

Financing One Coast: A review of possible finance mechanisms for the One Coast Project

010 SWEEP



1. Introduction

The One Coast project is a landscape scale conservation initiative which aims to create a continuous nature rich and accessible coastal corridor in the SW, for the benefit of nature and people. The coastal corridor is defined as the continual strip of land stretching from Mean High Water 1km inland around the entire SW Coast. The landscape scale ambitions of the One Coast project require careful consideration of possible sources of finance, including consideration of new and innovative finance mechanisms and the establishment of a One Coast investment plan.

This review outlines a range of possible finance mechanisms that could be used for the One Coast project, alongside traditional grant and philanthropic sources of finance. It represents the first step towards the development of a strategic plan and investment plan for the One Coast project. The review is restricted to the area of the coastal corridor which lies within Cornwall and is informed by the accompanying One Coast Evidence Base (2019). A range of possible finance mechanisms relevant to the One Coast project area are briefly described, accompanied by a review of their relevance for the One Coast project. The aim of this review is to present a range of possible options for consideration by the National Trust and the RSPB.

2. Finance Mechanisms

A finance mechanism simply refers to a method or source through which finance is made available. In the UK, nature conservation initiatives have traditionally been financed through public finance (budget allocations, grants or payments to land owners) or philanthropic donations. Since 2010 there has been a growing focus on new and innovative sources of private finance for nature conservation, driven by a decrease in the availability of public finance (Somper 2011¹) and a realisation of the need to upscale conservation initiatives to meet national and international targets to halt biodiversity decline (Parker et al. 2012²). Alongside traditional grant programmes, there are now a diversity of mechanisms which can be used to generate finance for nature conservation, from Payments for Ecosystem Services to Visitor Taxes, Biodiversity Net Gain and Green Bonds (Parker et al. 2012). Many of these emerging finance mechanisms focus on tapping into private finance and employ market-based approaches.

The rise of private and market-based approaches to conservation finance has sought to expand the pool of potential investors in nature conservation, to include corporates, impact investors, institutional investors and retail investors. However, implementing emerging market-based finance mechanisms is a new challenge for the conservation sector. Although private investment can sit alongside traditional forms of funding (e.g. government or local authority budget allocations, philanthropic grants, corporate and private donations etc), it often requires the conservation sector to not only generate positive outcomes for nature but also a reliable long-term return on investment. Generating reliable revenue streams from natural capital is challenging as many parts of society already receive benefits [ecosystem goods and services] free of charge. Private investment in natural capital is, therefore, often based on identifying opportunities where revenues or cost saving could be delivered through improving the natural environment.

3. Linking the One Coast Evidence Base and Possible Financial Mechanisms

The One Coast Evidence Base highlights a number of features of the coastal corridor that could help shape the choice of financial mechanisms used for the One Coast project. Features identified in the One Coast Evidence Base with a connection to a possible finance mechanism are briefly described below, prior to more detailed analysis in Section 4.

One of the most immediately striking aspects of Cornwall's coastal corridor is its high number of usual residents. An estimated 37% of Cornwall's total population is thought to reside in the coastal corridor, resulting in a population density more than twice that of the rest of Cornwall. The high number of usual residents emphasises the desirability of the coastal corridor as a place to live and work. The large population also means that there is potentially a large number of people with a high level of place attachment or sense of place linked to living and working in the coastal corridor. Place attachment could be a key driver for the development of community-based action focused on enhancing the coastal corridor in which so many people already live and work. Community based actions which could be facilitated by the project partners include the potential set up and development of a network of community land purchase schemes along the coastal corridor, community action funds and even SEED funds for community trusts. Notably, the population of the coastal corridor is potentially wealthier than much of the rest of Cornwall, with a higher proportion of usual residents

¹ Somper, J., 2011. *Funding trends – the implications for future nature conservation*. ECOS Spring, pp.32, 1, 34-42. Available at: <https://www.banc.org.uk/ecos-32-1-spring-2011-funding-trends-the-implications-for-future-nature-conservation-jonathan-somper/> [Accessed June 22, 2019].

² Parker, C. et al., 2012. *The Little Biodiversity Finance Book: a guide to proactive investment in natural capital (PINC)* 3rd ed., Oxford: Global Canopy Programme. Available at: [http://globalcanopy.org/sites/default/files/documents/resources/LittleBiodiversityFinanceBook_3rd edition.pdf](http://globalcanopy.org/sites/default/files/documents/resources/LittleBiodiversityFinanceBook_3rd%20edition.pdf).

in professional, technical, senior and managerial roles, in the coastal corridor, and average house prices some 27% higher than the rest of Cornwall. The presence of high net worth individuals could be a key source of private donations for the coastal corridor and set up or development capital for community-based action. Furthermore, there is a much higher proportion of residents over 65 and retirees living in the coast corridor compared to the rest of Cornwall. Choosing to retire to the coastal corridor is another indication of the high potential level of place attachment of residents, and also indicates a high potential for legacies linked to enhancing and improving the coastal corridor.

Not only are there a higher number of residents in the coastal corridor but there is also increasingly an ageing population, with predictions that by 2030 some 31% of the population of Cornwall will be over 65. An ageing population is likely to place a much higher demand on services such as health and care provision and is likely to drive a shift towards a more service and care driven economy. There is an ever-growing evidence base supporting the beneficial health effects of spending time in natural environments. Coastal environments are no exception, Wheeler et al. (2012³) found that populations living near the coast in England are healthier than those inland (Wheeler et al. 2012) and longitudinal data suggest that individuals are healthier during periods when they live closer to the coast (White et al. 2013⁴). The health benefits of coastal environments are thought particularly to be linked to increased opportunities for recreation (Wheeler et al 2012, White et al. 2013). Using the ORVal tool⁵, the One Coast Evidence Base indicates that the Coastal Corridor is already likely to be a key location for recreation, with 49% of total predicted recreational visits by adult residents to greenspaces in Cornwall taking place in the coastal corridor (18.64 million), with an associated welfare benefit to residents of £74 million [51% of the total value of welfare benefits to residents from recreational visits to greenspaces in Cornwall] (Day and Smith 2018⁶). Both the prospective health and care demands of an increasingly ageing population and the recreational value of the coastal corridor point to the potential use of health or recreation-based schemes to fund enhancements of the coastal corridor close to urban areas, also known as social prescribing. Social prescribing has already been established in some areas of Cornwall through the Dose of Nature project⁷, and has the potential to be further developed through the One Coast project or targeted to project partner areas in the coastal corridor. Notably, the health benefits of the coastal environment are thought to be particularly significant for reducing health inequalities faced by deprived communities, and therefore any further development of a social prescribing system could be targeted at the neighbourhoods suffering from the highest levels of deprivation in the coastal corridor (see One Coast Evidence Base, Section 2.10).

The coastal corridor is a key area for real estate development and construction. The Cornwall Site Allocations Development Plan Document (Allocations DPD) identifies where new housing and employment uses are planned across Cornwall. Based on Cornwall Council's Site Allocation Development Plan, some 36% of all 'allocation sites' (by area) lie within or intersect the coastal corridor. Based on estimated dwelling numbers for housing-based allocations, 50% of allocated dwellings will be in sites that intersect or lie within the coastal corridor. The concentration of future development within or close to the coastal corridor could place further pressure on its natural capital assets, with a particular concern around impacts on the mobility of coastal margin habitats and the loss of rare semi-natural grasslands. However, development on more commonplace habitats could be an opportunity to help finance the One Coast Project through the delivery of off-site biodiversity net gain requirements. The preference for the delivery of biodiversity net gain will always be on-site, however, there are some cases where developments will not be able to deliver biodiversity net gain within their development footprints despite adhering to the mitigation hierarchy. Where off-site compensation is deemed appropriate by the Local Planning Authority it can take place either through bespoke offsetting, where developers engage a third party to deliver offsite compensation, or via an in-lieu fees approach, where a defined contribution is collected and then distributed to delivery partners to undertake an offset on the behalf of the Council/developer. Cornwall Council is currently developing a local net gain framework, which is proposed for rollout in September 2019 and is likely to be mandated by January 2020 for all major developments. Under the Cornwall Net Gain framework, there is likely to be a strong preference for compensation sites that are close to the development or impact site. This is likely to be defined as within the same sub-catchment as the development or impact site. Given the concentration of allocated developments within the coastal corridor, there is a clear argument for also locating off-site compensation sites, or offsets, within the coastal corridor. Net gain frameworks could potentially provide both capital and 30 years of maintenance and management costs for habitat creation but will require proactive identification of viable and cost-effective delivery sites, ideally close to potential impact sites.

Some 44% of Cornwall's enterprises are estimated to be located in the coastal corridor, including 25 businesses with over 250 employees. Many corporations are increasingly conscious of environmental and social issues, particularly customer or citizen facing

³ Wheeler et al (2012) Does living by the coast improve health and wellbeing? *Health Place*, 18(5). 1198-1201. doi: 10.1016/j.healthplace.2012.06.015.

⁴ White et al (2013). Coastal proximity, health and well-being: results from a longitudinal panel survey. *Health Place*; 23:97-103.

⁵ <https://www.exeter.ac.uk/leep/research/orval/>

⁶ Day, and Smith (2018). *Outdoor Recreation Valuation (ORVal) User Guide: Version 2.0. Land, Environment, Economics and Policy (LEEP) Institute, Business School, University of Exeter.*

⁷ <https://www.adoseofnature.net/>

corporates with an interest in cultivating an image of Corporate Social Responsibility (CSR) and environmental concern. A corporation's environmental or sustainability strategy can include a commitment to offset carbon emissions or to invest locally in environmental or social projects such as One Coast. There are a number of initiatives to encourage environmentally friendly economic growth nationally, while locally the TEVI project, an EU funded collaboration between Cornwall Council, the Cornwall Development Company, Cornwall Wildlife Trust and the University of Exeter, is helping a range of enterprises to achieve green growth. Some 40% of the 100+ businesses engaged with the TEVI project are located in the coastal corridor. Following models such as the RSPB Energy for Nature Scheme and the Woodland Trust's Smithills Estate, Bolton, the TEVI network could be a key source of expertise and business investment to enable the development of Natural Capital Based Ventures to help finance conservation across the coastal corridor. In addition, some enterprises have clear dependencies or impacts on natural capital and are more likely to be willing to engage, participate and invest in environmental projects in the coastal corridor to generate environmental improvements and demonstrate environmental credentials. Sectors with considerable natural capital dependencies include agriculture, aquaculture, fisheries, forest products, utilities, and mining. There is an increasing number of tools available which highlight the dependencies of different industries or sectors on natural capital (e.g. ENCORE⁸). Furthermore, large agri-food industries and the tourism industry rely on the green and pleasant image of Cornwall to brand and market their products. One route to investment could also be to target companies which brand products linked to the aesthetic and cultural value of Cornwall's natural or coastal environment, and could have a much stronger business case for investing in the coastal corridor.

The tourism industry is a main driver of the Cornish economy, and it is also a sector which is *"inextricably linked to Cornwall's unique environment, including its coastline and cultural heritage"* (Cornwall Council 2012⁹). Some 53% of tourist sites lie within or intersect the coastal corridor. An estimated 5.34 million day/staying visits per year are made to coastal areas in Cornwall (28% of total) (SWRC 2016¹⁰, 2018¹¹). Conservative estimates suggest that the coastal corridor, excluding beaches and coastal resorts, receive an estimated 2.26 visitors per year (SWRC 2016¹²), however, this number could be as high as 14.88 million visitors per year (SWRC 2016). Coastal areas are estimated to be linked to a tourist spend of around £666 million per year, and the coastal corridor an estimated £178 million per year, equating to on average 10% of the total visitor spend in Cornwall and 26% of coastal spend (SWRC 2016, 2018¹³). Both the volume of visitor numbers and the visitor spend highlight the potential for the use of a county-wide visitor tax or voluntary visitor giving scheme to help fund the One Coast project. The Council is already investigating the introduction of a visitor tax at the county scale, and a VP scheme linked to the coastal corridor could be developed in conjunction with the South West Coast Path Association.

Enclosed grasslands and farmlands dominate the coastal corridor (64%). This dominance means that any effort to create a nature-rich and accessible coastal corridor needs to consider approaches for enhancing agricultural land for biodiversity and multiple ecosystem service provision. An estimated 372 farmers (8.2% of the total estimated farms) have land intersecting or within the coastal corridor, currently supported by around £9,723,000 per year basic payment schemes. Agri-Environment agreements currently cover some 13,916 ha of the coastal corridor, with a total annual value to agreement holders of £1.597 million (an average of £115/per ha). Enclosed grasslands, including arable and horticultural areas and improved grassland, have considerable potential to deliver ecosystem services. The highest potential for the delivery of ecosystem services is likely to be reduced soil erosion by wind and water, improvements in bathing water quality, carbon storage and sequestration, biodiversity and pollination services, with more limited areas with potential to aid flood mitigation and freshwater quality improvements. In partnership with the Council, the tourism industry, the Environment Agency and SW water utilities, targeted wetland, coastal margins or woodland habitat creation could be used to try to improve bathing water quality, reduce flood risk and sequester carbon. The set-up of specific Payments for Ecosystem Services schemes linked to soil erosion, bathing water quality, or carbon storage and sequestration could be a key pathway to encourage environmental improvement in the One Coast project areas. Alternatively, enhancing species richness could be encouraged through the piloting of a dedicated result based agricultural scheme targeted to provide bonus payments for coastal corridor farmers where they provide nature rich environments close to coastal margins or undertake land sparing close to the coastal path. One final option is the development of a certification scheme focused specifically on farmers in the One Coast area, much like for the RSPCA welfare standard for salmon farmers, the certification scheme could provide added recognition for coastal farmers delivering environmental enhancements. A certification approach could be of particular interest for corporates in the agri-food

⁸ <https://www.investmentweek.co.uk/investment-week/news/3067084/encore-new-tool-to-highlight-natural-capital-risks-for-investors>; <https://encore.naturalcapital.finance/en/data-and-methodology/methodology>

⁹ Cornwall Council (2012) Economy and Culture Strategy Evidence Base - <https://www.cornwall.gov.uk/media/3624007/Economy-and-Culture-Strategy-Evidence-Base.pdf>

¹⁰ Please note that these data exclude regular non-tourism related residential use such as dog walking.

¹¹ SWRC (2018) Cornwall Visitor Survey 2018/19 Quarterly update, Produced on behalf of Visit Cornwall.

¹² SWRC (2016) SW Coast Path Monitoring and Evaluation Framework, Year 5 (2015) Key Findings, Produced on behalf of the SW Coast Path Team.

¹³ Observatory of the Cornwall Marine Leisure Industry Draft in preparation 2010. Nautisme Espace Atlantique Project, Cornwall Development Company.

industry who specifically market their products based on the aesthetic and environmentally friendly image of Cornwall (e.g. Davidstow Cheddar¹⁴).

Finally, woodlands cover some 11% of the coastal corridor. Woodlands contribute to the corridor's high potential for above ground carbon storage, potential to provide water quality and quantity mitigation, provide opportunities for recreation, air quality amelioration and noise mitigation. There are a variety of existing approaches that could help fund further woodland creation across the coastal corridor. One route could be to use the Woodland Carbon Fund or Voluntary Carbon Offsets to provide an additional stream of finance and cover set up and capital costs of woodland creation; this finance could potentially be bundled with net gain finance to provide more attractive prospects for land owners. Transport and logistics firms linked to Cornwall with high carbon footprints could be targeted for voluntary carbon offsets, as well as large-scale enterprises. However further investigation is required to understand current levels of interest in investing in local voluntary woodland carbon offsets and the potential returns on investment. Notably, woodland creation is high on Cornwall Council's agenda, as a response to the declaration of a current climate emergency and linked to initiatives such as the Forest for Cornwall (*Cornwall Council pers comm*). The development of new woodlands for biodiversity and profit could be undertaken in partnership with established bodies in the sector, such as Forest Carbon, the Forestry Commission and the Woodland Trust.

¹⁴ <https://www.davidstowcheddar.co.uk/>

4. Finance Mechanisms

4.01 Transient Visitor Levy and Visitor Giving Schemes

Transient Visitor Levy

More and more countries, including the majority of European member states, have some kind of tourist tax or a Transient Visitor Levy (TVL) linked to combating the problems caused by over-tourism. A range of taxes can be included under the label tourist taxes, including specific corporate income tax and VAT. A Transient Visitor Levy (TVL) is a specific occupancy-based tax levied on short-term stays and typically charged per person per night. TVLs generally consist of a small night-based fee of between £1 to £5 across Europe. For example, the Balearics Sustainable Tourism Tax was introduced in 2016 to aid environmental and tourist improvements, is collected when tourists arrive at their accommodation, and can range from 1-4 euros per night depending on the quality of accommodation, peak or off-peak season and length of stay. In general, TVLs are designed to offset the impact of tourists on local infrastructure and services, the tax income is most often used for funding infrastructure and essential services affected by tourism, including road maintenance, policing, facilities and also to support the future growth of tourism. TVLs are generally collected when tourists arrive or leave their accommodation. As tax rates can be varied based on the standard of accommodation (star rating), location, visitor age and season, there is significant capacity for Local Authority discretion in the application of a TVL.

In the UK, Scotland is currently leading the way in the introduction of TVLs. From 2021 Scottish Councils will be able to levy a tourist tax. The proposals for Edinburgh are for a £2 a night occupancy tax, which received strong support from local residents but more negative feedback, as to be expected, from the tourism industry. At present Local Authorities (LAs) in England are not allowed to raise money through TVLs. However, over recent years a number of city councils and LAs in England have pushed for new powers to be able to introduce tourist taxes to offset funding cuts, including Bath, North East Somerset Council, Liverpool, Birmingham and York. In particular, Bath and North East Somerset Council have made formal lobby to the government for the power to charge visitors a tourist tax, specifically to introduce a £1 per night levy on hotels and holiday lets. Birmingham City Council has proposed the introduction of a levy on visitors to pay for the 2022 Commonwealth Games, while Liverpool city councillors have pushed for a voluntary tourist tax for cultural events.

In Cornwall, the idea of introducing a TVL was raised in early 2019 by Cornwall Council and is currently being investigated by the Council in coordination with other LAs. Cornwall Council estimates that an extra £25 million could be raised through the introduction of a £1 a night tax on overnight staying guests. The council proposals currently suggest that tax revenue could be used to finance infrastructure maintenance and improve the tourist experience. The introduction of the TVL is outlined as a potential mechanism to perform infrastructure maintenance, as the number of visitors in the county increases. The aim of the fund would be to also improve the tourist experience.

Opportunities

The One Coast Evidence Base highlights the significance of the coastal corridor for the tourism industry in Cornwall. With an estimated, 2.26 million visitors per year (with higher estimates reaching 14 million), responsible for around £178 million of visitor spend (SWRC 2016; 2018). The significance of the coastal corridor for the Cornish tourism industry and the volume of visitors means that consideration must be given to the potential for the tourism sector to help finance the One Coast project, either via a Transient Visitor Levy (tourist tax) and/or a Voluntary Visitor Giving Scheme. Tourist taxes are a response to the pressure high levels of tourism places on local infrastructure and services. The One Coast Evidence Base clearly indicated that the tourism industry derives significant value from the coastal corridor and in turn, the natural capital assets in the coastal corridor are disproportionately under pressure in terms of recreational sites and visits compared to the rest of Cornwall (One Coast Evidence Base 3.03.01). There is a strong argument that any investments made in improving physical infrastructure could also be extended to apply to improving the natural capital assets and resilience of the coastal corridor. Investing in restoring the coastal corridor would be a chance for both visitors and the tourism industry to support a key source of their enjoyment (visitors) and income (tourist industry). Investing in the coastal corridor would also be a positive action for the Council as this would support the future growth potential and resilience of the Cornish Tourism industry and could encourage increased visitor numbers. The TVL would reflect the true cost of tourism in terms of recreational pressure on the coastal corridor and the need for the tourism industry to invest for its future.

The One Coast partner organisations could take a number of actions to encourage the development of a local TVL:

1. Partner with large tourist organisations such as Airbnb, booking.com etc, to trial the introduction of a TVL directly linked to investing in the coastal corridor.
2. Introduce a specific TVL for National Trust holiday accommodation.
3. Support and highlight the need for a TVL to Cornwall Council, and specifically emphasise the need to allocate revenue from the tax towards natural capital investment in the coastal corridor as a means to invest in the future development of the tourism industry.

Issues or Challenges

In general, research and consultation on the introduction of TVLs in the UK has received considerable support from local residents but more negative reaction from the tourist industry. There are also a number of common concerns surrounding the introduction of a TVL. In particular, there are concerns that collection could prove difficult and that the tax would be off-putting to tourists. The tourist lobby, for example, the Cornwall Federation of Small Businesses, are not likely to support the introduction of a TVL. There are also concerns regarding how the tax revenue will be reinvested in the area, and the potential losses through administration expenses and enforcement outweighing the benefits.

Voluntary Visitor Payback

In comparison to an involuntary TVL, Visitor Payback (VP) involves the voluntary process of visitors choosing to give money (or other help) to assist in the conservation or management of places they visit. VP is an entirely voluntary payment that directly connects the visitor to specific conservation projects, thereby heightening their own tourist experience. Under a VP system, visitors are paying voluntarily for the maintenance and enhancement of particular ecosystem services which they value. A variety of techniques can be used in the pursuit of VP, including donations, opt out/opt in levies, merchandising, membership, participation, fundraising, sponsorship and loyalty cards. VP schemes are increasingly being promoted as additional sources of finance for landscape scale conservation schemes and included by Defra under the label of Payments for Ecosystem Services.

A review by Reed et al. (2013) identified twenty-two active VP schemes in the UK, with an average amount donated of £3.45. In general, Reed et al. (2013) found that the main benefits of VP were increased awareness, education and promotion of the conservation project, but warned that they may not always generate significant revenue and can often have high administration costs. The income potential of VP schemes should therefore not be seen as the be all and end all, as VP often do not provide a means of delivering substantive revenue. Caution should be taken in introducing a VP to ensure that there is not a perception that the countryside is becoming over commercialised. Balancing administration costs and donation level is also key. There can also be some inherent negativity around the use of the phrase visitor 'payback', as this implies visitors cause damage and this requires compensation. More successful schemes have focused on giving and investment in an area to return to. VP schemes also require a strong partnership between the tourism industry, conservation organisations and visitors, and therefore partnership with Visit Cornwall may be crucial.

In relation to landscape scale restoration projects, such as the One Coast project, research demonstrates that VP is generally most successful when:

- Visitors can contribute towards specific projects that deliver tangible, measurable benefits to society.
- It enables visitors to give towards the preservation of a specific targeted area they visit - Prioritise local projects and seek funding from visitors only when they visit the area local to the project.
- Where scheme offers multiple investment options targeted towards different visitor profiles, relevant to their interests.
- Where schemes offer a range of different payment methods e.g. smart phone apps, donation boxes or opt in levies.
- Visitors can donate quickly and easily; this characteristic should, therefore, be paramount in the design of the payment method of VP.
- There is good marketing, particularly online and social media-based marketing.
- There is a range of projects to contribute to.
- Positive language focuses on investment.
- There are minimal running costs.

- There is immediate feedback on the effect of individual donations, demonstrating the benefits and making it clear that other visitors are also donating.

Options for payment methods

- Smart phone apps
- Donation boxes on-site
- Payment by text
- Opt-in levies on accommodation/ voluntary levies on services e.g. car parking
- Merchandising with a proportion of the income being given to a conservation project

Box 1. Options for VP payment mechanisms

Case studies

Nurture Lakeland

The Nurture Lakeland¹⁵ pilot PES project, started in 2010, developed a VP scheme for conservation and tourism organisation in the Lake District National Park. Nurture Lakeland represents over 1,200 individual businesses, from small guest houses to large hotels, holiday cottages, conservation bodies and other tourism related businesses. Visitors are given the option to invest in a range of specific ecosystem services specifically linked to certain walking and cycling routes in a smart phone app or on the website, such as peatland restoration or the creation of a bee/butterfly corridor; there are also options to offset carbon emissions per mile travelled by car. Since 2010, VP has raised over £2 million for conservation projects. The scheme made use of existing apps such as the Nurture Lakeland sustainable transport app. The findings of the Nurture Lakeland VP pilot project were included in the development of a best practice guide and a VP toolkit developed by Visit England¹⁶.

Caring for the Cotswolds, Cotswolds AONB

Caring for the Cotswolds¹⁷ is a VP scheme whereby businesses ask visitors to voluntarily support local conservation projects by donating small amounts of money via their bill or fees, and these funds are then collected for local environmental projects. Caring for the Cotswolds is a joint initiative with the tourism industry and based on the premise that visitors may wish to contribute towards the conservation of the place they have come to visit. The revenue is then distributed through a grant scheme, with grant levels between £500 to £2500.

Opportunities

VP schemes are well suited to the One Coast project as VP schemes are thought to be most successful when visitors can contribute towards a specific project that is delivering tangible benefits to an area they visited. VP schemes are also a resource mobilisation technique that both of the One Coast project partners are already well accustomed to and are well suited to upscaling using in-house expertise. VP also represents an awareness raising opportunity to help highlight the need for finance for the One Coast project. Furthermore, VP avoids the perception of a 'bed or visitor tax' and is more likely to be accepted and embraced by the tourism industry. However, at present VP schemes within the National Trust are generally locally tailored, individually focused and small scale generating minimal scale finance (*NT pers comm*). The VP schemes which have developed have focused on developing individual partnerships with targeted hotels or local businesses. To upscale VP for the One Coast project, there is a clear need to achieve sign-up of a large number of businesses, as set out in the Caring for the Cotswolds and Nurture Lakeland case studies. The development of the scheme may be reliant on one-off grant aid to kick start the project and a percentage of collected finance reinvested to support long term viability of the scheme. Key partners for the development of VP include Visit Cornwall, the SW Coastal Path Association and the Cornwall AONB.

¹⁵ <http://www.nurturelakeland.co.uk/>

¹⁶ https://www.visitengland.com/sites/default/files/downloads/visitor_giving_helpsheets.pdf

¹⁷ <https://www.cotswoldsaonb.org.uk/looking-after/caring-for-the-cotswolds/>

Issues

Successful VP schemes indicate the need to show specific links and benefits, targeting donations clearly towards specific projects and demonstrating how donations will lead to measurable ecosystem services benefits which could lead to the restricted use of funds. The amount of finance generated through VP is influenced by wider economic circumstances and trends, with visitors less inclined to donate when the economy is poor. The individual amount donated through VP tends to be low and can suffer from high administration costs. Set up of a coastal corridor wide scheme would require a considerable initial investment in start-up and marketing.

Linked resources and guidance

Reed et al. (2013) Visitor Giving Payment for Ecosystem Service Pilot Final Report, Defra, London.
http://randd.defra.gov.uk/Document.aspx?Document=11917_VGSPESPilotFinalReportFeb14.pdf

Visit England (2012) Visitor payback toolkit, Available at:
https://www.visitengland.com/sites/default/files/downloads/visitor_giving_helpsheets.pdf

4.02 Community Land Trusts and Ownership

Community Land Purchase (CLP) and Community Land Trusts (CLTs) are associated with the purchase, or leasing, and management of land or assets by a community. The word community can be taken to refer to a group linked by place or by common aims or interests, or a common background. The land or assets purchased or leased by communities can include, village shops, pubs or greens, sports fields, sites for self-build housing, agricultural land or woodlands. CLP is undertaken for a wide range of purposes but, in general, it takes place where a community comes together to invest in a site for a common purpose. In many cases, CLPs have been undertaken in order to enable and empower communities in decision-making on development, natural resource use and ecosystem service provision. CLPs can also be driven specifically by nature conservation objectives. The purchase of woodland, or land to restore to woodland, has often been the focus of nature-based CLPs, however, it has also taken place to facilitate community supported agriculture, aiming to catalyse rural development (Mackenzie 2012¹⁸).

Community land ownership and land purchase are much less embedded in UK culture than in many other countries in Europe. In France, there are some 11,000 forest communes, while in Germany rural communities have owned forest for centuries. However, since the 1990s community ownership had become much more popular, particularly as a result of the land reform act in Scotland, the National Forest Land Scheme, the 2010 Localism Bill¹⁹, and initiatives such as the Community Woodland Association. Scotland pioneered community ownership in the 1990s on Assynt, Knotdart and Eigg, driven by issues with housing quality and land tenure. The Scottish Government has a target to achieve one million acres of land in community ownership by 2020, driven by a focus on democratising decision making on land and natural asset use at the local level. Community ownership is also thought to have the added benefit of promoting community cohesion and improving social capital through enhanced skills and experience. For community members involved it can also build community confidence and sense of worth. Notably, research has found that CLP can have the added benefits of catalysing other local economic and community activities (Mackenzie 2012).

UK community land trust and ownership organisations operate under a wide variety of tenure and ownership arrangements, finance structures and governance, from traditional models such as charities and trusts to more social and environmental investment businesses. A key aspect is to enable the group to have the ability to enter into legal contracts, to become an incorporated organisation. CLP groups operate under a diversity of objectives with varying degrees of participation by community members. Ensuring clarity of purpose is critical in forming CLP groups; technical challenges also include ensuring individuals are protected from liability. Historically, CLPs have largely been set up as charities or trusts, however, more recently research projects have looked at new ways for social enterprises to attract funding through equity or bonds where community investment makes a financial, social or environmental return on investments via interest or dividends. Community investment is generally defined as the sale of more than £10k in shares or bonds to communities of at least 20 people, i.e. they are financial ventures serving a community purpose. However, these sorts of finance investments need to generate a sufficiently attractive financial, social or environmental return on investment, e.g. community facilities, local carbon initiatives, woodland products can all help raise capital returns. The Phone Co-op is a classic example, it harnesses the combined financial powers of whole communities with a large amount of capital being raised in relatively small amounts from each member. In 2007 it had a membership of 6,700 who had collectively invested £1.6 million, with an average investment of £237 but a median investment of only £30.

Case studies

There are a wide range of CLP examples across the UK and internationally:

The Isle of Eigg Heritage Trust, Scotland	A CLP project to deliver landscape scale conservation through sustainable land management through community action for habitat management and recreation.
Community Commons, Herefordshire, England	A five-year project (2004-2009) led by the Herefordshire Wildlife Trust to improve the condition of twelve commons (1000ha) for wildlife and local people. Improvements were made through introducing more effective management regimes and using local people and community groups to secure long term sustainable management, recreational and education opportunities. Funded by a combination of Heritage Lottery Funds and Agri-Environment Schemes.
Heaton Woods Trust,	Heaton Woods Trust formed 30 years ago when residents bought land in danger of being

¹⁸ Mackenze, F.D., (2012) *Places of Possibility Property, Nature and Community Land Ownership*, Wiley Blackwell.

¹⁹ The Localism Bill generated opportunities for community right to buy.

Bradford, England	developed and planted it with trees. It was established as a Registered Charity in 1978 as an offshoot of Heaton Township Association. Its main aim is to preserve and replant Heaton Woods, the majority of which is now in the ownership of either Bradford Council or The Trust. The group is funded through sales of wood chippings and logs, grants and membership.
Whistlewood Common, Melbourne, Derbyshire	Community share offered to enable the purchase of 10 acres of a former market garden to create Whistlewood Common is now used for community food production.
Stroud Woods, Gloucestershire	Cooperative set up as an industrial and provident society with the aims to realise the environmental, biological, landscape, economic, social, cultural, educational and recreational value of woodland ecosystems in and around Stroud as a resource for a sustainable community.
Wiltshire Community Land Trust, Wiltshire	Wiltshire Community Land Trust offers advice on establishing local community land trusts, it is a volunteer led organisation that owns and manages assets for the benefits of a defined community.
Mull of Galloway Trust, Scotland	A community takeover developed as the best way to balance Mull's tourism potential with the need for environmental protection - and the Mull of Galloway Trust was set up to achieve it.
Loch Druidibeg, South Uist, Scotland	Purchase of 1100ha of land at Loch Druidibeg, South Uist, by a local group 'Stora Uibhist', working in partnership with RSPB Scotland after taking ownership of the land from Scottish Natural Heritage. The group aims to carry out habitat, goose and deer management, improve drainage and water quality.
The landcare community group, Australia	A network of local community groups working to protect natural resources and the environment. More than 4000 groups are working across Australia on sustainable management of farmland, improving river systems and waterways and coastal management, tree planting and restoring wildlife. Groups are formed by people with a common concern, through bottom up community actions as part of a wider network. Groups often work on public areas such as roadsides. Landcare group members provide the majority of funds.

Opportunities

Some 37% of Cornwall's population live and work in the coastal corridor, however many Cornish residents may not be able to individually own coastal land any larger than their back garden but could be interested in investing in shares of coastal land. For the One Coast project, developing a network of CLP groups along the coastal corridor could offer an additional route for land purchase for project partners, and provide committed and long-term volunteer groups to support the restoration and on-going management of natural capital assets. The project partners could take on a leadership role in the development of a Cornwall-wide network of CLP groups, working in partnership and providing expert knowledge and support where necessary for CLP groups. Initial set up work would be needed to catalyse and gauge the potential level of interest including an initial survey of existing community groups and residents. Awareness raising on the importance of the coastal corridor and the potential for CLP would be a critical first step. Once the network of CLP groups was established, possibly linked to different sections of the coastal corridor, the focus could then shift towards capacity building, particularly the provision of technical support and education on the development of CLPS, e.g. technical aspects of acquisition, liability etc, through clear and high-quality information and advice tailored to local needs. Notably, environmentally focused CLP have included North Harris and Knoydart, which have raised funds to employ rangers, engage in environmental education, and provide opportunities for locals and visitors to experience the local environment, and explore eco-tourism opportunities. An essential aspect allowing CLPs to take on/ mainstream environmental objectives is the perspective of the environment as a key part of the asset base for a region.

Issues

There are a number of issues facing CLP and management initiatives. Existing literature most often emphasises the economic barriers to CLP due to limited income streams, particularly in the face of government funding cuts. Lack of community cohesion can also be a key barrier. Communities engaging in, or those which have completed, buyouts are not necessarily cohesive and can face internal conflicts around buyouts, different values or objectives, and externally between community groups and environmental oriented partners. Other key issues include a lack of technical expertise and capacity. Furthermore, there are issues with trying to

push grass roots CLP from the top down, placing communities under pressure to take on assets that they may view as more of a liability. Reliance on community-based finance means that it may be vulnerable to future changes in the financial and economic landscape.

Resources

The Woodland Trust (2011) Community ownership for woodland management and creation – Community Woodland Ownership, Research Report, Available at: <https://www.woodlandtrust.org.uk/mediafile/100263178/rr-wt-71014-community-ownership-for-woodland-management-and-creation-.pdf?cb=f6144e3b40534c458e896052a12a9132>

MacLeod, C., (2017) The future of Community Land Ownership in Scotland, A Discussion Paper, Highlands and Islands Enterprise, Online report, Available At: <http://www.calummacleod.info/couchuploads/file/the-futureofcommunitylandownershipinscotlandadiscussionpaperfinal-2.pdf>.

Community Land Advice (2019) Community Land Advisory Service, Webpage, Available at: <https://en.communitylandadvice.org.uk/en/buying-land>

Forestry Commission (2013) A framework for sharing experiences of community woodland groups, Available at: https://www.forestresearch.gov.uk/documents/190/FCRN015_RZLgaTI.pdf

4.03 Green Prescriptions

Green prescriptions, also called nature-on referrals, are therapeutic or treatment-based interventions recommended by health practitioners aimed at realising the health benefits of being in an outdoor natural environment and widening the range of referral opportunities available to patients²⁰. Green prescriptions are a subset of a broader set of health and care activities including lifestyle advice and are generally used for long-term (chronic) conditions and mental health. A wide range of activities are included under the term 'green prescriptions', including care-farming, prescribed walking and wilderness therapy. Nature prescription groups refer specifically to treatment or therapeutic group sessions held in natural spaces such as parks, woods, gardens, beaches or upland areas. The use of green prescriptions is supported by a growing body of evidence of correlations between indices of health and wellbeing and exposure to nature (e.g. White et al 2019²¹; Bower et al 2010²²; Shanahan et al 2016²³; Barton and Pretty 2010²⁴; Alvarsson et al 2010²⁵; Repke et al 2018²⁶). Doctors are increasingly thought to be willing to prescribe time spent in nature for individuals with needs that could benefit from being in an outdoor environment.

In the UK, green prescription services (see Case Studies) have generally been funded by the relevant Clinical Commissioning Group, targeting patients with generalist needs or generalist and mental health needs. Prescriptions generally consist of a 12 week programme of weekly sessions. Activities are group based and can range from arts in nature sessions to outdoor activities and games, therapeutic horticulture, green or blue exercise, physical movement, learning about ecology and systems, group sharing and practical conservation tasks and eco-psychotherapy. As part of green prescription services, public parks, private green spaces can receive funding through the commissioning of health activities that will provide cost savings to the NHS or other public services through health benefits. Payments are made based on avoided health care cost calculations. However, questions remain over whether payments will be for activities (i.e. people taking part in prescribed activities) or outcomes (i.e. actual changes in health or wellbeing).

Implementing a green prescription service requires the development of a partnership and contractual agreement between service facilitators, land owners and managers, health professionals and patient-participants. In the UK, this has generally consisted of a partnership between primary care and the third sector. Contractual agreements to deliver green prescription services can operate at the city, regional or commission group scale (see Leeds, Rotherham, Dorset, Mersey Forest). Setting up green prescription services requires relatively long-lead times to ensure the service is known among local health care centres and that local health care professionals are willing to participate through referral. The patient (participant) can contact the group facilitator or vice versa. The identification of qualified facilitator or group leader and a willing land owner is a key prerequisite.

Case Studies

Branching Out	A 12 week nature prescription project in Scotland, operating as a partnership between NHS commissioners and the Forestry Commission.
Bromley by Bow Centre	Health centre in East London is pioneering the commissioning of social prescription services, including a number of garden, park and outdoor schemes.
Care Farm UK	Provides a voice and coordinating service for care farmers, who provide health and care services in farm settings.
Ways to Wellness	Social prescribing service in Newcastle that focuses on people affected by long-term health conditions. 3,500 patients per year will benefit from services that include outdoor-based approaches to tackling inactivity.
Dartmoor NPA Naturally Healthy Project	Rooted in community engagement and targeting inactivity, Dartmoor National Park Authority's project has been working with Dose of Nature on developing its overall approach.
Exmoor NPA Moor to Enjoy project	Exmoor's project aims to increase the confidence of visitors and residents, as well as deliver a nature prescription scheme alongside a local surgery to improve the wellbeing of patients suffering low mood.
Leeds West Patient Empowerment	Social prescribing service with a strong nature-based element. NHS West Leeds Clinical Commissioning Group has funded a partnership of voluntary organisations to deliver it in conjunction with 38 GP

²⁰ <https://www.adoseofnature.net/>

²¹ <https://www.nature.com/articles/s41598-019-44097-3>

²² <https://bmcpublihealth.biomedcentral.com/articles/10.1186/1471-2458-10-456>

²³ <https://www.nature.com/articles/srep28551>

²⁴ <https://pubs.acs.org/doi/abs/10.1021/es903183r>

²⁵ <https://www.mdpi.com/1660-4601/7/3/1036>

²⁶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6104990/>

Project	surgeries.
Mersey Forest Nature4Health Natural Choices Project, Dorset Rotherham Social Prescribing Service	Funded by Big Lottery money, a three year project to reduce health inequalities through the power of nature. A suite of activities based in nature that can be made available through referral or health check, or self-referral, in the Weymouth and Portland area. Delivered by a range of environmental partners. An established social prescribing project, funded by the local CCG and with a strong element of nature-based interventions for mental health. The evaluation report was influential in setting up the Dose of Nature scheme in Cornwall

Table 1. UK Green Prescription Schemes

Cornwall Case Study: A Dose of Nature

Cornwall's high-quality environment is ideal for green prescription schemes and there is a range already in operation across Cornwall (shown below). At present green prescription schemes across Cornwall²⁷ are relatively 'small, local and piecemeal projects, without any central referring system or any core funding' (Cornwall Council²⁸) and have yet to be mainstreamed. The Dose of Nature project worked to encourage the delivery of nature referral schemes in a coordinated way across Cornwall²⁹. The project resulted in 64 patient referrals, 48 patients waiting to complete a programme (as of 2017) with a reported increase of 69% of self-reported wellbeing, and two new self-organising support groups. *One of the main findings of A Dose of Nature has been that a referral to a group that regularly goes out into nature can benefit all sorts of people, with many health, wellbeing or social problems*" (Dan Bloomfield – Dose of Nature). In 2017 Cornwall Council consulted on a proposal to set up an LA wide nature-on-referral service in Cornwall³⁰ where patients will be encouraged to join groups that involve walking in natural places, and other nature-based activities to improve their health and wellbeing. The outcome from this consultation is unclear but the Dose of Nature programme remains active in Cornwall (see Dan Bloomfield³¹ for more details).

Location	Description
St Austell	Iterative, immersive activities in woodland settings, run by Nature Workshops, with patient-participants on referral from Wheal Northey Health Centre in St Austell.
Exeter	The Exeter Dose of Nature group is currently (as of July 2016) being run with partners from Ecotherapy Exeter, Devon Wildlife Trust, and participating GP surgeries.
Roseland	The first Roseland Dose of Nature project focused on walking in the peninsula and, delivered by Ecotherapy Kernow, ran in spring 2015. The project helped patient-participants with a range of health conditions. The second Roseland group, focusing on patients with mild to moderate depression, is currently (July 2016) ongoing.
St Ives and Hayle	Dose of Nature group met in woodlands in West Cornwall. Nature Workshop ran the group. Referrals were made from Stennack Surgery in St Ives and Bodriggy Surgery in Hayle.
Wadebridge	Ran for a total of 46 weeks, from September 2014 to October 2015. 25 different patient-participants benefited during the course of the project. It was run by the Gaia Trust, at their farm at Treraven on the outskirts of town. Restormel Mind was a key delivery partner.
Bristol	Delivered by Into the Woods, who run workshops for wellbeing in woodland environments. They worked closely with Forest of Avon Trust, Southmead Health Centre and Bristol Public Health team.

Table 2. Green Prescription Services in SW (Source: A Dose of Nature, Dan Bloomfield)

Opportunities

A key part of green prescribing is not only ensuring that health practitioners are on board but providing access to high quality green spaces and partnering with organisations that own and manage high quality natural capital. Both the National Trust and the RSPB own and manage high-quality natural environments, and are potential providers of nature-referral spaces by engaging with existing groups or promoting the setup of new groups on their estates. The sites where green prescription activities take place need to be managed wholly or in part for nature, contain sufficient flat and/or gradually inclining paths (a minimum guideline of 100m), have sufficiently accessible safe parking provision, and perhaps most importantly be located in an area readily accessible to one of the

²⁷ <https://www.cornwall.gov.uk/media/26898658/cornwall-nature-on-referral-plan-for-publication-2.pdf>

²⁸ <https://www.cornwall.gov.uk/media/26898658/cornwall-nature-on-referral-plan-for-publication-2.pdf>

²⁹ <https://www.adoseofnature.net/>

³⁰ <https://www.cornwall.gov.uk/media/26869866/cornwall-nature-on-referral-plan-summary-for-publication.pdf>

³¹ info@doseofnature.org.uk

target areas (*Dan Bloomfield*). In England, there is also evidence that the closer one lives to the coast the better one's health, and that this effect might be greater in deprived communities (Wheeler et al 2012). Setting up green prescription services on coastal areas could be a key opportunity for the National Trust and the RSPB to promote the One Coast project and potentially provide access to both volunteers and low-level funding for nature conservation on National Trust and RSPB owned sites.

Resources

Bloomfield, D., (2016) Dose of Nature: Addressing chronic health conditions by using the environment – A summary of relevant research, NERC, Online Report, Available at: https://nhsforest.org/sites/default/files/Dose_of_Nature_evidence_report_0.pdf; <http://www.doseofnature.org.uk/contact-us>

4.04 Results Based Agriculture Payments

Agri-environment schemes (AES) already provide an important source of funding for wildlife friendly farming. Results Based Agriculture Payment Schemes (or RBAPs), also referred to in the UK as Payment by Results (PBR), are a subset of AES which focus on payments to farmers to reward measurable improvements in farmland biodiversity. Under RBAP schemes, payments are linked to the delivery of outcomes rather than for specific capital investments or management actions. Biodiversity outcomes can be wide ranging and could include enabling or enhancing the presence of specific species. Under an RBAP scheme farmers generally have the flexibility to choose what management is required to achieve results for biodiversity, rather than following payments for prescribed actions. *“What defines a results-based scheme is that payments are made where a specific result is indeed achieved, making a direct link between the payment and the delivery of biodiversity or other environmental results on the ground”* (European Commission 2019³²).

Finance for RBAP schemes has come largely from public sources (e.g. EU CAP), national or regional funds but there have also been private and NGO led initiatives. In some cases, RBAPs have been implemented through collective approaches, focusing on specific areas or certain communities (e.g. Burren Farming for Conservation Project, Ireland) or via individual farmers and land managers (e.g. Les Prairies Fleuries, France). RBAP schemes can include ‘*pure*’ results-based schemes where farmers solely receive payments for outcomes, but more often there are ‘*hybrid*’ schemes where farmers are paid partly for the successful delivery of biodiversity results and partly for capital payments to cover the upfront costs of specific actions. For example, in the Burren Farming for Conservation Scheme in Ireland, a bonus payment is made by farmers based on the scoring of the biodiversity value of the field, and upfront capital grants are also available.

In the UK, RBAP schemes are currently being trialled by Natural England in four locations, Norfolk, Suffolk, North Yorkshire and East of England, through their Payments by Result initiative³³. Interest in implementing RBAP type schemes has been driven through efforts to prepare for exiting the EU and the development of a new Environmental Land Management Scheme (ELMS) to replace the EU Common Agricultural Policy (CAP). Under ELMS, farmers will be paid for delivering environmental services and benefits, such as improved air, water and soil quality, increased biodiversity, climate change mitigation, cultural benefits and better protection of historic environments. The aim of ELMS is to pay farmers for public goods rather than providing income support as the current, area-based scheme largely does. Environmental goods may include outcomes such as habitat protection and creation, natural flood management, water quality improvements, carbon capture, air quality, biodiversity recovery, and animal health and welfare. ELMS is planned as an alternative income stream, however it is not necessarily an RBAP scheme.

Case Studies

Burren Farming for Conservation Project, Ireland

The Burren Programme is an example of an established results based agriculture scheme operating in Ireland. The programme developed out of the Burren LIFE project first initiated in the 1990s to try to combat the loss of the unique species-rich limestone habitat. The Burren Programme is farmer-led, participating farmers co-fund action and adopt management practices and grazing regimes to conserve species-rich grasslands, improve livestock production, enhance nutrient management, remove scrub, and restore stone walls. The Burren Programme has pioneered a novel ‘*hybrid*’ approach to farming and conservation which sees farmers paid for both work undertaken (payment for actions) and, most importantly, for the delivery of defined environmental objectives. They are generally free to manage the land as they see fit (within the law). Payments for action are made through the creation of an annual farm plan containing a list of actions nominated by the farmer; jobs are individually costed and co-funded by farmers. Payments for results are made based on every eligible field of species-rich Burren grassland using a user-friendly habitat health checklist. Higher scores result in higher payments, giving farmers an incentive to manage their fields in ways that will improve their scores and their payment as well as the freedom to decide how to manage their land. Between 2010-2015, farmers in the Burren removed 214ha of encroaching scrub to protect the Burren’s orchid-rich grassland. The success of the Burren programme has led to its replication on the Aran islands, through the Aran LIFE project, which worked to improve the conservation status of 1,001 ha of species-rich grassland habitats in the Aran Islands through the implementation of optimal grazing regimes and payments for results. AranLIFE utilised €2.6 million of EU and state funding to develop the best possible farm management techniques to bring three key internationally important species-rich farmland habitats to favourable condition, i.e. calcareous dry grassland, limestone

³² European Commission http://ec.europa.eu/environment/nature/rbaps/index_en.htm

³³ Natural England RBAPs pilot <https://www.gov.uk/government/publications/results-based-agri-environment-payment-scheme-rbaps-pilot-study-in-england>

pavement and machair grassland. The Burren Programme has an annual budget of around €1 million funded by the Irish Department for Agriculture Food and the Marine and EU RDP funds.

Locally-led Agri-Environment Schemes and Results-Based Agri-environmental Payment Schemes (RBAPS), Ireland

The success of the Burren model in Ireland has led to this model being used to inform wider thinking on the management of farming for biodiversity across Ireland with a specific focus on locally-led or farmer led AES and the possible national development of Results Based Agricultural Payment Schemes. The Results-Based Agricultural Payment Schemes³⁴ (RBAPS) project has been funded since 2016, under the EU RDP, and aims to trial models to reward environmentally sensitive farming based on both the implementation of actions and evidence of positive biodiversity outcomes. Pilot schemes are in effect in Ireland for species-rich grassland in County Leitrim and for the Shannon Callows riparian meadows. At a smaller scale, the sustainable management of protected areas has been pursued through a variety of other European Innovation Projects, including the Nephin Bog SAC Upland Farming Group's Locally led AES, the Blackstairs Farming Future Partnership, and the Wicklow Uplands Council's Sustainable Uplands AES.

Natural England Payment by Results Trials, England

Natural England has implemented four Payments by Results (PBR) trials, providing funding, training and guidance for farmers at Wensleydale, Norfolk, Suffolk and East of England. The PBR pilot in Wensleydale is a partnership between the Yorkshire Dales National Park Authority and Natural England. Participating sheep and cattle farmers are rewarded for producing habitat suitable for breeding waders, or for managing species-rich meadows. Wensleydale has been chosen as a pilot as it contains a large proportion of the national upland hay meadow habitat and also breeding populations of four target bird species. Many farmers in this area are already undertaking management for these habitats under the Environmental Stewardship scheme, however, a high proportion of these schemes have already ended or are due to end. RBAP options include species-rich hay meadow or habitat for breeding waders. There is no set management prescription but a description of optimal habitats. A site area is assessed annually by the farmer and project staff, payments rates depend on the achieved score. In Norfolk and Suffolk³⁵, the pilot has focused on a predominantly arable area, a national hotspot for farmland birds. RBAP options include (1) winter bird food (for farmland birds and pollinators); and (2) pollen and nectar (for pollinators). The choice of options was based on the strong evidence that they are key to the survival of farmland birds and pollinators. Plots of winter bird food and/or pollen and nectar are assessed by the farmer and Natural England using a standard methodology. Assessments will also be completed on a number of 'control' farms elsewhere within the pilot area for comparison. Final payment rates for the RBAPS/PBR plots will depend on the results achieved, using a tiered approach based on how well the sown components have established and grown.

Les Prairies Fleuries, France

Since 2006, France has operated a Species Rich Grassland Programme, also referred to as the Flowering Meadows Scheme, a national competition rewarding France's best grassland meadows. As part of the competition fields are assessed using key indicator plant species, and rewards are given for farmers who manage to achieve the best agri-ecological balance on species-rich meadows and pastures on dairy farms. The contest was initially designed to test the implementation of a new style of agri-environment measure. The "Flowering Meadows" contract is results based as it allows farmers to manage their grasslands as they please as long as they achieve specific ecological outcomes. The results they seek are multiple, achieving a balance between productivity and biodiversity. The "*Concours Prairies Fleuries*" has become a national event and is now part of the prestigious *Concours Général Agricole*, putting biodiversity outcomes on a national pedestal.

Baden-Württemberg, Germany

A species-rich grassland scheme in Baden Württemberg³⁶, the MEKA programme has been operating from 2006. Conservation and enhancement of species-rich grassland in Brandenburg was trialled in 2008. The scheme offers a payment to farmers who manage species-rich grassland containing at least 4 key plant indicator species. The 4 species must appear within the regional catalogue of priority species. Around 4,800 farmers have engaged in the scheme covering approximately 44,000 ha of grassland, around 10 percent of all grassland in Baden-Württemberg. Farmers receive a payment of €60 per hectare for this species-rich grassland, however, it is recognised that this is a relatively small premium.

³⁴ <https://rbaps.eu/>

³⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/594104/grassland-factsheet.pdf

³⁶ http://ec.europa.eu/environment/nature/rbaps/fiche/meka-programme-b4-species-rich-grassland-grassland_en.htm

Opportunity

Finance for a One Coast specific RBAP scheme would either have to be sourced through national funding via Defra/Natural England ELMs trial or via combined National Trust/RSPB dedicated funding. Initial set up cost/ scheme design and research would require significant outlay, with participating farmer and staff costs dependent on the number of farmers and payment rates. The majority of RBAP schemes funded in Europe have been financed via the EU CAP Rural Development Funding, via specific national government funds or through EU LIFE nature funding schemes. The key advantage would be the ability specifically to engage and target the 300+ farmers with land intersecting or within the coastal corridor. Rather than aiming for large scale funding the best approach may be to fund a competition-style approach as undertaken in the Les Prairies Fleuries case study in France, for species-rich fields within the coastal corridor.

Issues and challenges

There are a number of challenges surrounding the introduction of RBAP, including relatively high transaction and administration costs, and issues with the scoring/assessment of biodiversity value. Initial scheme design and set up is likely to require a dedicated project officer, research for scoring scheme development and identification of potential participants. However, there is a growing body of emerging practice and research that can aid development. A key aspect of RBAP is ensuring that it is co-developed with farmers, which requires the development of a community of coastal farmers, and potentially significant engagement, training and workshops to ensure they are embedded and integral to the development of the scheme. Peer to Peer development is thought to be particularly crucial to uptake. Furthermore, advice from ecologists need to be integrated within the context of practical farming operations and to improve ecologists' understanding of the realities of farming. Any RBAP schemes need to have clarity over their objectives, whether this is species-rich grassland, or increasing resources or breeding grounds for coastal wildlife. Calculating fair payment levels is also crucial and needs to relate the amount of work expected and requirements.

4.05 Carbon Finance: Voluntary Carbon Offsets

Carbon finance covers a wide range of financial mechanisms linked to Green House Gas (GHG) emission reductions, from carbon taxes to emissions trading and voluntary carbon offsets. Carbon finance is a general term applied to investments in GHG emission reduction projects or the creation of financial instruments that are tradeable on the carbon market. Carbon trading is undertaken both in statutory 'compliance markets' and in largely unregulated 'voluntary markets' outside of statutory frameworks. Many carbon finance mechanisms require international and national government regulation and interventions beyond the scope of the One Coast Project, such as mandatory emissions trading schemes and carbon taxes, however, the voluntary carbon market offers the potential for much more small-scale investment opportunities.

Voluntary carbon markets provide carbon sequestration benefits to businesses, individuals and households acting of their own volition. As part of the voluntary market, consumers fund carbon reduction programs, independent and additional to those required under current national and international law, most frequently via voluntary carbon offsets. The total volume of carbon traded in voluntary carbon markets remains small compared to compliance markets. The lack of regulatory standards in voluntary carbon markets means they have also been subject to considerable critique.

Voluntary carbon offsets are projects that carry out on-the-ground emissions reduction activities, typically measured in metric tonnes of carbon dioxide equivalents, or tCO₂e. Carbon offsets are measurable, quantifiable and trackable units of GHG emission sequestration, designed to be used when reducing emissions becomes physically impossible or financially unfeasible. Offsets are purchased for a variety of reasons, most often as part of a corporation's broader environmental sustainability strategy or an individual's specific goal to reduce emissions (Ecosystem Marketplace 2017³⁷, 2018³⁸). Carbon offsets can take a variety of forms, from installing renewable energy infrastructures like wind turbines or solar panels to planting woodland that removes and stores carbon from the atmosphere (Table 3). Once established, and validated using a carbon standard, offsets can be listed and traded on voluntary markets (e.g. UK MARKIT³⁹), where buyers and sellers trade on their own volition. While an offset can only be issued and retired once, it may be transacted a number of times.

Although the purchase of carbon can provide additional finance for woodland creation and peatland restoration projects, voluntary carbon offsets have historically struggled with credibility concerns, particularly around quality, quantification of carbon reductions, and double counting. Considerable work to alleviate issues with the quality and accountability of carbon offsets has taken place since 2013, with the development of global (e.g. the voluntary carbon code) and domestic standards (UK woodland and peatland carbon codes). As a means of tackling climate change there are two chief criticisms levelled against personal offsets: (1) that they do not always deliver the carbon savings they promise, and (2) they encourage people to persist in unsustainably carbon-intensive behaviours and lifestyles. There has been a widely recognised decline in the demand for, and price of, voluntary carbon offsets, with less capital investment available for the development of voluntary offsets projects (Ecosystem Market Place, 2017, 2018). At present only high quality projects which offer considerable additional co-benefits, such as biodiversity conservation or water management are thought to be finding buyers. "End buyers are looking for "charismatic" offsets that emphasize co-benefits like economic growth or biodiversity preservation, and they are often willing to pay higher prices for them" (Ecosystem Market Place 2018).

Project Categories	Projects with Issued Offsets	Volume of Offsets Issued in MtCO ₂ e (2005 - Present) ⁴	New Projects ⁵
Agriculture – modifying agricultural practices to reduce emissions by switching to no-till farming, reducing chemical fertilizer use, etc.	87	6.7	1
Chemical Processes and Industrial Manufacturing – modifying industrial processes to emit fewer greenhouse gases.	72	63.5	0
Energy Efficiency and Fuel Switching – improving energy efficiency or switching to cleaner fuel sources.	633	127.9	8
Forestry and Land Use – managing forests, soil, grasslands, and other land types to avoid releasing carbon and/or increasing the amount of carbon the land absorbs.	170	95.3	3
Household Devices – distributing cleaner-burning stoves or water purification devices to reduce or eliminate the need to burn wood (or other inefficient types of energy).	161	23.4	0
Renewable Energy – installing solar, wind, and other forms of renewable energy production.	611	61.9	2
Transportation – increasing access to public and/or alternative transportation (like bicycling) and reducing emissions from private transportation like cars and trucks.	43	1.1	0
Waste Disposal – reducing methane emissions from landfills or wastewater, often by collecting converting it to usable fuel.	238	57.5	0

³⁷ Ecosystem Market Place (2017) State of the voluntary carbon markets 2017, Forest Trends. <https://www.forest-trends.org/publications/unlocking-potential/>

³⁸ Ecosystem Market Place (2018) Voluntary Carbon Markets Insights: 2013 Outlook and First Quarter trends, Forest Trends. <https://www.forest-trends.org/wp-content/uploads/2018/09/VCM-Q1-Report-Full-Version-2.pdf>

³⁹ MARKIT <https://mer.markit.com/br-reg/public/index.jsp?entity=project>

UK Voluntary Carbon Offset Market

In the UK the Voluntary Carbon Market is not particularly large and has seen a gradual decline since peaking in 2006-2008 (Ecosystem Market Place 2017). It has suffered from many of the same issues as the global markets, with issues around standards, quality and oversupply, which are now beginning to be alleviated through the development of the UK peatland and woodland carbon codes. The outlook for voluntary carbon markets remains uncertain and has faced declines with low pricing and a lack of demand over the last decade. However, annual market analysis (Ecosystem Market Place 2018) suggests that there are opportunities on the horizon for the voluntary carbon market. The Paris Climate Agreement could provide a pathway to encourage the establishment of a unit of emissions reduction, called the Internationally Transferable Mitigation Outcome, ITMO. Although the criteria for ITMOs are still under discussion they have the potential to include voluntary carbon offsets. The aviation and shipping industries are another key potential area of expansion of voluntary carbon offset demand. The aviation industry is not covered by the Paris Climate agreement, instead the International Civil Aviation Organization (ICAO) adopted the first sector-wide carbon offsetting scheme: CORSIA. If voluntary carbon offsets are included in CORSIA this could lead to a major increase in demand, but at present this is still an unknown and may not be resolved until 2021. Despite some positive indications at present the voluntary carbon market remains relatively uncertain, potentially a high-risk for new project investment, with low levels of investment.

A range of corporates, companies and governments voluntarily offset their emissions. Historically in the UK, voluntary offsets have generally been largely purchased by customer or citizen facing corporates with an interest in cultivating an image of Corporate Social Responsibility and environmental concern. This is also the case globally, where *“the bulk of voluntary offset purchases by volume are made by multi-national, private, for-profit companies”* (Ecosystem Market Place 2018). For example, a major company may choose to offset a portion of their emissions as part of its sustainability strategy. Voluntary offset purchasers in the UK have included UK FAST IT company, Barclays, Microsoft and Kier Living. Once offsets have been purchased return buyers tend to purchase higher volumes (Ecosystem Market Place 2018). Small and Medium Sized enterprises can also be involved in offset purchases, for example, small festival and glamping companies can be interested in offsets. Although an individual traveller might offset their air travel emission, the individual offset purchase market has historically been very small scale. There have however been some high-profile individual offsets purchases for example in 2018/2017 the rock band Pearl Jam offset the emissions associated with their tour in Brazil (Ecosystem Market Place 2018).

Woodland Carbon Offsets

Woodland creation as a Voluntary Carbon Offset

Woodland creation offers a cost-effective and tangible way of creating a voluntary carbon offset, by sequestering some of the CO₂ that has been released into the atmosphere. Woodland creation already benefits from a range of grant programmes in the UK, designed to minimise the outlays by land owners and managers. Currently, active grants/finance mechanisms include The Countryside Stewardship Woodland Creation Grant; Countryside Stewardship Woodland Creation Planning Grant; Forestry Commission: Woodland Carbon Fund, Woodland Trust: Moor Wood; Network Rails: Biodiversity Fund and the National Forestry Creating Woodlands Funds. Additional finance for woodland creation projects can be generated through selling carbon sequestration as voluntary carbon offset sites via the UK Carbon registry MARKIT⁴⁰.

Forestry Commission Woodland Carbon Fund

The Forestry Commission⁴¹ provides financial support for landowners and managers for the planting of large-scale productive woodland as a means of carbon sequestration through the Woodland Carbon Fund (WCF). The standard WCF payment covers 80% of the cost of planting trees and capital establishment items such as protection items (e.g. tree guards, fencing and gates), the installation of forest roads and recreational infrastructure. Payment levels are capped at £6800 per ha, however 'priority places' (applies to proposals near to urban areas, which give access to the public on foot) receive 100% of the standard costs for planting and establishment capital items, capped at £8,500 per hectare. WCF agreements generally last for around 5 years but can be extended for 10 years. After successful establishment, an additional one-off capital payment of £1,000 per ha can be made after year 5. Landowners and managers in receipt of the WCF are still eligible to receive agricultural subsidies such as BPS. Eligibility for

⁴⁰ MARKIT <https://mer.markit.com/br-reg/public/index.jsp?entity=project>

⁴¹ Woodland Carbon Fund: <https://www.gov.uk/guidance/woodland-carbon-fund>

WCF is dependent on size thresholds, with 10 ha or more to be planted as woodland, either as one continuous block of 10 ha of new planting in stands no more than 50m apart. The objective of the new planting must clearly remain to establish productive woodland. For any given block of woodland, integral open space is no more than 20 meters wide, no more than 0.5 hectares in extent, and completely surrounded by woodland or forest. WCF funded woodlands must include productive tree species on 70% of the net planted area, at a density of 2,000 stems per hectare minimum. It is possible to generate additional finance from selling carbon credits via registering with the Woodland Carbon Code within 2 years from the start of planting. Validation/verification of this standard provides assurance of the carbon savings and access to the voluntary carbon market.

UK Woodland Carbon Code

The UK Woodland Carbon Code⁴² is a voluntary government-backed carbon standard for woodland creation projects. Woodland Carbon Units from verified WCC projects can help a company compensate for their unavoidable emissions. The code aims to ensure that woodland creation provides meaningful and measurable carbon sequestration in a transparent and clear way for potential investors, using established methods of estimating carbon capture. The Woodland Carbon Code is designed to provide assurance for potential investors by providing a measure of the quality of woodland creation, guidance for establishment and management, a standardised way of estimating and predicting carbon uptake, and guards against double counting (and selling) of carbon benefits. After new woodlands are created, they have two years to register with the Woodland Carbon Code, the process requires validation to estimate tonnes of carbon the woodland will sequester over a set period of time. Once validated, the number of tonnes of carbon predicted to be sequestered through the woodland creation projects can be marketed on the UK registry (Markit), enabling a business to buy carbon to offset their emissions and providing additional income from woodland creation. The UK Woodland Carbon Registry holds details of WCC projects and tracks the issuance, ownership and use of carbon credits, which can be used to look up a project or to see who has purchased carbon units from WCC projects. To meet the requirements of the WCC a project needs to be (1) registered with the Forestry Commission, specifying their exact location project site; (2) meet UK standards for sustainable forest management; (3) have a long term objective and management plan; and (4) use approved methods for estimating carbon capture, to demonstrate that the project delivers additional carbon benefits. By the end of 2016, 243 projects had registered with the Woodland Carbon Code. Projects meeting the Woodland Carbon Code help to meet emission targets under the UK Climate Change Act.

Case Studies: Woodland Carbon Code

Allstar Business Solutions:	Allstar , the UK's largest fuel card distributor, has bought carbon from 44 Woodland Carbon Code projects across the UK to help their customers compensate for their vehicle emissions as part of their Ecopoint scheme, launched in January 2015. The Ecopoint programme is designed to enable Allstar's wide customer base to easily measure the carbon footprint of their card holders, and turn the aggregated carbon into UK woodlands through a coordinated mitigation programme. Allstar decided on a programme of UK woodland creation and management on behalf of Ecopoint subscribers because of the multiple and local benefits UK woodlands offer in addition to carbon capture.
Bilfinger GVA	Bilfinger GVA , the UK's leading real estate advisory business, has been buying carbon from a project in Cumbria since 2015 to compensate over time for its office energy usage as part of its daily business operations. The company buys carbon equivalent to 2,000 tonnes of CO ₂ every year that it cannot reduce from its office energy use. From 2016 Bilfinger GVA will be increasing the scope of its mitigation project to include emissions from business car mileage.
UK Green Investment Bank	The UK Green Investment Bank Plc has bought carbon units from three projects around its headquarters in Edinburgh, working with Forest Carbon. This project is managed by Tweed Forum, a charity leading integrated land and water management in the Tweed catchment.
Premier Paper Group	Premier Paper , the UK's leading independent paper merchant, since 2011 offers customers the chance to compensate over time for the production and distribution emissions of the paper they buy, with carbon from projects in Cumbria and Hertfordshire.
Waitrose	Waitrose , working in partnership with the Woodland Trust since March 2011, bought carbon from the Warcop site, to help compensate for the tailpipe emissions of their home delivery fleet. Waitrose was one of the first companies to sign up to Woodland Carbon, the Woodland Trust's carbon removal scheme. Every customer who shops online helps to plant trees to compensate for tailpipe emissions. Warcop is a Ministry of Defence site used as a military training ground for soldiers and set in an Area of Outstanding Natural Beauty in Cumbria. The trees planted by Waitrose will

⁴² Woodland Carbon Code <https://www.gov.uk/guidance/the-woodland-carbon-code-scheme-for-buyers-and-landowners>

remove over 22,300 tonnes of CO₂ over the project lifetime and will create approximately 50 hectares of woodland providing homes for biodiversity. Added benefits include raising Waitrose environment and CSR credentials, developing a strong marketing message and staff engagement.

Table 4. Woodland Carbon Code Case Studies (Source: Forest Carbon)

Opportunities

Opportunities for carbon capture and storage by vegetation are present throughout the coastal corridor. Current levels of carbon storage and sequestration are highest in woodlands areas, although this is based on limited data and could underrepresent the storage potential in coastal margin habitats. The most well developed carbon offset format which fits with the aspiration of the One Coast project to create a nature rich and accessible coastal corridor is through woodland creation, however, in the future, this may be extended to saltmarsh, wetlands, and other coastal margin habitats. The policy context in Cornwall is currently very supportive of the creation of woodlands and carbon sequestration, with the recent declaration by Cornwall Council of a Climate Emergency⁴³, the current development of Cornwall Council Tree Canopy Charter⁴⁴, and initiatives to develop a 'Forest for Cornwall'. Cornwall Council is actively looking for actions to take in response to the recent Climate Emergency and Voluntary Carbon Offsets could be one part of the solution. However, with the benefits of carbon finance there are also responsibilities, namely to ensure the woodland project is properly managed, delivers the carbon sequestration promised and provides a transparent account of progress. There may be specific local difficulties with woodland creation in Cornwall's climate. New woodland creation opportunities maps created by the Mainstreaming Environmental Growth Project should be used to identify target sites with multiple co-benefits (Mosedale et al. 2019 in prep).

Key to the development of potential woodland carbon offset sites will be the utilisation of multiple grant sources alongside additional carbon income, and engagement with existing established actors in this sector such as the Woodland Trust who are already active in Cornwall with sites close to the coastal corridor. Additional partnerships could be developed with Forest Carbon to engage with the identification and selection of voluntary carbon offsets within or close to the coastal corridor. Woodland creation is a long-term investment and could benefit from the creation of a specific woodland fund to facilitate project development by land owners in the coastal corridor, with a blend of philanthropic funding and repayable finance to help investment in woodland projects prior to revenue generation. Although the current market is small, income for the sale of woodland carbon could help encourage existing landowners to plant additional woodland, provide new sources of income, and make woodland more attractive than traditional farming. Additional potential sources of income and examples include the Gresham House Forestry Investment, Community forestry investment via the National Forestry Company and Inheritance tax planning products. Notably, there is interest at present only in 'high quality' offset projects which offer considerable additional co-benefits, such as biodiversity conservation, and both project partners are well placed to deliver high quality 'charismatic' offsets with multiplied benefits. Outside of woodlands, there is also notable potential to pioneer coastal wetland carbon offsets⁴⁵.

⁴³ Cornwall Council (2019) Climate Emergency: <https://www.cornwall.gov.uk/environment-and-planning/climate-emergency/>

⁴⁴ Cornwall Tree Canopy Charter: <https://www.cornwall-aonb.gov.uk/cornwall-tree-canopy>

⁴⁵ [http://bluecarbonportal.org/blog/wetlands/revised-guide-to-supporting-coastal-wetland-programs-and-projects-using-climate-finance-and-other-financial-mechanisms/...](http://bluecarbonportal.org/blog/wetlands/revised-guide-to-supporting-coastal-wetland-programs-and-projects-using-climate-finance-and-other-financial-mechanisms/)

4.06 Payments for Ecosystem Services

Payment for ecosystem services (PES) refers to instances where the maintenance or improvement of a natural capital asset delivers an associated flow of ecological services in exchange for economic recompense (Mayrand and Paquin 2004⁴⁶; Wertz 2006⁴⁷). PES schemes can be more generally thought of as a “*generic name for a variety of arrangements through which the beneficiaries of ecosystem services pay the providers of those services*” (Gutman, 2006⁴⁸). The defining factor of what constitutes a PES transaction is that they deliver or maintain a flow of specified ecosystem goods or services, such as shoreline protection, water quality improvements or carbon sequestration capabilities, and that the provision of these services merits some kind of commission or economic recompense (Jack et al 2007⁴⁹). Payments made are based on carrying out clear interventions, such as woodland or wetland creation, peatland or river restoration, with established and evidenced links to the provision of target ecosystem goods or services. Within a rural economy perspective, PES systems are a means of rewarding those who maintain, create or improve the natural systems and habitats. The most important rationale behind PES schemes is that it can help jointly achieve conservation and livelihood objectives. PES transactions are generally voluntary and can be developed wherever a well-defined ecosystem service is available to be bought by at least one buyer, or beneficiary, from at least one provider, land owner or manager (Wunder 2005⁵⁰). PES schemes rely on economic incentives to induce land management change, and can thus be considered part of the broader class of incentive or market-based mechanisms for environmental policy. The success of PES is largely contingent on their capacity to engage previously uninvolved actors (beneficiaries of ecosystem services) into conservation activities.

Globally, PES schemes have been developed for a range of ecosystem goods and services, from the provision of sustainable fuel wood, improvement of fish nurseries, water quality improvement and pollution regulation, carbon sequestration, shoreline stabilisation, hazard protection, nutrient regulation, soil formation, recreation and aesthetics. Some financial mechanisms already outlined in this report could also be classed as PES schemes, such as Results Based Agriculture Payments, Social Prescribing, and Visitor Giving schemes, the purpose of this section is to provide a more in-depth understanding of a range of private sector or market-based PES schemes. PES schemes have been developed and piloted since the 2000s across the UK. Looking at existing UK PES pilots, water-based PES schemes have shown the most potential, also referred to as catchment-based programmes (e.g. Upstream thinking, Fowey, SCAmp, Peak District). Water-based PES schemes have been developed where water companies or municipal governments have invested in natural capital restoration upstream to achieve financial savings through downstream improvements in water quality or water quantity. However, as highlighted previously the PES model does potentially have much broader application.

The development of a PES scheme requires establishing a clear demand for the ecosystem good or service and willing sellers or providers. Sellers can include landowners, NGOs, community groups, agri-business, large estates, pension funds, shoreline owners, LA and utilities. While demand is often driven by a buyer experiencing problems with the supply of a particular ecosystem service, most often in the UK this has been water utility companies (see Table 5). PES schemes can also arise through opportunities to increase ecosystem service provision, such as carbon sequestration. Alternatively, PES can be developed where a beneficiary has an existing dependency on ecosystem services which are under threat (e.g. water supply). Some businesses can also have a commercial stake in a local provenance which can also aid the establishment of a PES scheme.

Whilst ecosystem services are relatively well understood, linking ecosystem services benefits with the identification of a beneficiary or payee can be challenging, time consuming and requires in-depth knowledge of not only the natural capital assessment and conservation actions which can improve the supply of ecosystem services but also potential beneficiaries through understanding local stakeholders and enterprises and their supply chains. The identification of saleable ecosystem services requires consideration of: (1) Are there specific land or resource management actions that have the potential to secure an increase in the supply of the service? (2) Is there a clear demand for the service in question and is its provision financially valuable to one or more potential buyers? (beneficiary analysis). For PES schemes to operate effectively, benefits have to be additional or act in situations where ecosystem services benefits are at risk. PES schemes are also conditional on carrying out specific evidence-based actions linked to the delivery of measurable ecosystem services provision (e.g. additional tonnes of carbon sequestered), and suppliers need to remain accountable to independent verifiers to ensure a service is delivered. Provision must also be financially viable for potential buyers. In most cases, the beneficiaries and providers of ecosystem services are found in the same area. Watersheds have generally been the unit for the development of PES, but habitat or place based frameworks are also possible alternative units.

⁴⁶ Mayrand, K., and Paquin, M., (2004) *Payments for Environmental Services: A Survey and Assessment of Current Schemes*. PES Unisfera.pdf

⁴⁷ Wertz, S., (2006) *Payments for environmental services – A solution for biodiversity conservation?* IDDRI wertz_pes.pdf

⁴⁸ Gutman, P. (2006): “PES – A WWF perspective”, Presentation, WWF (www.panda.org/about_wwf/what_we_do/policy/macro_economics/our_solutions/pes/index.cfm, July 2006).

⁴⁹ https://sites.tufts.edu/kjack/files/2011/08/Jack_Designing-PES-PNAS.pdf

⁵⁰ Wunder, S., (2005) *Payments for environmental services: some nuts and bolts*. CIFOR. Wunder_2005.pdf

Case Studies

A range of PES type schemes and projects are currently in action across the UK:

NAME	TYPE	DESCRIPTION	SUPPLIERS	BENEFICIARIES	MECHANISM
Upstream Thinking, Fowey River Improvement Auction, Cornwall	WATER QUALITY	The River Fowey is a source of drinking water in Cornwall but suffers from sediment and pesticide pollution from agricultural practices. South West Water incurs costs treating water to make it safe to drink. The Fowey River pilot project ⁵¹ focused on the delivery of water quality-based ecosystem services using a reverse auction mechanism to distribute funds from South West Water to farmers for investing in capital items to improve water quality. Funds were used for on farm management actions that could reduce pollution levels through reduced inputs of pesticides, fertilisers and particulates to reduce downstream water treatment costs. South West Water made £360,000 available to farmers for capital investment in farm infrastructure to improve water quality. With help from advisors from the Westcountry Rivers Trust, farmers entered sealed bids to South West Water. Value for money was combined with an environmental improvement score, with 18 successful bids. The auction approach proved fast to implement with the scheme devised and implemented in 6 months and had the benefit of being farmer led. The project also faced a number of challenges, particularly around building awareness of the concept of ecosystem services. There was a particular lack of appreciation of the provisioning and regulating services which natural capital assets can provide. The project provided South West Water with considerable cost savings compared to engineering solutions. The project also revealed that paying farmers who are not demonstrating basic stewardship of the land is difficult to accept.	Farmers	South West Water Fowey Harbour Authority	Reverse Auction
Tortworth Brook Project, South Gloucestershire	WATER QUALITY	The Tortworth Brook Project is an example of the development of an integrated constructed wetland to reduce water pollution using a PES contract between Wessex Water and Torworth Estate to address issues with phosphorous discharge (Greaves et al 2014 ⁵² ; Everard 2013 ⁵³ ; Defra and Wessex Water 2014 ⁵⁴). The ecosystem service, in this case, was the purification of treated sewage effluent to remove nutrients, particularly phosphorus and nitrogen, entering the Tortworth Brook. To date, typical water company solutions to reducing phosphorous concentration in effluent discharge have been to install stripping mechanisms, by chemical dosing, typically with iron chloride or sulphate. For water companies stripping phosphorous is an expensive, energy, transport and resource-intensive process that increases solid waste output from the sewage treatment process. The work was jointly funded by Defra and Wessex Water and conducted in partnership with Bristol Avon Rivers Trust (BART). This used an integrated constructed wetland (ICW) solution to treat wastewater and reduced water treatment costs for Wessex Water. Interest in a PES type scheme was driven by both regulatory and financial drivers alongside environmental aspirations. The Tortworth Estate received payment from Wessex Water for the provision of land for the development of an ICW, construction of the ICW, and for the subsequent management and maintenance, such that Wessex Water's discharge consent would continue to be met. Wessex Water continues to provide regular payments to the Tortworth Estate to cover land rental, agricultural production foregone and for the continued management of the ICW. Such payments could also help facilitate the future development of additional ICWs within the catchment, which would help realise the Seller's broader ambitions of a catchment-wide wetland-based approach to ecological and water management.	Tortworth Estate	Wessex Water	Single transfer of funds, with ongoing maintenance payment for income forgone
Poole Harbour PES scheme [RSPB]; Poole Harbour Nitrogen Offsetting Project	WATER QUALITY	PES schemes linked to Poole Harbour have focused on the reduction of nitrate pollution and improved water quality, which is currently preventing development around Poole Harbour, Frome and Piddle, and affecting water quality for Wessex Water. Various PES schemes have been explored around Poole Harbour since 2012, developed by Dorset County Council, RSPB, Dorset Coastal Forum and Wessex Water. The original Defra PES Pilot in the area focused on nitrogen trading led by the RSPB and Dorset County Council and aimed to tackle the issue that new developments at Poole must be "nitrogen neutral" under the Habitats Regulations to be permitted. The Poole study found that nitrogen mitigation through reducing agricultural pollution in the catchment could cost £4.6m less over 50 years than nitrogen stripping alternatives. The legal imperative to reduce nitrate pollution based on impacts on Poole Harbour SPA creates potential buyers and potential for a nitrogen trading market. The nitrogen trading scheme aimed to enable new developments to take place as long as they pay others to reduce	Farmers	Developers and Wessex Water	Uniform Price Scheme

⁵¹ https://socialsciences.exeter.ac.uk/codebox/get_image.php?id=129

⁵² [http://www.relu.ac.uk/landbridge/7%20M%20EVERARD%20Tortworth%20PES%20\(2014-02-10%20COMPRESSED\).pdf](http://www.relu.ac.uk/landbridge/7%20M%20EVERARD%20Tortworth%20PES%20(2014-02-10%20COMPRESSED).pdf)

⁵³ https://ecosystemsknowledge.net/sites/default/files/wp-content/uploads/2013/12/EKN_Lowland_BART.pdf

⁵⁴ http://randd.defra.gov.uk/Document.aspx?Document=13819_PESFinalreport.pdf

		<p>the amount of nitrogen entering the harbour from existing sources, balancing the input from new development. The key beneficiaries are developers, who benefit from construction, but there are additional beneficiaries include the local authority and recreational users of the harbour. A proposed full nitrogen-mitigation PES scheme in the Poole Harbour catchment was not developed (Defra 2016⁵⁵), local authorities and local developers are instead looking to land use and management changes to offset new nitrogen discharges (RSPB 2013). Given that farming is the principal cause of nitrate pollution, there were notably local authority objections to paying farmers for a reduction in agricultural nitrogen pollution which was seen as undermining the polluter pays principle. (RSPB 2013). Farmers and landowners also proved unwilling to accept long-term contracts for PES measures. However, PES-like agreements are beginning to appear in the catchment, for example the Borough of Poole Council have converted farmland to parkland at Upton Country Park to mitigate nitrogen discharges from new development, with developers purchasing 'mitigation credits' through the Community Infrastructure Levy, to date this has seen £102,000 of credits purchased (RSPB 2013). Since initial investigations in 2013, Wessex Water has piloted a separate nitrogen offsetting scheme with land managers to reduce excessive nitrate entering Poole Harbour and offset nitrate contained in the effluent discharged from Dorchester's water recycling centre. Wessex Water has paid farmers to grow cover crops that brought about reductions in the level of nitrates. A uniform price scheme by environment trading platform EnTrade. A new tool called Fundsreader ensures that farmers in the catchment who have agreed to carry out environmentally friendly farming measures are all paid the same (£/kg N) for doing so and the reward they receive is based on the amount (kg N) that they save. EnTrade developed Fundsreader with the help of Exeter University and trialled it in February 2019 after listening to feedback from the Poole Harbour farmers, who have worked closely with EnTrade since it launched out of Wessex Water in 2015.</p>			
Lysekil Nutrient Trading Scheme, Norway	WATER QUALITY	<p>A trial scheme whereby payments were made to mussel farmers to encourage the cultivation of Blue Mussels which filter excess nutrients and reduce eutrophication, thereby improving water quality. A lack of demand for the mussels meant that revenue could not be guaranteed and the trial scheme was unsuccessful. The expected beneficiaries were the Lysekil communities, sellers include the mussel farmers, run by an intermediaries 'community board'.</p>	Mussel Farmers	Lysekil communities	Financial transfer
Hull Flood Risk	WATER QUANTITY	<p>The Hull flood risk project is working to address flooding issues by using urban habitats to avoid the cost of upgrading sewer capacity and reduce flood risk. The main beneficiaries include Hull City Council (on behalf of individual households) and Yorkshire Water. The project focuses on the creation of large-scale SUDS and greenspace, as well as street level SUDS. The Council is funding the project by blending finance from multiple sources. However, this layering finance has proved complex.</p>	Multiple	Yorkshire Water, Local Residents, Hull City Council	Financial transfer
River Fal, West Cornwall	WATER QUALITY	<p>The Westcountry Rivers Trust works to secure the preservation, protection, development and improvement of the rivers, streams, watercourses and water impoundments in the region. Among its projects is Wetland Example of Payments for Ecosystem Services (WEPES), which is restoring a section of a historic floodplain on the River Fal in West Cornwall. This includes an economic evaluation of the direct and indirect ecosystem services benefits, as well as identifying and selling the most economically beneficial services to local investors.</p>	Farmers and land owners	Residents, Cornwall Council	Financial Transfer
River Devon Catchment	WATER QUANTITY	<p>In 2004, HSBC funded, via World Wildlife Fund-UK, sustainable flood management measures such as tree planting, erosion control and wetland restoration in the River Devon catchment in south-west England. This was a three-year project and actions were undertaken voluntarily by employees of HSBC.</p>	Landowners and Farmers	Residents, Devon County Council	
Angling Passport, South West England	RECREATION	<p>Landowners improve fishing beats through capital investment in infrastructure such as fencing and coppicing. Access to fishing beats is sold to anglers as tokens via the Westcountry Rivers Trust. Anglers deposit the tokens at fishing beats used; landowners then redeem the value of the tokens from the Trust. Beneficiaries are anglers, sellers include farmers and landowners, and the scheme is managed by the West Country Rivers Trust. Works aim to boost fish stocks. Schemes run by South West Water and Wessex Water pay landowners to change their land management practices to deliver water quality and</p>	FARMERS and landowners	Anglers and South West Water	Recreational licence fees

⁵⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/578005/pes-pilot-review-key-findings-2016.pdf

		quantity benefits" (Reed, 2013).			
Energy for Nature Scheme [RSPB], Somerset Levels	BIODIVERSITY CONSERVATION	The RSPB has developed an innovative "Energy for Nature" scheme in the Somerset Levels based on converting surplus biomass from wetland conservation into marketable bio-energy products on a landscape scale. Turning biomass from habitat management into energy. Energy for Nature was one of several projects funded through the third round of Defra's Payments for Ecosystem Services (PES) Pilot Scheme. The project worked to research and develop a PES based model that creates a "sustainable funding stream to support essential conservation work whilst providing a reliable, and ecologically sustainable, source of energy to local communities" (RSPB 2016 ⁵⁶). The project took place in a wetland landscape area of the Somerset Levels and Moors and utilised the vegetation generated as a by-product of carrying out habitat management for conservation and turning it into saleable bioenergy products, such as briquettes for woodburners, loose material for biomass boilers, or electricity. The Energy for Nature scheme showed how wetland creation can be investable in the long run, providing a reliable return on investment, and offset their management costs, particularly if converting the material into electricity through anaerobic digestion (RSPB 2016). The work in Somerset suggests that cost to the RSPB c. £70,000/year could, through the adoption of this concept, generate an income of £150,000/year if markets were developed for wholesale loose biomass, or over £5 million/year if converted into and marketed as a specialist product such as biochar and sold retail (RSPB 2016). The Energy for Nature project has potential to be immediately transferable to other wetlands managed by RSPB and could also be adapted for use on heathland, while the biomass calculator could support other landowners to pursue similar projects (Defra 2015 ⁵⁷).	RSPB	RSPB / Nature Conservation	Sustainable production and enterprise
Smithills Natural Enterprise Catalyst, Bolton	BIODIVERSITY CONSERVATION	This pilot project explored the potential for payments for PES on Woodland Trust owned Smithills estate, a 1500 acre upland fringe site near Bolton. The aim was to explore the development of new enterprises that can be used to sustain natural capital on the site, specifically focusing on income for payments for ecosystem services that the site's natural capital provides and using social and private micro-enterprises. Smithills is predominantly farmed rather than woodland, and the aim was to use the site to demonstrate the role that trees and woodland can play in providing a range of services to both people and business. The Trust also aimed to show how trees can be beneficial within the farmed environment, for example through the provision of shade and shelter to livestock. The pilot focused on services currently unsupported by functional markets but have the potential to be independent of grants or philanthropy. Two enterprises were developed during the piloting period (1) a charcoal fired social enterprise-owned food truck – designed to promote and bring locals up to the site, and (2) a 'woodshare' enterprise – aimed at involving locals in sustainable firewood production. Post pilot the Smithills estate is still being progressed, with support of future heritage lottery funding and the planned development of a community interest company to develop additional social enterprises. The model developed by the Smithills estate has the potential to be rolled out in other peri-urban sites. Notably, one finding from this pilot was the "PES enterprises that are based on a suite of specific local demands for products and services may gain more traction and interest than transactions for services with more generalized social benefits – such as carbon, or biodiversity" (the Woodland Trust, 2015 ⁵⁸).	Woodland Trust	Biodiversity Conservation /Local Residents	Sustainable production and enterprise
South Pennines (Crichton Carbon Centre)	CARBON [MULTIPLE]	Development of carbon valuation methodology for a 'place-based' PES scheme with a focus on climate regulation and benefits to water quality, biodiversity and recreation. The project was led by the Crichton Carbon Centre in collaboration with IUCN Peatland Programme, URS, Defra and Natural England provided funding support. The study focused on how to develop place-based approaches for PES. It considered how marketing carbon could be combined with other possible marketable services, and development of metrics to underpin a voluntary peatland carbon code. Focused on a place-based PES scheme to deliver improvements in multiple ecosystem services in the same location through a voluntary transaction where a known quantity of ecosystem services is purchased by one or more buyers, leading to an overall increase in the provision of the service that would not have otherwise occurred. A place-based PES scheme may take place when a "premium" is charged for a core ecosystem service (such as climate mitigation or water quality) being "bundled" with a range of additional ecosystem	Landowners or Farmers	MULTIPLE LOCAL ACTORS [e.g water companies and visitors]	[STUDY ONLY]

⁵⁶ <https://www.rspb.org.uk/our-work/conservation/projects/energy-futures-project>

⁵⁷ <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18907&FromSearch=Y&Publisher=1&SearchText=payments%20for%20ecosystem%20services&GridPage=1&SortString=ProjectCode&SortOrder=Asc&Paging=10>

⁵⁸ <http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=18907&FromSearch=Y&Publisher=1&SearchText=payments%20for%20ecosystem%20services&GridPage=1&SortString=ProjectCode&SortOrder=Asc&Paging=10>

		services that are provided by the same management intervention. The ecosystem services considered most 'marketable' and therefore most able to generate private revenue to support their enhancement, were water quality, climate regulation, biodiversity, flood risk regulation and recreation.			
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Table 5. Payments for Ecosystem Services Case Studies (Source: Defra)