change and disseminate to add economic value – the materials, fuels and inherent environmental attributes that people extract, use, enjoy, consume and dispose of through the market economy.

Economics is the study of how human beings allocate scarce resources in order to express choice. Ultimately, all resources are natural – deriving from, being consumed in and returning to the environment. Choice is necessary because access to resources of matter, energy, space or time is not unlimited. Accordingly, the economic aspects of human development reflect the choices made and the systems created to define preferences and priorities and to assess value.

The history of economic development is about efforts to improve the efficiency and efficacy of the invented mechanisms of choice – along the spectrum from centrally planned through regulated mixed market to pure market allocation mechanisms. For much of that history, the natural environment has been treated as an inexhaustible, valueless resource. Accordingly, it has tended not to be measured in comprehensive, verifiable, systematic and standardised forms. Even today, an agreed statistical framework to analyse the true relationship of value between the economy and the environment is lacking, especially at a local or sub-national level. Our political, socio-economic systems have and remain focused primarily on the labour and technological aspects of choice and its drivers of wellbeing and not on natural resource use and preservation.

In the twenty first century, the limits to environmental renewability and the costs of environmental degradation, in terms of nature's diminished ability to provide goods and services to the economy, are more evident. The economic value of sustainable development is increasingly, though arguably still inadequately, recognised. It is more obvious that, if the human population continues to grow, we will need to sustain and enhance the environment in order to achieve sustainable economic growth. Over time, society changes what is ‘valued’. Increased scarcity increases value. A race is on to recognise environmental value in the economy. The irony would be if the contribution and value of the environment to economic development were only full recognised at the point where aspects of it are no longer viable or available to the value chain in a sustainable form.

Economic choice can be transformed by human invention and innovation (processes of technological and intellectual change). In the end, however, reflecting the laws of physics, we are talking about the choice of what we take, use and put back into the environment. The environment is an input (a factor of production) and an output (source of income and benefit) in the economic system of decision-making about resource allocation. This integral, complex and multi-faceted aspect of the relationship between environment and economy is what makes it difficult to analyse, assess and measure in the traditional terms of economic development.

The process of economic growth and distribution involves the capture of natural resources (environmental assets, goods and services), using and transforming those resources in ways that add economic value (and build wider wellbeing), before recycling or returning the spent or waste products back to the natural environment. The process of economic development changes the environment but also creates the wealth and aspiration to further environmental conservation and enhancement.

At an applied level, Dorset is “selling” its environment as part of its economic “offer” or “brand”. It does this through the exploitation of natural materials and fuels (e.g. Wytch Farm oil and Purbeck minerals) to supply economic value (dairy and arable agriculture and processed goods and catering and accommodation services) and to increase enjoyment of environmental amenity to satisfy the final demands of businesses, residents and visitors.

Dorset’s environmental assets and attractions are among its most inherently valuable assets. The local environment contains and contributes attributes that add economic value and influence the form and process of growth through productivity and employment; and it builds wellbeing. Dorset’s environment influences markets in a range of direct, indirect and subtle ways, dictating supply chains and vectors of demand and influencing market prices for a range of property, other assets and amenities. This report is about trying to define these assets and flows in a local context.

## Applied Context

The modern market economy approaches the issue of resource allocation through the price mechanism. Through Adam Smith’s famous “invisible hand”, prices are supposed to incorporate all aspects of the costs and benefits of production. Then, markets that clear optimally are efficient and effective and yield ‘best’ value to the economy as a whole, maximising individual and aggregate utility.

In utilising the environment as factor of production and as a source of value, the market system should account for the costs and benefits of the whole process from extraction and use to waste. The value of the goods and services produced (output) and the jobs and incomes generated (employment) should reflect relative productivity (driven by investment, innovation and skills, entrepreneurship and competitiveness) and be represented through relative prices in the market place and in living standards (incomes).

In the real world, the problem for the environment and the economy is that the relevant price signals can be confused, wrong or absent. Market and government ‘failures’ exist that can distort environmental choice, abuse environmental sustainability and undervalue the environment’s contribution to development. These failures can be summarised as:

- **Externalities** – benefits or costs that are unaccounted for by market prices and behaviours, often reflecting weak or absent property rights
- **Public goods** – costs and benefits that are open or imposed on all affected by an activity because of ‘non-rivalry’ and ‘free rider’ issues – the inability to isolate impact to those directly involved in market transactions.
- **Market power** – resource distortions caused because some market actors have more power or influence over pricing or other market factors than others in a way that is bad for market efficiency or efficacy
- **Imperfect information** – costs and benefits imposed because economic actors are unable to gain, process and act on all relevant information, resulting in demand and supply mismatches that produce sub-optimal resource allocation
- **Timing and Policy** – government failures resulting from sub-optimal timing issues about the dissemination of productivity driving investment, innovation and skills and the unintended consequences of fiscal, regulatory, direct provision and other state measures that distort decision making and market outcomes.

When approaching these ‘failures’ in relation to **Dorset’s Environmental Economy**, we have to consider locational factors related to urban/rural and agglomeration effects and reflect on market and wealth imbalances and the process of growth through dynamic change. The environment is both an investment and a consumption contributor to growth. Eliminating or minimising failures’ can capture real efficiencies that would not otherwise be attained. Moreover, such interventions should build the potential for sustainable growth in the future.

This can happen in a myriad of ways. In this context, the **Dorset Environmental Economy** offers a stream of net returns to underlying growth potential over time. In particular, this report addresses how such contributions in terms of the potential for net additional impact on output and jobs and, thereby, the productivity and employment drivers of growth might be analysed.

The impact of the **Dorset Environmental Economy** is considered primarily in relation to its output (usually measured locally as gross value added – GVA) and employment (usually measured as full time equivalents – FTEs) ‘multiplied’ effects on development through three main aspects.

- The **direct effect** of a particular environmental asset or flow on output and employment in a relevant business, sector or spatial area
- The **indirect effect** on suppliers in the local, sector supply chain because of purchases made in relation to the environmental economy
- The **induced effect** of the incomes generated by the direct jobs created by the environmental economy on the wider economy

As well as output and jobs, these impacts reflect place and their branding through demand and supply. In this respect, the Dorset Area of Outstanding Natural Beauty (AONB) and World Heritage Site (WHS – Jurassic Coast) designations are significant. Conservation and development are linked to economic growth through the value attributed to environmental assets and flows and the way they affect the productivity drivers and the population’s participation. More broadly, this framework needs to incorporate other benefits to wider wellbeing across the generations: both the use and non-use values of the environment (“total economic framework”) to an underlying sense of value beyond the boundaries of monetary assessment.

Finally, however, this commission is not able to undertake primary analysis in order to achieve a detailed economic valuation of nature. To calculate useful values in terms of the use, non-use and option of extrinsic environmental characteristics, for example, it would be necessary to undertake:

- a) Extensive expenditure on surveys to establish market prices and to calculate ‘willingness to pay’ and ‘stated’ or ‘revealed preference’ in order to have robust proxy prices for environmental assets and flows; and
- b) Detailed technical interrogation of putative or real damage costs and production functions.

Limited surveys have been undertaken and are explained and analysed elsewhere in this commission. In broad terms, they prove to be consistent and compatible with the analysis in this part of the report based on secondary approximation.



## Section 3: Accounting for the Environmental Economy

There are two main aspects of accounting for the environment in the economy: the environment as a provider of capital assets and as a source of current flows to the growth 'chain'. Accordingly, ecologists, economists and statisticians often account for the environment in the economy by reference to a materials and fuels balance over time. The ONS' UK Environmental Accounts reflect on this each year by looking at a range of environmental contributions to the economy. These form a basis for defining **Dorset's Environmental Economy** as a subset of the national figures.

### UK Environmental Accounts

The latest UK environmental accounts, released in mid-2015, "show how the environment contributes to the economy, ... the impact the economy has on the environment ... and how society responds to environmental issues". As satellite accounts to the main national accounts, they are estimated to be comparable statistics to other economic indicators.

The UK accounts divide environmental matters into a number of categories. First, we consider the financial, material and energy flows.

#### Fuel Use

Fuel is a material that stores and releases energy. Fuel use is different from energy consumption – the former is largely fossil combustion to provide heat whereas the latter includes energy used for other purposes, such as manufacturing. UK fuel use was 190.3 million tonnes of oil equivalent (Mtoe) in 2013. It was 10.9% lower in 2013 than in 1990 and 17.5% below the 2005 peak, with trends towards gas (38% of use) and diesel (13%) and away from coal and petrol, reflecting shifts in electricity generation and transport use.

#### Energy Consumption

Energy consumption is the use of energy for power generation, heating and transport as an input to production and consumption more generally. In 2013, total UK energy consumption was 213.4 Mtoe, 14% below the 2005 peak. Fossil fuels contributed 86.6% to energy consumption, down from a peak of 91.7% in 2008. Nuclear provided 7.2% and renewables 5.6%: the latter still small but 8.2 times more than it was in 1990. Households consumed 79.8 Mtoe, (37.4% of the total), manufacturing 44.8 Mtoe (21%) and transport and communication services 31.5Mtoe (14.8%). Within renewable energy consumption, 31.8% were from waste, 33.1% from solid biomass, 25.4% from primary renewable generation and 9.7% from liquid biofuels.

#### Energy Intensity

Energy intensity is a measure of energy efficiency. Reflecting changing economic structures, production processes and technologies, and temperature variation, it has followed a general downward trend over time. It reached 3.8 terajoules per million pounds (TJ/£m) in 2013, falling by a third since 1997. Although it varies year-to-year, reflecting the overall pace of economic growth and other trends, all sectors are seeing declines in energy intensity over time.

#### Atmospheric Emissions

UK residents (in all their economic activities) emitted 643.1 million tonnes of carbon dioxide equivalent (Mt Co2e) greenhouse gases in 2013. This was 23.6% less than in 1990, although the series is volatile year-to-year. Carbon dioxide represented 84.4% of total emissions. Other emissions include methane, nitrous oxide and fluorinated gases. The energy and waste sectors contributed 29.5% and this, with manufacturing (-36.2% 1990-2013), account for the biggest reductions in emissions over the years.

Consumer expenditure is the second largest emitter, after energy and ahead of manufacturing. Transport and communications and land-based sectors (agriculture, forestry and fisheries) are other major emitters. Greenhouse emissions intensity has fallen on average by about 3.6% per annum since 1997 (44% overall). The largest declines have been in the land based and energy sectors.

Other emissions, such as acid rain and heavy metals, have also tended to decline over time. Road vehicle emissions have fallen since 2007, but this reflects the effects of the “Great Recession” on overall economic activity rather than an underlying trend. Actual road emissions remain close to 1990 levels at about 110 MT CO<sub>2</sub>e per annum.

### **Material Flows**

In 2013, 9.2 tonnes of material resources were consumed per capita. Domestic extraction is falling whereas imports are rising. The physical trade deficit continues to increase and is now close to 150 million metric tonnes (MMT). This massive deficit must be considered carefully when interpreting materials flow balances.

Overall, resource productivity – output per natural input – increased 50% between 2000 and 2013. Direct material input (DMI) and domestic material consumption (DMC) have both fallen, especially since the economic downturn began in 2008. There appears to be some decoupling between resource use and growth, reflecting the changing pattern of final consumption (more virtual and less material goods and services). The ratio of GDP to DMC increased 55.3% from 2000 to 2013.

### **Environmental Goods and Services (EGSS)**

In 2013, EGSS contributed £26.3 billion (bn) (1.6% of GDP) to the economy’s value added, £55.4bn to total output and 357,200 full-time equivalent (FTE) jobs. EGSS estimates are experimental and still under development but provide an important theoretical and real element of measuring economic contribution from the environment.

### **Waste**

Household waste amounted to 26.5 million tonnes in 2012, with a recycling rate of 43.9% (compared with an EU target for the UK of 50% by 2020). Collecting, processing, reusing and disposing of waste is an important economic activity. It is debated whether this adds to economic performance (as most GDP definitions would suggest) or whether it should be considered as a negative from overall wealth creation.

### **Water Use**

In 2011, England and Wales abstracted 10.46bn cubic meters of water, 58% from the public supply and 42% directly by private sectors of the economy. Households used 47.4% of the public supply, services 9.8% and manufacturing 4.3%. Leakage was 18.8% and other use 19.8%. For direct abstraction, the equivalent ratios are 57.9% for households, 20.1% for land-based sectors (agriculture, forestry and fishing), 11% for manufacturing and 8.4% for sewerage and waste.

### **Environmental Taxes**

Environmental taxes raised £44.6bn in 2014, contributing 7.5% of all state taxes and contributions and about 2.5% as a percentage of GDP. This latter ratio has remained fairly stable over time, although the yield has risen in current price terms (about 5% per annum). The former ratio has been more volatile in line with fluctuations in other economic circumstances and, hence, relative tax returns. So-called environmental taxes contribute significantly to the general exchequer.

In 2013, hydrocarbon oil duties accounted for 60.8% of environmental taxes. Energy production provided 72.9%, transport 23.7% (largely ownership and use of vehicles) and pollution 3.4% (waste/resources extraction – largely landfill taxes).

### **Environmental Protection Expenditure (EPE)**

In 2013, the UK government spent £14.4bn on environmental protection – activities aimed at reducing pollution and environmental degradation, 80.3% related to waste management and the rest largely on protecting bio-diversity, then R&D and pollution abatement. The total amounted to 0.8% of GDP. Government EPE climbed steadily from 1997 to 2009 but has stalled thereafter.

Industry EPE was £3.5bn in 2013. The utilities (electricity, gas and water) contributed £824.1mn (23.6%). Food, drink and tobacco added £447.6bn (12.8%). Again, most is waste management (water and other at 59.2%). Also, most is operating expenditure (43%-79% depending on sector), followed by capital expenditure and then R&D.

Next, we consider the stock of natural capital and changes in that stock.

## Natural Capital

Natural capital is the stock of physical natural resources and the eco-services they provide. This includes resource materials, ecosystems, and landscapes that provide economic benefits. Changes in these stocks were unrecorded historically and the statistics remain experimental. Increasingly, however, they are seen as a vital ingredient of economic and overall wellbeing.

### Oil and Gas

The expected quantum (proven and probable, but not possible) of UK oil and gas reserves was 746mn tonnes and 452bn cubic meters respectively in 2013. In value terms, this amounted to £63.2bn at the time. Although global oil prices are falling this year, this measure tends to rise with the economy and scarcity over time whereas the volumes tend to deplete, unless significant new discoveries are made. Monetary valuations tend to be versed in terms of moving averages, reflecting final market prices and the expected movement of commodity prices and financial yields over time.

### Land Cover

Pastures and semi-natural grasslands represent 39% of the UK land area. Cultivated and urban areas account for 17.7% and 11.6% respectively. Woodland (broadleaved and coniferous) amounts to 11.8%, shrub and heath land 5.4% and open wetlands 11.5%. The national accounts do not openly value these land types. Nevertheless, they all offer differing degrees of direct output, amenity and other service values to the economy.

### Freshwater Systems

The asset value of UK freshwaters (mostly open waters but also wetlands) was set at £39.5bn in 2012. Its services are mainly about freshwater extraction but also about recreational use.

### Timber Assets

The 2014 stock of standing timber was 604.7mn cubic metres "overbark" (57.7% coniferous and 42.3% broadleaved). In 2013, natural growth (20.4mn cubic metres) exceeded removals and other losses (14.7mn). Removals amounted to 2.2% of the stock (largely coniferous). Experimental valuation suggests timber stocks to be worth £7.5bn, growing over time (+3.3% in 2013).

### Woodland

The woodland area was growing but has levelled out at over 3.1mn hectares since 2010. Of this area, 27.6% is publicly owned. Woodland provides various services, including material value, environmental regulation and condition, and culture/leisure. In 2013, 14mn cubic meters of wood and 16.9mn tonnes of CO<sub>2</sub>e were removed, whilst an estimated 570mn visits were made. Combined, these three elements were valued at £3.2bn, with £79mn of wood, £995mn of carbon sequestration and £2bn of recreation. So, the visitor economy dominates the value of woodland use to the economy. In net present value terms, over a 50-year period, woodland ecosystems are said to be worth £92bn.

It is not straightforward to convert these national environmental accounts into equivalent figures for Dorset. But, it is possible to make some qualitative comments and assumptions in order to support definitions and descriptions. For example, Dorset's proportions by population, area, sector, land type et al could be used to estimate relevant factors. Since Dorset's population (c 754,460 in 2013) is about 1.2% of the UK total, Dorset's area (2,653 square kilometres) is 1.1% of the UK total and Dorset's economy (c£15.4bn GVA 2013) is 1% of UK total GVA, the table below factors national figures for environmental assets and flows by these ratios.

## Dorset Environmental Flows and Assets if a simple proportion of UK totals

Flows		Assets	
Fuel Use	2.3 mtoe	Oil and gas	£0.7bn
Energy Consumption	2.6 mtoe	Freshwater systems	£0.4bn
Energy Intensity	0.05TJ/£m	Timber	6.7cum ob
Atmospheric Emissions	7.7mtCO <sub>2</sub> e	Woodland	0.03mh
Material Flows	0.1tpc		
EGSS – value added	£0.3bn	EGSS - FTEs	3,572
Waste	0.3mt	Environmental taxes	£0.4bn
Water Use	0.125 cu.m	Environmental expenditure	£0.14bn

Source: Strategic Economics

These estimates are a rough benchmark for discussion, modification and further research. In many cases, the flow estimates based on population shares is probably not a bad assumption, given the uniformity of living and consumption patterns across the United Kingdom and beyond.

## “Green” Employment

An alternative way to approach the definition and description of the environmental economy is to consider employment in activities with environmental content.

A recent study explored the range of approaches to jobs in the environmental economy<sup>71</sup>. These different approaches include:

- All jobs are environmental because they are ultimately dependent on the use and change of natural, environmental resources;
- Environmental jobs (EJs) are those that directly deal with natural resource assets or flows;
- EJs are those directly associated with bio-geo sustainability;
- EJs are all those in environmental technology sectors, including relevant manufacturing, utilities, land based and services; and
- EJs are any jobs, in any sector, that are geared to maximising economic value whilst minimising environmental cost – any job that ‘improves’ environmental use.

This broad range of definitions implies some very different scales of measurement as well as meta-definitions.

- The US Bureau of Labour Statistics defines green jobs as “Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources; or jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.” The first element of this definition implies a traditional sector approach to economic measurement whereas the second reflects occupational structures.
- The UN Environmental Programme defines green jobs as “Agricultural, manufacturing, R&D, administrative and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials and water consumption through high-efficiency strategies; de-carbonise the economy; and minimise or altogether avoid generation of all forms of waste and pollution.” This approach focuses more on the environmental impact of economic jobs.

<sup>71</sup> *Green Jobs – What are they, where are they and how can they be measured? : Andrew Mearman, Anthony Plumridge & Gail Webber – paper to SW Regional Studies Association, UWE 2015*

- Several commentators refer to “green” jobs as those that are “relatively green” compared with what has been done before – e.g. reducing the energy consumption or waste emissions of production and consumption. In this view, almost any job can be classified as environmental. It is a matter of practical observation.

It is important to recognise that, under any definition, jobs are dynamic and may be more or less “green” at different times and that there is a qualitative element as well as a quantitative one. But, essentially, “green” jobs recognise the value of nature and promote environmentally based wellbeing.

Environmental jobs can be found in environmental goods and services sectors (EGSS), in the low carbon economy, in goods and services that reduce negative environmental impacts or add to preservation of natural capital, and in roles specifically created to enhance environmental sustainability (in existing operations).

According to Eurostat, EGSS consists of a heterogeneous set of producers of technologies, goods and services that:

- *“measure, control, restore, prevent, treat, minimise, research and sensitise environmental damages to air, water and soil as well as problems related to waste, noise, biodiversity and landscapes. This includes ‘cleaner’ technologies, goods and services that prevent or minimise pollution”.* This definition sets environmental jobs as those engaged in Environmental Protection.
- *“measure, control, restore, prevent, minimise, research and sensitise resource depletion. This results mainly in resource-efficient technologies, goods and services that minimise the use of natural resources”.* This definition specifies environmental jobs as those involved in Resource Management.

According to the definition of the Department of Business, Innovation and Skills (BIS), EGSS includes employment where at least 20% of business and other turnover falls within environmental (largely pollution and waste), renewable energy (biomass, geothermal, hydro, solar, wave, tide and wind) and low carbon activities (alternative/additional energies and fuels; finance, management and technologies; and carbon capture and storage). Based on this, the ONS has plans to release a Low Carbon and Renewable Energy Economy Survey shortly (perhaps, November 2015).

Given all these definitions and processes, it is not surprising that there is no accepted standard of “green” jobs measurement. Broad estimates range from 3-9mn for the United States, around 4mn for the European Union and just under 1mn in the United Kingdom. As in the section on the UK environmental accounts (above), current ONS results suggest the narrower EGSS definition contributes £55bn of output, £26bn of value added and 357,000 FTEs (2012).

In conclusion, “green” jobs are dispersed throughout the economy and a “green” sector base approach may not capture the full extent of the contribution. “Green” content in jobs is often only part, and an unspecified part, of any job description. Moreover, “green” content varies within jobs and organisations over time. Environmental job allocations are always, to an extent, arbitrary and current statistics are unsatisfactory. Generating objective measures, especially at a regional or local level are, at best, “challenging”.

## Comparative Studies of Value

A number of studies have attempted to value the contribution of the environment to the economy.

The Environmental Economy has a wealth of assets and flows. Many are vital to economic and wider life and wellbeing<sup>72</sup>. These include economic, social and cultural factors of bio and geo diversity that bolster resilience and insure against future vulnerability. The environmental economy is said to provide three main contributions of value to human wellbeing.

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<sup>72</sup> *Revealing the Value of Nature – English Nature (2002)*

- Nature for current an inherent enjoyment, health and medicine, culture, art and history, and for education and learning
- Nature for its products of foods, fuels, and other ingredients such as fertiliser, fodder, cosmetics and pharmaceuticals
- Nature for its services, such as pollution control and flood defence, soil fertility/nutrition, and waste disposal and degradation

**Nature Reserves** and designations contribute to these functions and, more directly, to employment and value locally<sup>73</sup>. The total visitor economy, for example, has been estimated at over 8% of GDP and “the environment” is a key driver of that demand. For example, the RSPB estimates that its reserves add 1,872 jobs and £66mn of expenditure to local economies, encouraging start-ups and employment in areas of otherwise limited job and entrepreneurial opportunities. In England, at the end of the last decade after a period of robust growth, the RSPB calculated that 2.8bn visits were made per annum to the natural environment; visitors spending £20.4bn. The 2mn or so visitors to RSPB reserves are estimated to spend £44mn per annum locally.

Assessing multiplier impact through direct employment, volunteer and employee spending, direct expenditure on the reserves, spending locally outside the reserve, and local farming contributions, the RSPB calculates the economic value of its Arne Reserve (in Dorset) in terms of 11.8 direct FTEs worth £1.1mn of annual direct spend adding another 25.5FTEs, (revealing 37.3FTEs in total) and contributing to the wider (£95mn pa) tourism market in Purbeck and Dorset generally.

**Areas of Outstanding Natural Beauty** (AONBs) are said to cost the taxpayer about 60p per person per annum<sup>74</sup>. In total, all the AONBs are estimated to contain 85,500 businesses, generating £20bn of GVA (equivalent to the City of Birmingham), receiving 260mn visitors who spend £6bn, employing volunteers who add £40mn worth of work, and supporting 120,000 jobs. The AONBs are said to create activity through screen and nature tourism, food and drink, green space (landscapes and mindscapes), history and sport.

Other studies focus on the value of **ecosystem services** (ESS)<sup>75</sup>, such as clean water, flood defence, and provision of foods and medicines. These were famously valued globally at US\$33 trillion per annum in the late 1990s (80% more than global GDP as measured at the time)<sup>76</sup>. Such valuation exercises highlight that the environment provides a range of provisioning, regulating, supporting and cultural services for which prices for value and/or costs for degradation can be ascribed either through market innovation and/or direct costing and state intervention. Businesses and communities tend to resist paying for ESS that they believe they have had for “free” before. But, when the positive value of services and the costs of degrading them are established, the business case for accurate pricing becomes clear. Indeed, business mitigation costs reveal that they have not been getting “free” goods and services at all.

At a European level, the Natura 2000 list of 26,000 **environmental sites** was valued in 2011.<sup>77</sup> Aimed at conserving EU biodiversity and the flow of ESS, Natura 2000 recognises the value of ESS use (direct, indirect and option benefits) and non-use (existence, inheritance and altruistic benefits). Looking at site value, it aggregates up local values, finding about €225-315bn of ESS per annum. On a habitat basis, it finds about €190-310bn per annum.

This study also considered costs and benefits from carbon sequestration, natural hazards, water protection, and pollination, revealing significant amounts of potential benefit in productivity terms and cost savings

<sup>73</sup> *RSPB Reserves and Local Economies. RSPB (2011) and RSPB Natural Foundations – Conservation and Local Employment in UK*

<sup>74</sup> *So much more than the View – English AONBs (2015)*

<sup>75</sup> *Valuing Nature – The Economics of Ecosystem Services - J Erikson & T Singer (2010)*

<sup>76</sup> *The value of the worlds’ ecosystem services and natural capital - Costanza et al (1997)*

<sup>77</sup> *Estimating the overall economic value of the benefits provided by the Natura 2000 network – IEP, GHK et al (2011)*



from prevention. The former (productivity) might include flows of foods from agriculture and fisheries whilst the latter (savings) reflect mitigation, restoration and other costs.

Finally, market and non-market benefits from tourism and recreation were generated. The former compiled 1.7bn total visitor days worth €50-85bn per annum (2006 prices) whilst the latter were considered worth €5-9bn per annum. The detailed, disaggregated amounts in this study can be used as a basis to value local services, suitably adjusted to reflect local habitats and current values.

In the UK context, Defra has emphasised the benefit flows and cost savings that can be generated by more accurately **valuing nature**<sup>78</sup>. It suggests that 30% of ESS are in decline and fragmented. It believes that growing the green economy and reconnecting people with nature offers significant economic value and that:

- For business, this must be reflected in the fiscal and planning systems in a way that incentivises the capture and conservation of natural capital and flows.
- For people, drives access to the benefit of health, education and volunteering.

Below the national level, there have been attempts to value the **National Parks** – described as “fundamental to our prosperity and well-being”.<sup>79</sup> At 1.2 million hectares (9.3% of the England land area) and a population of over 320,000, there are said to be 22,500 businesses (1.2%) employing 141,000 jobs (0.6%) and generating GVA of £4.1-6.3bn (0.6%, 2012 prices). In sector terms, they are dominated by farming and forestry and tourism and recreation.

Next, many studies of the English **AONBs** have been undertaken to value ESS and other aspects of **environmental economic value** (EEV). These were summarised and utilised in a recent study of the Cotswold AONB.<sup>80</sup> The Cotswolds is one of the largest and most visited AONBs. It comprises 9,500 businesses with a turnover of about £5.3bn per annum, generating £2bn worth of GVA and about 54,000 employees across all sectors. Farming and tourism, sectors closely linked with EEV, are estimated at about 20% of total employment. Around £1.25mn is spent each year to preserve and enhance the AONB.

The Cotswolds AONB provides business and people benefits in terms of a high quality of environment/life, a strong brand and a good customer base of residents and visitors alike. Accommodation, leisure and countryside/farm businesses benefit most. There are some perceptions of negative aspects for growth for transport, minerals extraction and some industrial activities with respect to costs, logistics and planning. Local surveys suggest many businesses use the Cotswolds brand and most indicate a positive impact on turnover. Conservatively, around £260mn of GVA (13%) and 7,500 jobs (14%) are said to be critically dependent on the high environmental quality. Impact multipliers push these totals to £337mn and 9,720 respectively.

For the **WHS/Jurassic Coast**<sup>81</sup>, the argument is that the local economy has become more dynamic since the official designation in terms of a range of economic factors including investment, infrastructure, business networks, products and start-ups, and employment and social development. However, the main findings are anecdotal about identity and branding, some impact on visitor motivations and proposed public spending on promotional facilities. There are few or no hard numbers about net benefit outcomes as opposed to belief or intention.

Elsewhere, there are many studies of WHS impact and/or valuations around the United Kingdom and the world<sup>82</sup>. Such reports tend to focus on the celebration and heritage aspects of WHS designation rather than the branding or development context that is most relevant here. Moreover, given the highly diverse

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<sup>78</sup> *The Natural Choice: securing the value of nature* – HMG (2011)

<sup>79</sup> *Valuing England's National parks* – Cumulus Consultants Ltd and ICF GHK (2013)

<sup>80</sup> *Assessment of the economic value of the Cotswolds AONB* – Silcock, Rayment et al (2013)

<sup>81</sup> *An Economic, Social and Cultural Impact Study of the Jurassic Coast* – ERA Ltd (2009)

<sup>82</sup> For example, see “World Heritage Status – Is there opportunity for economic gain?” Rebanks consulting & Trends Business Research on behalf of the Lake District World Heritage Project (2009).



nature of WHS sites around the world and the unique nature of the Jurassic Coast, it is difficult to make clear comparison of the limited valuations made. Nevertheless, in the later section of this report, however, where assessment of the Jurassic Coast is undertaken in detail, relevant comparisons are considered.

Other sub-regional studies include one for Devon<sup>83</sup> and one for Somerset<sup>84</sup>.

The **Devon** report defines 'green' activity in terms of businesses in a) primary/land-based industries, b) energy/carbon/technology activities, c) beneficiary sectors –tourism, foods and marine and d) environmental services and social impact. As here, it describes Devon's environmental economy broadly in terms of contribution to output (GVA) and employment (FTEs) and relates these to local strategic priorities and growth potential.

The **Somerset** report considers the local economy as a whole and relates environmental assets and flows to these aggregates for outputs, incomes, employment and other variables. It considers the links between ESS and traditionally measured 'goods'; again, identifying land use, and wider economic and social assets and benefits.

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<sup>83</sup> *Devon's Green Economy: Report on a Scoping and Baseline Study – Transform Research Consultancy for Devon County Council (2012)*

<sup>84</sup> *Making the case for Nature from a Socio-economic Perspective: Evidence for Somerset's State of the Environment Report – Yellow Field Consulting for Somerset Wildlife Trust & Somerset LNP (2012)*

## Section 4: Sector Flows in the Environmental Economy

### Analytical Framework

The **Dorset environmental economy** has been defined in terms of a *flow of value*. Factors such as the production & processing of agricultural products, management of resources and the amenity values attached to Dorset's environment can all be measured by the value that is generated through related business activity: the value that is created as those resources are utilised in a variety of economic ways.

For most resources, assuming conservation efforts are in place (e.g. soil quality or landscape preservation) economic activity depends on the products of renewable flows (e.g. agricultural products that can be grown and consumed year-by-year or amenity values that can be appreciated without deterring others to do the same). There are also non-renewable resources, such as fossil fuel or mineral extraction, for which consumption implies, without new discoveries, a net loss of total potential capacity over time.

One of the difficulties in defining what parts of the economy are largely dependent upon environmental factors is that, as reviewed earlier, there are many different definitions of the 'environmental economy' which each raise their own methodological issues. Views about the appropriate narrowness of definitions vary widely.

Further difficulty is caused by the 'classification' of industries/sectors through traditional means (principally the Standard Industrial Classification (SIC) methodology), which does not neatly capture economic activity that may be closely associated with the environment. In any exercise, an element of agreed expert judgement has to be applied. Given the current resources available, the methodology adopted here is to build on similar exercises undertaken in other spatial areas.

First, we consider work undertaken on behalf of Scottish Natural Heritage<sup>85</sup>. This reviewed all of the sectors across the 2003 Standard Industrial Classification (SIC) system and then made an estimate of the extent to which each sector relies on and/or utilises the natural environment. This process focused on those sectors that need a high quality environment, as well as those that utilise resources within that environment<sup>86</sup>. As a result, 26 industry sectors were classified as having significant links to the environment. (A 'significant link' was defined as 20% or more of a sector's activities being environmentally related). The resulting sectors included food and drink production, water use, timber production and use, and tourism and recreation.

Scottish Natural Heritage - industry sectors with the greatest links to the environment	
Sector description	3-digit SIC code
<b>Activities concerned with the protection, restoration &amp; enhancement</b>	
Sewage and refuse disposal, sanitation and similar activities	900
Activities of membership organisations not elsewhere classified	913
<b>Activities that make sustainable use of one or more elements of the environment</b>	
Collection, purification and distribution of water	410
Fishing and service activities incidental to fishing	050
Agriculture, hunting and related service activities	011
Forestry planting and related service activities	020
Forestry logging and related service activities	020

<sup>85</sup> 'The Economic Impact of Scotland's Natural Environment' – Scottish Natural Environment - 2008

<sup>86</sup> In the Scottish work, these two factors were seen to be mutually reinforcing. For those sectors where they were not (mining and quarrying), where resources could be exploited at a cost to the quality of the environment, then these sectors were not included. However, because these are sectors that are clearly dependent upon environmental resources, such sectors are included in the range of estimates here.

Fish farming and related service activities	050
<b>Activities which are dependent upon the quality of the environment</b>	
Hotels and restaurants	551
Recreational, culture and sporting activities	923-927
Supporting and auxiliary transport activities, activities of travel agencies	633
<b>Activities indirectly dependent on above products/industry groups</b>	
Tanning and leather products	183
Footwear	193
Production of mineral water and soft drinks	159
Beers and ales	159
Grain mill products and starches	156
Agricultural and forestry machinery	293
Spirits and wines	159
Fishing and services activities incidental to fishing	050
Wood and wood products, except furniture	201
Bread, biscuits and pastry goods	158
Other food products	158
Production, processing and preserving of meat and meat products	151
Prepared animal feeds	157
Construction	452

This approach provides a pragmatic and workable solution to the problem of capturing economic activity that is dependent upon both the *quality* of the environment, as well as the *utilisation* of environmental resources. The sectors included in the Scottish Heritage definition are outlined in the table above, alongside their 2003-based SIC codes. (Any clarification needed as to why that sector has been included, is explained in the relevant footnotes.)

It is useful to comment on the definitions in terms of those sectors that have been included and some that have been excluded.

1. The Scottish definition includes the construction industry due to the relatively high use of Scottish timber in local residential and commercial developments. This is far less appropriate for Dorset. First, the timber resource in Dorset is more limited than in Scotland and the 'local resource input' is lower. Second, the link between construction and the environment seems relatively tenuous. Some construction will be indirectly influenced by the quality of the environment (demand for 'green' locations), but much of the materials used will be 'imported' from outside Dorset. Third, because of its size, including the construction sector in any definition will bias significantly the aggregated estimates.
2. The Scottish definition includes the hotels and restaurant sectors, reflecting local tourism's assumed dependency on the quality of the environment. The environmental influence on accommodation is appropriate but some of the demand for restaurants sector reflects local residents' use, (especially in 'affluent' Dorset). Wholly including this sector could overstate the estimates for this sector. On balance, however, recognising the uncertainty surrounding the 'visitor' economy as a whole, inclusion of restaurants seems justifiable.
3. The Scottish work does not include any extraction industries i.e. mining & quarrying, and oil extraction. This reflects the view that those industries do not maintain the quality of the environment due to their extraction of resource (largely non-renewable). However, these activities are highly

dependent on local environmental resources and, after extraction, production sites can be re-modelled for environmental benefit. Acknowledging the difficult methodological issues entailed here, these extraction industries are included in a wider definition but not in the narrower definition of the environmental economy.

4. The Scottish definition does not include any renewable energy industries. The growing significance of this sector means they should be part of the assessment but, given their relatively recent development, the renewable energy sector is still 'poorly' represented in the SIC system. As part of the wider definition, a workaround is deployed on this problem.
5. The Scottish definition does not include any 'marine' element i.e. ship building/repair even though it does include similar land-based activity i.e. agricultural machinery. Here, it is judged that Dorset's marine environment is a driver of its significant marine industry (from luxury boat building to marine tourism). On balance, its inclusion is warranted (which corresponds with other reports e.g. similar work undertaken in Devon – see table below).

Having adjusted the definition provided in the Scottish Natural Heritage report to Dorset's circumstances, some changes narrow the definition whilst others broaden it. In all cases, the ranges produced reflect the uncertainty implicit in what remains a significantly judgemental exercise.

Devon County Council – 'Green Economy' sector definitions	
Sector description	3-digit SIC code
<b>Agriculture, forestry and fishing</b>	
Growing/propagating crops, raising animals, supporting activities	011
Forestry and associated activities	031-032
Fishing and aquaculture	031-032
Mining and quarrying	051-099
<b>Food and drink</b>	
The processing and manufacturing of food etc.	101-109
The processing and manufacturing of drinks etc.	110
Restaurants, cafes, pubs and other catering	561-563
<b>Tourism and Leisure</b>	
Hotels, holiday centres, hostels and other similar accommodation	551-559
Ancillary transport services	522
Museums, historical sites, visitor attractions and zoos	911-914
Sports facilities, amusements parks and recreation activities	931-932
<b>Marine/Maritime</b>	
Mechanical power equipment	291
Shipbuilding	301
Repair and maintenance of ships	331
Salvage and dismantling of wrecks	383
Construction of ports and marinas	429
Service activities incidental to water transport	522
Freight, cargo, and stevedoring	520
Renting and leasing of water transport	773

Given the obvious symmetries, work undertaken on behalf of Devon County Council and the Devon Local Nature Partnership (LNP) Advisory Group<sup>87</sup> (see table above) based on the revised 2007 SIC codes is also considered. For Dorset, all sectors have been mapped onto the 2007-based system. This results in small differences in the definition of specific sectors but these are insignificant in the context of the margins of error that can be associated with this type of exercise more generally.

The 'Devon' definition included two broad sectors that could not be defined with SIC classifications – environmental technologies (encapsulating environmental management i.e. water and sewage, renewable energy and low carbon i.e. nuclear) and the environmentally based Voluntary and Community Sector (VCS). The Devon work used expert input to define each of these sectors but did not lead to quantification in the same manner as the SIC defined industries. Elements of these two broad sectors will be contained in the approach here, but it is important to recognise that there may be some activities that will not be captured (e.g. an environmental consultancy classified as a 'professional, scientific or technical' business, is not included in our definition). Other factors such as renewables, environmental charities are implicit in our approach. Nevertheless, the broad approach is pragmatic within the remit of this study.

It is interesting that, when comparing the work undertaken in Scotland and Devon, the differences broadly relate to the points this report makes (earlier) in relation to definitions. The definition used in the Devon work is wider in the sense that:

- Extraction industries, such as mining & quarrying, are included
- The restaurant sector is included
- The construction sector is excluded
- The marine based sector is also included, although this is defined as being much wider than simply shipbuilding.

Comparison of these two similar pieces of work confirms that there is no simple definition of the 'environmental' or 'green' economy. Nevertheless, it has been useful in respect of framing such an economy for Dorset and, therefore, both sources have been used.

After this analysis, those industries/sectors that have a *reasonable*<sup>88</sup> dependency upon Dorset's environment are defined in two ways: a narrower and a wider definition. This forms the basis of a range of estimates for the *flow* of local economic activity associated with the environment.

The narrower definition is presented in the next table on a 3-digit SIC (2007) code basis<sup>89</sup>.

Dorset environmental economy – narrower definition	
Sector description	3-digit SIC code
Growing of crops and vegetables*	011
Growing of fruits*	012
Plant propagation*	013
Farming of animals*	014
Mixed farming*	015
Support activities to agriculture and post-harvest crop activities*	016
Hunting trapping and related service activities*	017
Silviculture and other forestry activities*	021

<sup>87</sup> 'Devon's Green Economy: Report on a scoping and baseline study' – Transform Research - 2012

<sup>88</sup> That is, a proportion of industry turnover is dependent upon either the quality of the environment, or utilisation of its resources.

<sup>89</sup> We have undertaken an exercise to map the 2003-based sector to the 2007 classification system.

Logging*	022
Gathering of wild growing non-wood products*	023
Support services to forestry*	024
Fishing*	031
Aquaculture*	032
Processing and preserving of meat and production of meat products	101
Processing and preserving of fish crustaceans and molluscs	102
Processing and preserving of fruit and vegetables	103
Manufacture of oils and fats	104
Manufacture of dairy products	105
Manufacture of grain mill products starches and starch products	106
Manufacture of bakery and farinaceous products	107
Manufacture of other food products	108
Manufacture of prepared animal feeds	109
Manufacture of beverages	110
Tanning and dressing of leather	151
Manufacture of footwear	152
Sawmilling and planning of wood	161
Manufacture of agricultural and forestry machinery	283
Water collection treatment and supply	360
Building of ships and boats	301
Electric power generation transmission and distribution <sup>^</sup>	351
Sewerage	370
Waste collection	381
Wholesale of agricultural raw materials and live animals	462
Wholesale of food beverages and tobacco	463
Hotels and similar accommodation	551
Holiday and other short stay accommodation	552
Camping grounds recreational vehicle parks and trailer parks	553
Other accommodation	559
Travel agency and tour operator activities	791
Other reservation service activities	799
Activities of other membership organizations n.e.c.	913

(\*) - These sectors are treated in aggregate due to a lack of more detailed data – the subsequent methodology sets out how we deal with this issue

(<sup>^</sup>) – This sector is only included in terms of the proportion for renewable energy – the subsequent methodology sets out how we deal with this issue

In terms of the wider definition, the following sectors are added to the narrower definition.

Dorset environmental economy – additional sectors in wider definition	
Sector description	3-digit SIC code
Quarrying of stone sand and clay	081
Mining and quarrying n.e.c	089
Support activities for petroleum and natural gas extraction	091
Support activities for other mining and quarrying	099
Restaurants and mobile food service activities*	561

(\*) - This sector is only included in terms of the proportion of activity that relates to the visitor economy and a further adjustment for those visiting coastal/countryside (non-urban) locations (see detail in subsequent description of methodology)

## Data analysis – Sources & Methodology:

These definitions allow the use of core data from the Annual Business Survey (ABS)<sup>90</sup>. ABS data on a detailed SIC basis is publicly available at a national (UK) level. Data at a lower geographical level has to be purchased. This study benefited from the fact that such data (at a 3-digit SIC level for Dorset County, Bournemouth and Poole combined) had previously been obtained by Dorset County Council. There remain a number of issues with using data at this level of geographical detail:

- The data is survey-based. As the business population size decreases for smaller geographies, the confidence levels associated with the data widen and interpretation of results needs more care.
- The ABS only represents partial coverage for most sectors. For some, the coverage is very limited. For example, the primary, agricultural sector is only covered by the ABS to a limited degree.
- At lower geographical levels, there can be confidentiality issues. Where there are a limited number of businesses in a certain sector, ONS tends to suppress the figures.
- The data at a sub-national level tends to be more lagged. ABS data at a UK level tends to be two-years old i.e. 2013 data is currently available. Sub-national data is lagged by one further year - 2012.

Nevertheless, the ABS data is the most robust available for this definitional exercise, particularly since it is used to produce estimates of output and intermediate consumption (and therefore GVA) at various spatial levels. Where necessary, methodological workarounds are used to produce consistent data (see below).

Where the data for a particular sector in our definition is available for Dorset, Bournemouth and Poole, measurement is captured using *approximated* Gross Value Added (aGVA). Where necessary, a number of general and sector-specific workarounds are used.

### General workarounds

1. Where data has been suppressed due to the confidentiality issues in certain sectors, ABS data at a UK level is used. Local GVA is estimated on a *pro rata* basis according to the shares of Dorset, Bournemouth and Poole in employment (against the UK equivalent) in that sector<sup>91</sup>. Effectively, employment shares act as a proxy for the share of total activity in that sector on the reasonable assumption that, in most cases, through the pressures competition, local sector productivity will match that at a national level.
2. ABS only represents partial coverage in some sectors and, as such, represents only a proportion of total GVA in an area. As a result, locally-based estimates of GVA using ABS data can under-estimate economic activity (as measured by GVA) in a local area. Looking across all sectors, for example, aGVA is between 66% and 69% of total GVA (following the National Accounts definition) due to differences in concepts, coverage and data sources. However, aGVA is a better measurement when looking at those sectors that are fully covered through the survey. For these sectors, aGVA and GVA are much closer, with GVA being between 90% and 94% of actual, total GVA<sup>92</sup>.

<sup>90</sup> Annual Business Survey – ONS

<sup>91</sup> This data is taken from the Business Register and Employment Survey (BRES) – latest data relating to 2013.

<sup>92</sup> 'A comparison between Annual Business Survey and National Accounts measures of value added' ONS, April 2014



Recognising this partial coverage issue, an adjustment to the aGVA data available at a local level is made with a factor relevant to the sector. For some sectors, the adjustment results in a *reduction* of aGVA to GVA (e.g. manufacturing sectors are adjusted by a factor of  $0.95 = 1/1.05$ ), whilst for others the adjustment results in an increase (e.g. hotel accommodation is adjusted by a factor of  $1.12 = 1/0.89$ ). The exercise adjusts the aGVA figures to a proxy measurement of GVA that will better reflect total activity. Again, this assumes that the relationship between aGVA and GVA at a local level is the same as at a national level.

3. Estimates have been uplifted to current (2015) prices using average annual inflation.

### Sector-specific workarounds:

1. As previously stated, the agricultural sector is not well covered by the ABS. For example, certain sectors (SIC 011-015 in the table above) are not covered at all. To find an estimate that is broadly consistent with other sectors, the published data of annual GVA published at NUTs3 level for the 'agriculture, forestry and fishing' sector (encapsulating SIC codes 011-032 in the above tables)<sup>93</sup> has been used. In 2012, this was estimated to be £173mn. This figure is used in our estimates.
2. To include an estimate of the economic activity associated specifically with renewable energy production and distribution i.e. a part of SIC code 351, the aGVA data for SIC code 351 has been taken (ABS data at a UK level). In the absence of ABS data at a local level (due to data suppression), a method was necessary for estimating a proportion that could, first, be attributed to Dorset, Bournemouth and Poole and, second, a proportion that could be attributed to renewables specifically.

The difficulty is that, as yet, very little electricity production takes place within the local area and using a production-based approach alone could underestimate the size of the sector. Therefore, a consumption-based approach is adopted to reflect the dependency of local residents on natural energy resources. The data shows that the combined area of Dorset, Bournemouth & Poole equated to 4.4% of total UK electricity consumption in 2013<sup>94</sup>. This is pro rated further by the fact that renewables are currently responsible for 3.5% of total energy consumption in the local area<sup>95</sup>. This gives us a proxy for GVA in the renewables sector. (Again, please remember that this effectively assumes that productivity in the renewable sector equates to productivity in the energy sector as a whole)<sup>96</sup>. Given that renewable production is still small-scale compared to production in the non-renewables sector, this may not be the case and may result in an over-estimation. Over time, however, this risk should diminish.

3. Recognising that the inclusion of the restaurants sector in the wider definition could have a distorting impact on our overall estimate (due to its relative size and the fact that it will also include a 'domestic' i.e. non-visitor element), this sector is adjusted to reflect activity more closely associated with the visitor economy. This is done by utilising tourism statistics from national tourism surveys and regional, locally based data<sup>97</sup>. All expenditure related to overnight UK and overseas visitors is included and then the proportion of day visitor expenditure that encapsulates visits to either the countryside or coast (excluding urban visits) is incorporated. The latter adjustment aims to separate expenditure that is related to the quality of the environmental asset. By making these adjustments, 72% of the restaurant sector is included in the wider definition.

<sup>93</sup> 'Regional GVA NUTS3, 1997-2013' – ONS – December 2014

<sup>94</sup> 'Regional and local authority electricity consumption statistics: 2005 to 2013' – DECC - 2015

<sup>95</sup> 'Bournemouth, Dorset and Poole Renewable Energy Progress Report' – Dorset Energy Partnership – February 2015

<sup>96</sup> Another methodological difficulty with this approach is the fact that it combines measurements of production (aGVA) with a proxy for consumption. An alternative approach would be to use a proxy such as population, or emissions from energy production (both of which broadly equate to 1.2%), leading to a lower overall estimate.

<sup>97</sup> 'The Economic Impact of Dorset's Visitor Economy 2013' – South West Research Company – November 2014

## Direct Estimates of the Environmental Economy:

Based on the approach outlined above, the *direct* value of the Dorset environmental economy is estimated at between £1bn and £1.2bn (2013 prices). The lower estimate within the range is based on the narrower definition, whilst the upper end of the range is based on the wider definition. To reiterate, this estimate represents *economic flows* associated with Dorset's environmental economy. That is, this estimate of Dorset's environmental economy is based on on-going economic activity dependent (in varying degrees) upon the *quality* of the environment, as well as the *utilisation* of environmental resources.

To provide context, this equates to circa 7%-8% of total Dorset economic output<sup>98</sup>. This is broadly comparable to other studies undertaken elsewhere (although all done on different methodological basis), within a range of between 2%-16%<sup>99</sup>. (N.B. Studies at the top end of the range have tended to add both direct and wider indirect estimates - as we do in our later analysis).

It is also important to recognise that these estimates could be at the top end of overall estimates because they fundamentally reflect *all* economic activity in those defined sectors – not *just* that activity that relates specifically to the dependency upon local resources. Our adopted definition is narrower than used in some studies. There are sectors – such as primary agriculture – where the economic activity will almost *wholly* depend on local environmental resources. However, there are others – such as some food manufacturing that use significant imported materials as well as those locally sourced. (Remember, the defined sectors meet a minimum threshold of dependency upon the local environment but are not totally dependent upon that environmental resource.)

Nevertheless, the range produced looks 'reasonable' in the context of the overall size of the Dorset, Bournemouth and Poole economies, as well as the top-down estimates contained elsewhere in this report.

On reviewing the estimates for the specific sectors, a number of issues need highlighting:

*The estimate of the contribution of the extraction industries (including petroleum and gas exploration) look relatively small, particularly in the context of some coastal/offshore oil & gas activity and stone quarrying in the area. This was one sector where the 'employment share proxy' approach was used (point 1 in the general workaround) due to data suppression issues. It could be that much of the employment in these sectors at a national level is associated with 'head office' effects, and on-site employment could be temporary - therefore local employment is relatively minor. As a result, the estimate of GVA associated with these sectors is also relatively small. The same argument might apply to water treatment and supply (Wessex Water being based in Bath), although these estimates seem more 'reasonable'.*

In terms of employment, the **Dorset environmental economy** as here defined, *directly* supports between 19,200-27,200 jobs in the Dorset, Bournemouth & Poole economies<sup>100</sup>. Again, this represents a range of 6%-9% of total employment in those areas. The *absolute* numbers may be seen as an under-estimate because the source survey data does not capture all self-employment and does not wholly capture agricultural employment, although the *proportional* share would be expected to remain broadly similar given that the same factors would also affect the wider economy.

## Indirect Estimates of Impact:

The previous section estimates the impact of the environmental economy in terms of its *direct* impact. It is also important to consider the wider *indirect* impact of the sectors defined through their own demand for products and services in the wider economy, as well as the additional economic activity supported through the wage spend of sector employees.

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<sup>98</sup> Estimated by placing our estimate against the ONS published GVA for Dorset, Bournemouth & Poole (circa £14.9bn in 2012).

<sup>99</sup> Areas include Wales, Scotland, South East England, North West England, South West England and Devon

<sup>100</sup> This data is taken from the Business Register and Employment Survey 2014 - ONS

These wider impacts are normally derived by the use of relevant multipliers to assess the dynamic impact of an industry (or industries in this case). There are broadly two different types of multipliers, the narrower Type I multiplier captures the *direct* effect of expenditure on an industry (as already estimated above) and the *indirect* effects on suppliers of inputs to that industry. The wider Type II multiplier also captures the additional induced effects from changes in incomes and spending i.e. the benefit from spending in the local economy by sector workers (the household spending effect). Multipliers can be used in an output and an employment context.

In an ideal world, the strength of the multiplier effect should be estimated using empirical data i.e. mapping where a certain industry purchases its inputs from the supply chain and the geographical location of those suppliers. This is, however, a resource-intensive and lengthy exercise that, sometimes, yields marginal benefits. Therefore, impact studies tend to use published multipliers from a number of previous empirical sources based on a modelled input-output framework. (Input-output tables are a matrix of goods and services flows between industries and consumers at a particular point in time, showing how changes in one sector will affect other sectors.)<sup>101</sup>

To date, at a national level, input-output tables are produced by the ONS. They have not produced them at a sub-national level<sup>102</sup>. The UK framework can be used, however to understand the wider impact of the 'environmental economy' – as previously defined.

A crucial consideration is that the environmental economy is a major source of its own input demand and this needs to be excluded from estimates of the wider multiplier impact. Not excluding 'intra-sector' demand would mean double counting and an over-estimate of the wider impact. As an illustration, most food manufacturers' input demand comes from the primary agricultural sector. Since both sectors are included in the definition of the environmental economy, simply applying a multiplier ratio to food manufacturing to estimate the wider impact would overstate the impact of the environmental economy.

Using the UK input-output tables<sup>103</sup>, the proportion of input demand that the environmental economy makes from 'itself' can be estimated, as well as the proportion of demand from other sectors outside of the environmental economy. By making this separation, the level of demand in the wider (non-environmental) economy can be identified.

Analysis of the UK input-output tables shows us that, using our estimates across all industries<sup>104</sup>, the average output multiplier equates to 1.5. This represents a Type I multiplier i.e. it captures supply chain impacts. That is, every £1 of activity results in a stimulus to the whole economy of £1.50 of spending (including itself).

Analysis of those sectors defined as being in the environmental economy actually shows that they have a more significant supply chain impact than this average. For those sectors in this definition, in aggregate, the multiplier is stronger at 1.8. Next, the proportion *within* the environmental economy itself is excluded and a revised multiplier found<sup>105</sup>.

On this revised basis, of the overall impact of 1.8 in the whole economy 1.4 is accounted for by impacts *within* the environmental economy (effectively 1 represents the direct impact already estimated and 0.4 of the whole multiplier represents impact in those sectors outside of the environmental economy. That is, for every £1 change in demand (which in this report - in accordance with standard practice - is assumed to

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<sup>101</sup> If funded, the previously mentioned Bournemouth University work on modeling the Dorset economy, including environmental assets and flows, will adopt this approach.

<sup>102</sup> Although some private/academic sector suppliers have constructed versions for various regions/areas.

<sup>103</sup> UK Input-Output Analytical tables – Detailed, 2010' – ONS – February 2014

<sup>104</sup> Defined in the table as 2-digit SIC code

<sup>105</sup> Multipliers are effectively derived using a Leontief Inverse matrix  $(I-A)^{-1}$  showing output rises in each sector due to the unit increase in final demand. A is an input-coefficient matrix from the input-output table.

equal output), there will be a further impact of 40p in those sectors outside the environmental economy: in effect, 40% of the indirect impact takes place outside of the environmental economy.

Thus far, we have worked with the UK input-output tables. Multiplier ratios, however, tend to be smaller at a lower geography as more input demand takes place outside of the local target area. Therefore, the '40p in the £' multiplier impact should be seen as the top end of estimated range.

Analysis of multipliers derived from input-output tables produced on behalf of the Scottish Government<sup>106</sup> show a corresponding Type I multiplier of 1.35 across all industries. Comparing this to the multiplier of 1.5 at a UK level begins to show how the wider impact weakens as the geographical area reduces. To make an adjustment to a Dorset level, our informed judgement is that a ratio of 1.2 (0.2) is appropriate<sup>107</sup>. This lower figure reflects the relatively small geographical extent of Dorset and the limited local supply chain in some industries.

A final adjustment is then made to consider the induced (household spending) effect – converting Type I multiplier into Type II. Various sources<sup>108</sup> indicate that the induced impact is broadly 50% of the extent of the indirect impact. Therefore, the total indirect (0.2) and induced (0.1) Type II multiplier is 0.3.

This forms the basis for an estimate of the wider indirect impact of the environmental economy on the other sectors in the Dorset economy. For simplicity, the strength of the output and employment multipliers are assumed to be the same, although in reality they tend to differ slightly according to the capital/labour intensity of the particular industries included in the definition. Overall, it is assumed the capital intensive and labour intensive sectors cancel each other out.

Applying these multiplier ratios to understand the impact upon the wider (non-environmental) economy means that we estimate that the *direct* and *indirect* impact of the **Dorset environmental economy** equates to a range of £1.3bn-£1.5bn – representing between 9%-10% of total economic output. This is broadly comparable to the outcome of the Scottish study cited earlier which, by also including the indirect impact of the environmental economy estimated its value to be circa 11% of total economic output.

In terms of employment, our estimate is that the **Dorset environmental economy** *directly* and *indirectly* supports between 25,000-35,000 jobs – representing between 8%-11% of total local jobs.

## Sector Conclusion

This sector based approach has used modified SIC definitions and appropriate adjustments, including local multiplier effects, to find output (GVA) and employment (FTE) scales for the Dorset Environmental Economy for two definitions. The narrower definition finds £1.3bn GVA and 25,000 FTEs whereas the broader definition finds £1.5bn GVA and 35,000 FTEs.

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<sup>106</sup> 'Scottish Enterprise Input-Output tables' – 2012 – Scottish Enterprise. We would prefer to have used the more appropriate SW Regional Accounts but these have not been updated/revised following the demise of the SW Regional Development Agency that funded the work.

<sup>107</sup> This was corroborated through the use of the historical South West Regional Accounts. This shows that the Type II multiplier for Dorset was approximately 85% of the multiplier for the South West – a region broadly comparable to Scotland in terms of the size of its population and economy.

<sup>108</sup> Including the Scottish Enterprise model and the South West Regional Accounts

## Contextual Afterword

Dorset County Council (DCC), with its designated partners, has appointed a team of experts, led by Ash Futures, to produce a detailed study of Dorset's Environmental Economy. This provides a detailed benchmark of the relationship between the environment, economic growth and social wellbeing. It also reviews the potential of the partners to capture more value from the environmental assets within their various boundaries.

The report is intended to influence strategy, policy and delivery of economic interventions between and amongst Dorset's development partners. By recognising the inherent and development value of the local environment to the process of economic growth, it will influence decision-making across the county, including both the two Bournemouth and Poole unitary areas and the six districts making up 'Dorset County'.

In particular, with respect to the **Dorset environmental economy** as a whole (and, within that, the two main designations of the Dorset Area of Outstanding Natural Beauty (AONB) and the World Heritage Site (WHS) of the 'Jurassic Coast', including East Devon), it aims to establish a more accurate understanding of the qualitative and quantitative aspects of economic value that are and can be provided.

As part of the wider team, Strategic Economics Ltd with support from Vallance Economics, was asked to define and describe the **Dorset's Environmental Economy**, establishing the economic context for the area and the extent of its economic importance through a range of aggregate valuations. This report provides that analysis.

Strategic Economics and Vallance Economics have used their professional experience and expertise to provide this report, which was compiled from sources and intelligence available up to the end of October 2015. The companies and their authors cannot be held responsible for any errors or omissions revealed by future data revisions, new publications or policy changes or, in **Dorset's Environmental Economy**, for the consequences of actions taken by the client, its stakeholders and partners on the basis of the report as it stands.