CPES Geographic Scope Report (T1.2.1)

Westcountry Rivers Trust (WRT) Case Study Areas

Roadford lake/reservoir ©Broadwoodwidger.com

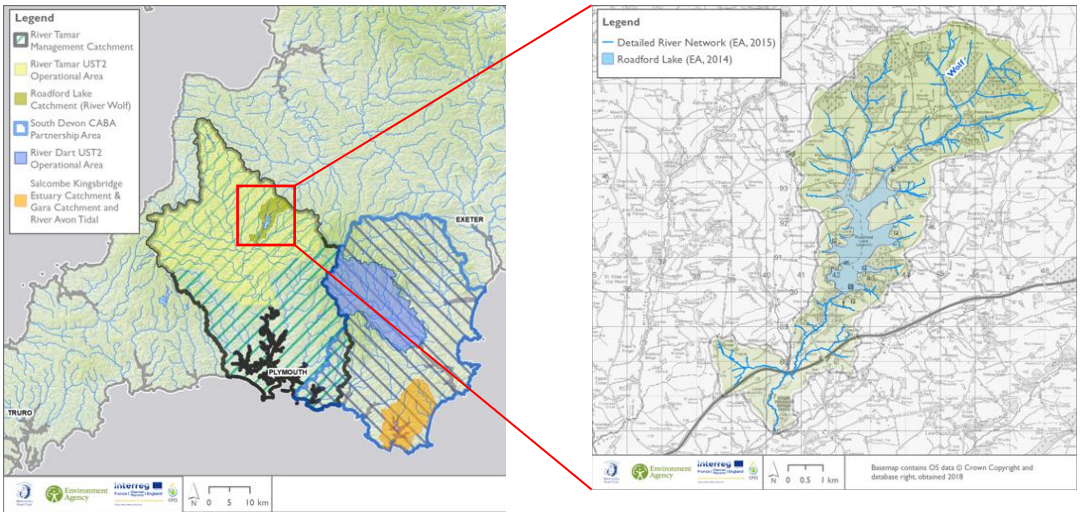
Contents

Introduction

This Geographic scope report aims to outline the key areas and stakeholder interests under the CPES project for the two pilot case studies. Fundamentally, it aims to outline current activity and interests in those areas in respect to environmental conditions and more specifically water quality – from residents or social demographics to business and industry. As the project looks to develop the potential for new and sustainable PES schemes, the report considers organisations, groups or companies who have interests in the immediate catchment – these may be direct or indirect. From understanding collective interests and how they rely on certain functions (Ecosystem Services) from the landscape natural assets, together with the State of the Environment reports these present the building blocks to begin formulating an approach which could see alternative markets for investment. Where multiple interests and opportunities align, clearly these should be prioritised for further investigation. This is a dynamic report and therefore designed to be updated throughout the duration of the project to reflect more detailed understanding at a local scale and hence progress.

A) Roadford Lake, Devon

Location of case study area



Roadford lake, is a drinking water reservoir situated just inside the Devon border in the South West of the UK. It is one of three strategic supply reservoirs for the local Water Company (South West Water (SWW)) and was completed in 1990 following two separate drought years (1976 and 1984) as part of a programme to increase capacity. 1976 is still very much used as the lowest benchmark point of reference in the region and saw residents relying on standpipes due to lack of supply. This lake of 3 km² is the largest volume of freshwater in the southwest at 37,000ML[1] when full and provides drinking water directly to north Devon and from its release into the Tamar for abstraction further downstream; contributes to supplies for the city of Plymouth (with a population of ~270,000) and into south Devon.

The lake was built to impound the River Wolf, which forms part of the River Lyd system; located in the north east of the larger River Tamar catchment including areas of Cornwall and Devon and virtually stretching between both the north to south coasts. The Tamar landscape incorporates a wide range of habitats, whereas the main Lyd on the edge of Dartmoor and the Wolf adjacent primarily consist of grassland with steep wooded valleys. The entire Wolf catchment area is 39.3 km².

Stakeholder analysis; who's who?

The Wolf catchment is predominantly rural with only a couple of sizeable villages (Germansweek; 67 households, the smaller Broadwoodwidger lies downstream of the lake and Lifton beyond that as the largest village at over 500 properties[2]) with several small hamlets dotted throughout. Residential properties are dispersed across the catchment and these are mainly older properties with minimal recent housing development and little Industrial footprint other than Agriculture. Using Germansweek as a representative example – the social demographics of this area reveal that housing is mainly detached or semi-detached, very low levels of unemployed with a third of those in work being self-employed and a significant level of economically inactive (retired) at 42%[2]. A small number of original properties were lost to the construction and footprint of the reservoir itself. Furthermore, records indicate that levels of social deprivation here are low with over 80% either not deprived or level one only. However, as a small and desirable rural village in a predominantly agricultural region, the village of Germansweek may reflect rural retired rather than the wider rural population on average.

The catchment is mainly laid to Agriculture or woodland/forestry, run by small to medium sized family farms. The area includes some older established Estate ownership with resident tenant farmers. As evidenced in the State of the Environment report; land-use in catchment indicates 76% grassland, 12% woodland and a total of 7% either temporary grass or crops – which dictates the productive capacity of the land here with a strong leaning to livestock and some dairy production. Historically farming may have been more small mixed family farms and post-war seeing some level of relative intensification with culm or rough grazing converted to improved grassland or forestry in places. Immediately adjacent to the lake, there are less than 10 individual landowners in this discrete area[1].

As an overview of other key interests and those active in this catchment for land and water interests:

South West Water (SWW) *Private Sector* - the most extensive interest in terms of area, the Water Company own the reservoir and associated infrastructure including a hydropower plant at Roadford. This Water Company provide drinking water and sewerage services to the vast majority of the southwest population, which also experiences a high level of seasonal fluctuation due to Tourism. They operate and must meet standards and objectives within the Water Industry eg. the Water Services Regulation Authority (OFWAT) and the The Drinking Water Inspectorate (DWI).

South West Lakes Trust (SWLT) *Charitable Trust* – manage sites for and with SWW under a management agreement; this includes land in the immediate boundary of Roadford with a range of natural habitats, watersports facilities and angling activities on the lake, recreational access and amenity for the public including footpaths, camping, cycle trails and a busy café & events centre. The site has a new management plan currently being drafted to achieve a range of objectives and works with a number of Partners in delivery, and a Biodiversity Action Plan (BAP) to address the complexity of habitats or schemes on site. Visitor numbers have grown in recent years as the site has seen investment and improvements, the most recent figures available indicate an estimated 202,000 visitors to the lake car park in 2007[1].

Westcountry Rivers Trust (WRT) *Charitable Trust* – are an environmental charity whose remit is to help restore and protect the water environment in the Westcountry for the benefit of people, wildlife and the local economy. Education is also key at all levels to advance the understanding of community groups and the public about water and the importance of a healthy, functioning environment. WRT have been active on the Tamar and Lyd systems as 'home' rivers since they were established as one of the first Rivers Trusts in 1994 through a number of projects and hence have an established relationship with many landowners and contacts locally from farmers, anglers, communities, Government bodies and Private companies. WRT also host the Tamar Catchment Based Approach (CaBA) with representatives from all sectors.

Devon Wildlife Trust (DWT) *Charitable Trust* – the county wildlife body for Devon, DWT run habitat and species focused projects and at Roadford there has been activity undertaken to support the status of sites in particular areas of Culm Grassland in the catchment which have declined regionally, plus through working with landowners on uptake of Environmental Stewardship schemes and a trial Beaver enclosure site in catchment which is part of a research project. DWT and WRT jointly deliver the Upstream Thinking project for SWW on the Tamar and Lyd catchments, working with farmers to identify opportunities for improvement for water quality protection.

Forest & Land Management *Private sector* – manage the woodland and forestry areas directly under control by SWLT and SWW in their land surrounding the lake. These areas include some ancient semi-natural and replanted woodland, including areas which constitute a Local Nature Reserve

(LNR). Much of the older woodland is dominated by Oak which provides rich and diverse trophic ecosystem layers – these also feature in the BAP and management plan for the site.

Forestry Commission (FC) *Public sector* – responsible for protecting, expanding and promoting the sustainable management of woodlands and increasing their value to society and the environment. Part of the lake perimeter is forested and saw 'Roadford Forest' planted in the year 2000 comprising ~80ha of mixed conifer. The FC were involved in the establishment and since then direction has changed slightly to recognize greater value towards underlying Culm grassland or other species rich areas, hence work will aim to remove such areas over time and via a Forest Management Plan including actions via an English Woodland Grant Scheme. SWLT also has a 'Celebration Woodland' as an extension to the Roadford Forest where the public are invited to donate to further woodland planting. Upper areas of the Wolf also include forestry parcels which represent a significant land area, where operations and extractions here could impact water quality

Environment Agency (EA) & Natural England (NE) *Public sector* – Both part of the Defra family (Department of the Environment Food & Rural Affairs). The EA is a Regulator for environmental matters which includes a responsibility for the protection and enhancement of the environment in England. Its staff work with other active parties locally and will act on pollution incidents, flood protection and certain licensing eg. Fisheries. Officers may undertake monitoring as part of their evidence base and contribute to ongoing policy such as River Basin Management Plans together with stakeholders through initiatives such as CaBA. The EA also publish guidance for Agricultural best practice such as the recent Farming Rules for Water 2018 which are mandatory steps to protect natural assets.

Natural England (NE) is responsible for ensuring that England's natural environment, including its land, flora and fauna, freshwater and marine environments, geology and soils, are protected and improved. It also has a responsibility to help people enjoy, understand and access the natural environment. Catchment Sensitive Farming is a scheme managed by NE which provides advice and offers grant support to farmers in priority areas, the Lyd has not been a priority although parts of the Tamar have in recent years. NE has also previously been the delivery body for Environmental Stewardship schemes ELS, HLS etc for which there is significant coverage in the Wolf, and currently Countryside Stewardship.

Tamar & Tributaries Fisheries Association (TTFA) *Community group* - The TTFA represents all the major fishery interests on the river who work together and with key Partners to protect and sustain habitats and populations for the future. On the Lyd system this has meant working to understand and compensate for the fact that there are man-made features and a dam installed in the river network which effects migration, riverbed substrate condition, flow regimes etc. WRT, SWW and the TTFA in particular have worked closely on this for a number of years.

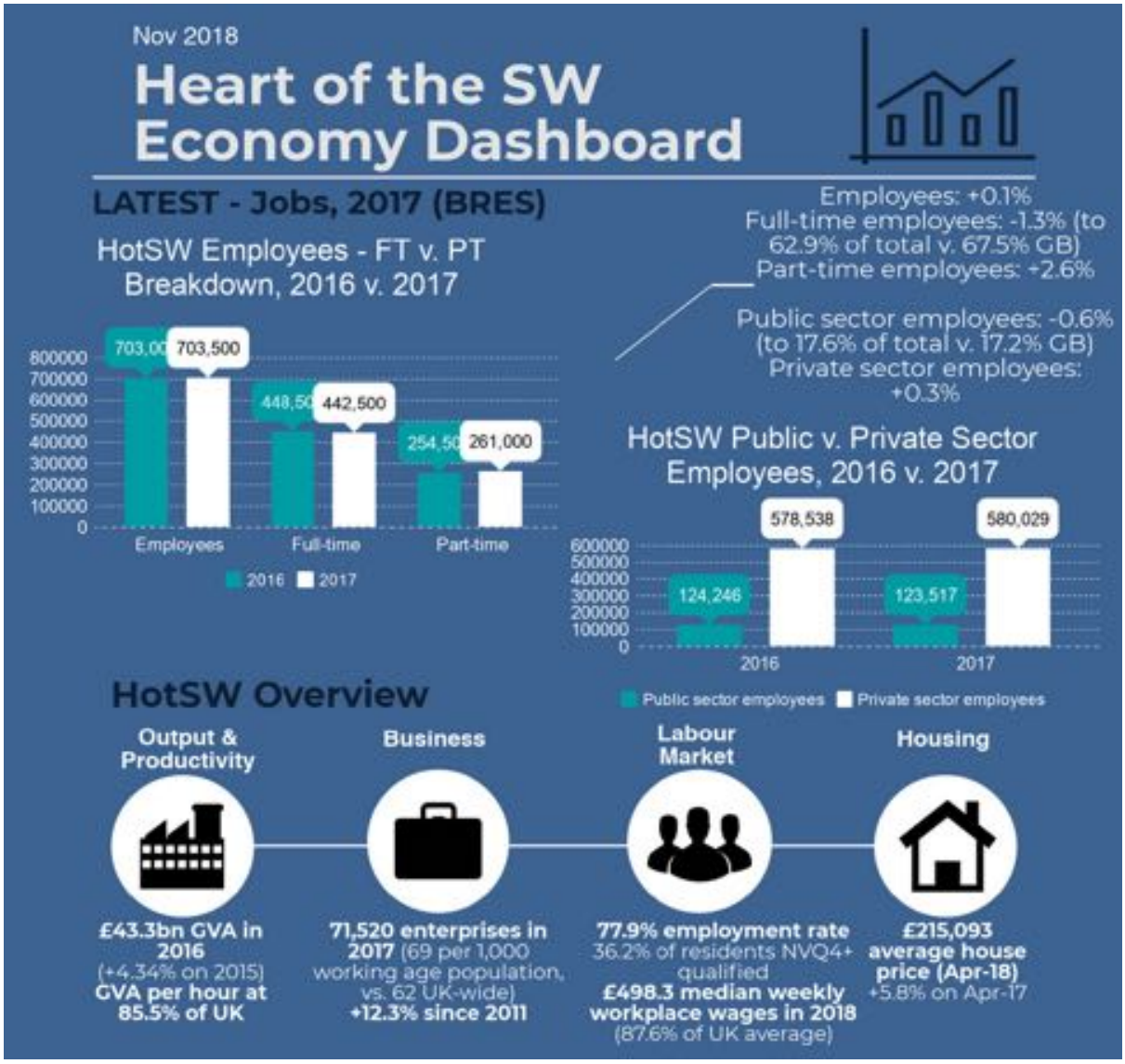
Business *Private sector* – A wide range of Companies of all sizes have an interest in the catchment; the most obvious being those related to Agriculture – from local contractors & suppliers, to those further up the supply chain being manufacturers, processors or end retailers. Given the primary production in catchment, the receivers will include meat, dairy and potential cereals.

Farmers groups or representatives - Although not all farmers may belong as full membership to a group, there are organisations which work for, with and represent the farming community such as NFU, CLA with regional leads eg. Devon & Cornwall area.

Tourism & Recreation *Private sector* – The southwest broadly has high dependency on tourism and Roadford Lake itself is the main attraction in catchment, as run SWLT for its access and amenity for

both green and blue space. Besides this, there are a number of smaller accommodation or activity providers based or operating here for visitors or domestic uptake. These often link into schemes or umbrella bodies such as Devon Tourism, Green Tourism Award Schemes etc with associated organized promotional activity.

Local Authorities / Councils *Public sector* – The Wolf catchment sits within Devon County Council, which is further divided between both West Devon and Torridge District Council, and locally a handful of Parish Councils. **The Local Enterprise Partnership** (The Heart of the South West) is a business-led partnership between the private sector, local authorities and social enterprise which aims to help support and develop the local economy through advice, business support and securing project funding. Through its work it has access to data to underpin the social economics of Devon more broadly to shape future needs, this confirms that for example employment levels are high (77.9%), there are nearly 5 times as many private sector employees as public sector, and by far the largest enterprise model is micro at 89.1%[4], which underpins this rural county.



Heart of the South West (Devon) economic dashboard

Stakeholder perceptions

SWW and SWLT are at the focal and receiving point from most of the other interested parties; SWW must answer to their paying customers – the public – in response to concerns over water quality and these may also be raised on site due to the visual impact of degraded water quality. Roadford has signs in the carpark to warn the public about the presence of algae in the lake and to ensure people do not enter the water due to risk of potential toxicity. SWLT advise that the reports of algae have increased over the years and clearly this is of concern to the public for their own safety, but they may not directly associate the lake with their drinking water.

SWW are currently evaluating and planning an approach for Roadford due to declining water quality, which has made this a priority for their next investment round from 2020, due to the Drinking Water Safeguard Zone. They are willing to consider alternative approaches combined with previous activity working with landowners under the Upstream Thinking project, which WRT has been jointly delivering. SWW identify that Nitrate (N) & Phosphate (P) levels are leading to increased scale and frequency of blue-green algae, release of Geosmin and MIB (produced by algae, but also from soils or terrestrial organisms). Plans are currently being devised to operate a new approach from 2020 via further catchment management.

Presence of algae at Roadford lake has raised concern amongst visitors

Residents in the area who visit the site regularly for recreational purposes may fall into this same category of concern. Feedback from SWLT reports that algae levels have impacted on watersports activity eg. A planned Triathalon which requires a safe swimming environment, angler's equipment becoming entangled in thick algal blooms etc. Algae also accumulates on the lakeshore and during 2018 with an extended dry period there have been thick mats of algae which impact aesthetically in terms of recreational values on site. Evidence is anecdotal rather than empirical, but staff suggest increases over a period of nearly 20 years.

Farmers may only be aware of the water quality in the network of feeder streams where they have more direct access and influence, rather than the lake itself as a receiving body. There have been water-focused project delivery in the area over recent years but these schemes are mainly voluntary, alternative approaches may be required to highlight impacts and encourage greater uptake – which will need to illustrate greater or wider benefits potentially to achieve this.

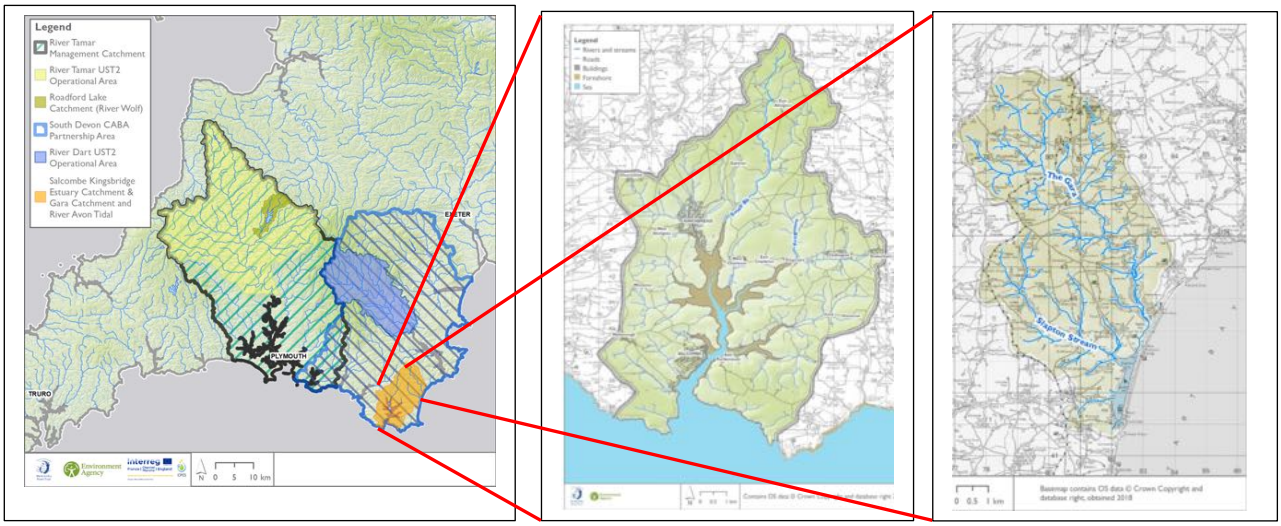
Anglers have found the experience in certain areas of the lake difficult re; access and in practical terms for handling or recovering kit, hence actually catching fish is difficult due to the volume of

algae based also on anecdotal feedback. Conditions may also impact on fish populations due to oxygen depletion, as well as other aquatic biodiversity.

From a Corporate view, the SME's may have some involvement with the farmer/producers due to the nature of their work but less likely to be aware of local water quality issues, nor have the finance to get involved in anything other than 'business as normal'. There is, however, a growing interest from Companies to review their supply chains, partly for resilience in the face of climate change partly in response to public (customer) pressure due to social attitudes towards reducing high levels of food waste, reducing carbon footprint or food miles. The Companies are often distanced from their initial producers, as well as provenance in the context of environmental conditions – therefore awareness of water quality is typically low. There are some initiatives emerging to address these of which the Courtauld Partnership is one, which is taking a landscape or catchment-scale approach to key areas and working in collaboration to identify risks to operations and supports actions to mitigate these.

B) Kingsbridge Salcombe Estuary, Slapton & Gara, Devon

Location of case study area



The Kingsbridge Salcombe Estuary sits on the south coast of Devon, within the South Devon Area of Outstanding Natural Beauty (SDAONB) and is formed of a cluster of relatively small river catchments including Small Brook, the Avon and Frogmore Stream covering 88.4 km² draining into the main estuary, formed from a drowned river valley. It has no single large river flowing into it which could provide consistent flow and dilution, which contributes to issues of water quality as a result. The area is renowned for its rolling hills, coastal views and sheltered natural harbour which has supported a strong tourism legacy in this area and particularly recreational boating.

Land is productive (some Grade 2), able to support more intensive dairy and arable production which are visible as a backdrop to the coastal fringe. There is no drinking water abstraction in catchment; supply here originates from the adjoining Dart catchment flowing off the high ground of Dartmoor; water quality issues are most pressing on the receiving body where enrichment has led to algae blooms impacting protected areas including the Estuary SSSI and Shellfish waters, bathing & coastal waters.

To the immediate east of Kingsbridge – Salcombe are the smaller catchments of Slapton stream and river Gara, which cover a combined area of 46.4 km² and both drain into a freshwater ley (lake) which was formed by a shingle bar between the coastal waters and what was previously an estuary in the post-glacial era. Land cover and use is very similar to its neighbour in Kingsbridge Salcombe, with productive farmland and some very steep-sided wooded valleys. The Ley holds a number of designations and is highly valued for its biodiversity, with recreation and tourism here also representing a strong sector both for the coast and inland.

Stakeholder analysis; who's who?

Collectively the South Devon coastal area encompassing Kingsbridge Salcombe, Slapton and Gara catchments is very rural, with larger communities centred mainly on the waters edge which have developed over generations linked to trade or industry. The two significant towns are Salcombe (population 1,691 est. 2017[5]) and Kingsbridge (population 17,835 in 2016) with numerous small villages and hamlets throughout the area. However, with the growth in Tourism this region has seen a significant rise not just in visitors and hence seasonal pressures on resources, but also in the proportion of holiday or second homes. As with other areas of the south west, this impacts the social demographics of the 'local' population and has resulted in a relatively high proportion of retirement age residents eg. Salcombe 38% at 65 years+, and disproportionate pockets of wealth. Comparatively the Salcombe and Slapton areas are classed as some of the least deprived in Devon[2].

This also impacts on the economy via extreme housing values, limited stock in a rural setting and less opportunity for younger generations to remain living and working here, as many jobs tend to be linked to low level, seasonal roles. Outside of Tourism, agriculture remains a key industry with numerous small to medium sized operations and family enterprises – often diversifying into tourism to contribute to their business income. As with Roadford, the inland catchment area revolves around agriculture but historically there was also a larger marine element for boatbuilding, commercial shipping or fishing but this has become much more recreational of late as illustrated below.

As an overview of other key interests and those active in this catchment for land and water interests:

South Devon AONB *Public sector* – have a key interest covering 60 miles of the south Devon coastline and hinterland. It has its own partnerships of organisations which aim to represent local interests and its communities, these work together with the Partnership Committee to organise and lead activity identified and agreed in its Management Plan. Broadly it aims to protect and manage this landscape and works with its Partnership for advice and guidance on this, including Planning.

Environment Agency (EA) & Natural England (NE) inc. Catchment Sensitive Farming (CSF) *Public sector* – In addition to role and interests at Roadford, which form their fundamental role as Government bodies – locally there is also a presence from CSF. This NE voluntary scheme works with farmers on water quality related actions to improve WFD status; this operates in key 'priority' areas. Part of the South Devon focus area is considered 'High priority' under NE/CSF which enables farmers to access advice and potentially grant funding for capital works, as well as support towards Countryside Stewardship options. In part this priority aligns with the new NVZ here.

Westcountry Rivers Trust *Charitable Trust* – Local activity by The Trust has included farm and fisheries improvements via the South Hams River Improvement Project (SHrIMP), a focus on Frogmore due to failing WFD status and significant fisheries work in and around Slapton, partly with the Field Studies Council (FSC). More recently through working with the EA and the South Devon Catchment Partnership (which it co-hosts with the AONB), a detailed scoping exercise was carried out to support and inform a Diffuse Water Pollution Plan for the SSSI.

Slapton Field Studies Council (FSC) *Charitable body* – Part of a national network of educational charities, Slapton FSC sits immediately overlooking the Ley and runs courses, co-ordinates volunteers and undertakes environmental activities to support the public engagement with its natural environment and to progress learning. The Ley is also a National Nature Reserve and SSSI which present opportunities for direct actions as well as suffers from being the receiving body from all upstream inputs of the Gara and Slapton streams.

South West Water (SWW) *Private Sector* – much lower level of interest here due to no direct abstraction in catchment area. They do still have infrastructure in the form of sewage works, pipelines etc which requires maintenance and may be scrutinized by the public due to discharges to surface or coastal waters from failing systems or consented discharges.

Centre for Environment, Fisheries & Aquaculture (CEFAS) *Public sector* - provides scientific support and research for the marine and freshwater environment to ensure marine environments remain healthy and also assists with ensuring seafood is safe and sustainable ie. checking water bacterial loading or food safety standards, helping to ensure sustainable future fisheries. **Aquaculture** (*private sector*) - Mussels and non-native Pacific oysters are farmed in Frogmore creek and coastal shellfish contribute to the local economy, within and outside of the estuary mouth.

Salcombe Harbour Authority (*Public sector*) – a member of the British Ports Association, Salcombe is operated as an authority and mainly revolves around recreational and leisure use, some commercial fishing or shell-fishing, and seasonal ferry transport to Dartmouth and Kingsbridge. Work includes management and maintenance of infrastructure such as quays, slipways, moorings and pontoons.

Boating Industry and Services *(Private sector)* – the area supports many small businesses which cater for yachting or boating; building, repairs, moorings, chandlery, hire, sports etc. Twelve are listed in Kingsbridge or Salcombe alone, with a further eight operators offering various watersports tuition or hire[6]. The coastline also includes the Southwest Coast Path which is a strong attraction in itself and encourages the public to get up close to nature and investigate this green & blue space.

Visit South Devon CIC – *Charitable body* – several other Tourism Associations locally have developed as a result of growth in this sector, including Visit Devon, Hello Kingsbridge, Experience Salcombe and SouthHams.com – all of which operate to offer accommodation, promote activity and services locally.

Food & Drink Companies (*Private Sector*) – this productive area sees local support for farm shops, and niche products – in turn supplying the many hotels, restaurants, cafes and outlets in the region. Seafood, ice cream, soft fruit & vegetables, gin distillery and local brewery are all catered for here which compete for local Award contests (Taste of the West) as well as more mainstream food production of meat, milk and cereals the majority of which would go into larger supply chains.

Slapton ley ©Southhams.com

Stakeholder perceptions

In addition to the Agricultural Industry here, the strong Tourism sector relies heavily on the natural environment, although the two are closely linked with many farmers having diversified to some extent such as holiday accommodation, farm gate food sales or added value products etc. Clearly this is core to its attraction and operations, as such any impacts to the environment will also impact the economy and lost business may be more than one year of spend but future years. Farmers have raised concerns and contested the recent NVZ, questioning actual water quality standards. Furthermore they also point out the growth in development and failure of infrastructure to adequately cope with this, South West Water do not have any abstraction in catchment but they are undertaking a review of infrastructure as they evaluate investment for the next 5 years.

Marine activities in and around the harbour and estuary may also see a decline in support if water quality degrades. The SSSI designations here and NNR at Slapton dictate a need for careful management but the wider catchment may be contributing unknowingly. Marine and coastal initiatives have recently seen wider recognition of plastic pollution but perhaps not so much actual water quality. Bathing waters may highlight occurrences of pollution from land-based discharges, sewer overflows in rainfall events but less so the lower diffuse losses from agriculture or domestic sources. The AONB has a strong element of engagement with coastal interests and links with Estuary groups and Harbour Associations, but actions to limit decline may be difficult for them to enact if they do not have the connections to other sectors or projects/funds to deliver change at an appropriate scale.

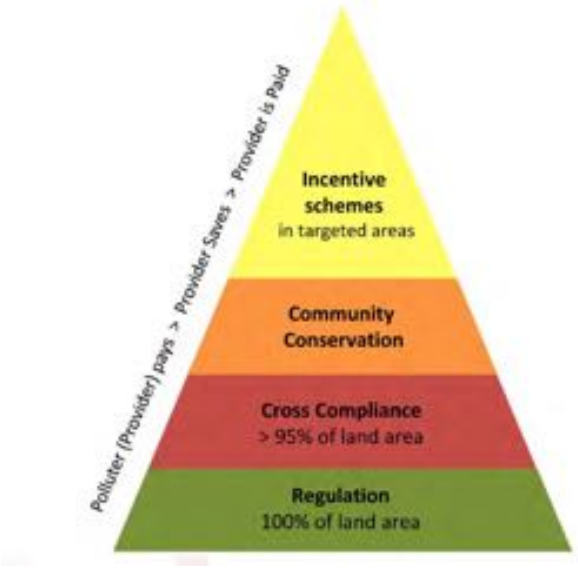
The natural environment is a key asset here and its enhancement and protection maybe key to developing a different approach. Having a long list of interested and enthusiastic outdoor groups may assist in dissemination of ideas to grow local support, the FSC is well placed geographically and through its network of volunteers and fundamental remit for environmental education to assist on the ground. They experience degraded water quality and impacted habitats first hand, with access to empirical results over a suitable time frame and the ability to work in partnership to take this forward. As a trusted local entity, their role could be very valuable to enable a PES scheme to take shape and reach key members of the community.

Overarching existing regulatory & economic frameworks

In the context of agricultural operations farmers have a series of rules, **regulations** and obligations which they must abide with; these include minimum standards eg. for animal or plant health, environmental or welfare conditions. The majority are embedded into **Cross Compliance** which support delivery of the Common Agricultural Policy (CAP) via payments to farmers in the form of Basic Payment Scheme (BPS) or Stewardship Schemes such as CS, ELS, or HLS. Minimum standards are dictated under SMRs (Statutory Management Requirements) and that the land is managed in Good Agricultural and Environmental Conditions (GAECs); operations and schemes must adhere to relevant rules. A percentage of farms are inspected each year to check compliance by the Rural Payments Agency (RPA), failure to meet these may result in reduced or lost payment. Examples are GAEC 1; establishing buffer strips adjacent to watercourses, GAEC 4 providing minimum soil cover.

Strategic areas may also have additional protection applied such as a Nitrate Vulnerable Zone (NVZ) status, these areas have increased restrictions on operations which need to be met due to the risk of

contamination to water supplies. Schemes are regularly evolving, in 2018 a new set of Farming Rules for Water came into practice which are very similar to GAECs and require minimum practice by all farmers – to be enforced by the Environment Agency.



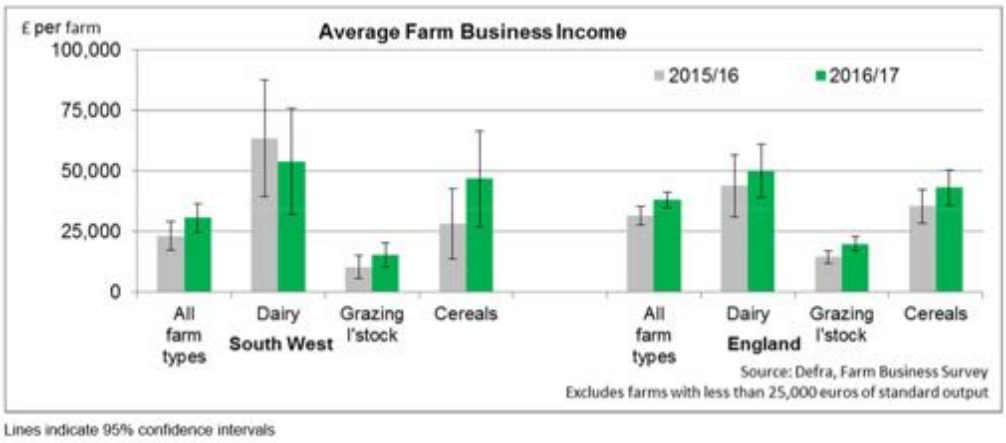
Community Conservation offers 'win-win' best practice advice; pointing out where ecosystem services may be increased whilst also bringing about economic benefit for the farmer too. This can come about in a number of initiatives and levels. Agri Environment Schemes are available to support and promote best practice, with an aim to also reflect the provision and delivery of so called 'public goods' ie. A clean and sustainable drinking water supply being one. Nationally schemes maybe offered via Natural England (NE), most recently in the guise of Countryside Stewardship (CS) or Catchment Sensitive Farming (CSF) providing capital and revenue payments. On a local scale there are regional schemes which deliver similar ambitions, tailored to local conditions – in the southwest Upstream Thinking is a PES funded by South West Water, delivered by a Partnership of charitable bodies including the Westcountry Rivers Trust. These are **Incentive Schemes** where Non-Governmental Organisations may have an advantage by being free of regulatory powers and potentially accepted more readily by farmers as a result, where uptake of advice or confidential guidance is perceived as more supportive, friendly and less dictatorial. Advice is factual and evidence based, hence able to quantify and qualify change, making economic and environmental sense for the farming business bottom line (more win-wins).

There can be limitations to farmer uptake on certain actions, where the **payback period** to realise benefits is too long for them to see this as a priority – a grant scheme here will help to bring that investment forward as a result. Eg. Significant yard infrastructure or woodland planting. Without financial incentives, although the farmer may understand the potential benefits, it is often difficult to raise or release the funds due to ongoing work pressures and farm economics. Funding support here will secure those benefits much quicker as a result both for the farmer (seller) and a potential buyer.

The final part of this framework is the ability to make radical changes and either take land completely out of production, or subsidise activity (ie. **income forgone**) through a one-off or series of payments to revert/change/cease activity to one of lower 'risk', which clearly depends on the interests of the potential buyer. Long term land change is difficult to negotiate in part due to the high values often associated with land and relative scarcity; farmers want to farm and not be purely land owners, but payments may be attractive to those who are asset rich but cash poor, willing to implement change on a relatively small proportion of their land.

Finally, communities and society are tending to develop a stronger sense of interest and opinion regarding their food supply, sourcing, traceability and provenance. This is not purely seeking out organic produce or the growth of local farm shops, there is a much stronger movement which has a growing number of the population questioning production, shifting dietary choices and hence buying trends which in turn the food Industry is responding to demonstrate transparent and sustainable

ethics throughout their business. This could be viewed as both positive and negative depending on position; it could strengthen markets which are able to meet and appeal to the consumer, but ostracise and ultimately make business unviable to those who do not. Companies are therefore beginning to respond by looking internally to scrutinize their operations and their supply chains: How sustainable are they? What are their welfare conditions? Do they leave a low or zero Carbon footprint? How robust are they when considering the influence of Climate Change and do their operations contribute to Green House Gas (GHG) emissions?



Defra Statistics for South West Farm Business Incomes (2016)

A number of options are available to farmers and landowners when considering their operations and how these may impact the environment, from broad nationally competitive schemes to more focused, local initiatives which could be tailored to one key output. As the UK considers its future association with Europe and changes to the Common Agricultural Policy, new markets will undoubtedly emerge but testing these can be unpredictable and unnerving for farmers especially if they require significant commitment in time or finances. Total South West farm incomes have decreased by 32% between 2012 and 2016[7] with the largest contributors to the economy being milk and cattle (for meat) production at £750M and £399M respectively to a £3 Billion total, therefore these remain highly important for local employment, incomes and to continue the flow of investment into communities. Although Agriculture in the South West region in 2016 contributed 0.85% to the regional economy and employed 2.36% of the regional workforce, locally it is hugely important. Furthermore, the farmed landscape is part of the cultural heritage of the area and has shaped it into the views that now support diversified activities of Tourism or recreation.

These frameworks are presented as a simple SWOT analysis below:

	Regulation	**Agri Schemes:** **BPS, ELS, CSF, UsT etc**	**External pressures**	**Local attitudes & interest**
STRENGTHS	Represents definitive rules which are applied equally and objectively	Open to all or most farmers at some level, some may have more than one available locally More proactive	Greater awareness and support for catchment schemes or resilience of supply chains, sourcing etc	Ability to build on local, relevant knowledge and buy-in from the community. Future potential to develop other ideas if successful
WEAKNESSES	Lack of resource has meant little to no presence on the ground (EA) and lack of communication or awareness; hence very little activity Reactive	Voluntary schemes may not attract those most in need. Defra schemes consistently bureaucratic and pay late Payments are too low to influence change	Inconsistent coverage or messages resulting in piecemeal action & impact Low budgets may mean poor promotion or awareness	Can become dominated by individuals if not managed carefully and hence poorly represented
OPPORTUNITIES	To partner with others for a combined approach balancing support & advice from referrals, with regulation being the last resort	Brexit is forcing change from CAP which allows ability for new approaches to better reflect wider benefits from 'public goods'	Bringing together existing initiatives for greater coverage and momentum, demonstrating action and local results	Ability to reflect societal interests, trends or demands for change Volunteering input to embed activity and support longer term ownership
THREATS	Further resource cuts rendering it ineffective in practice Poor or inappropriate communications fail to engage	Poor delivery or management eg. RPA handling may deter uptake Budget constraints resulting in scaled back schemes	Potential to become single-focus for individuals leading it off-track Lack of evidence to demonstrate results or short term approach will fail to see full benefits	Inconsistency of support, local politics, dilution of message could miss an opportunity Rapid change of opinions will not allow real progress to be made in time

Cost of inaction

The reservoir is *the* most strategic of the three main SW supply sites, it is incredibly important to SWW for long term provision of water resource. To not act on the current declining water quality will purely mean delaying the inevitable intervention in whatever shape or form; and with an increasing population and expectations for Plymouth and the south west generally to grow by several thousand new homes, this water supply requires protection. Land use and ownership means it would be virtually impossible to acquire a suitable site to build a new reservoir, hence maintenance of the existing system is paramount.

Continued growth of the algae problem will require capital investment from SWW at Northcombe WTW to cope with associated increased operational costs but will not actually deal with the *source* of the problem. Biodiversity levels in the waterbody and margins will be impacted which may also in turn produce a decline in the WFD status – in a DrWPZ which must be protected. The reservoir has already been identified for improvements under this remit, hence Water Company investment cycles continue into the future. Ultimately the reservoir could be taken offline in extreme conditions, which will only redirect demand to other sources, but the Tavy abstraction is no longer an option, placing more pressure on the Gunnislake contribution in the summer months – the key time when algal blooms are most prevalent. Areas of North Devon served from Northcombe may not have any immediate or direct replacement.

Local values attributed to the lake for recreational and amenity purposes will be impacted negatively as a result with watersports and angling potentially untenable and aesthetic appeal causing a knock on to the domestic visitor numbers, localised spending at the café and events centre. Potentially this could cause job losses as a result and reduced facilities, losing any opportunity for future development (there is also a current planning application in place for a small holiday accommodation development behind the visitor centre which could either not go ahead or be mothballed – also reducing economic contribution to local community, jobs and investment).

The Office for National Statistics suggest Devon's population is due to increase by nearly a quarter between 2009 and 2031[8], certain areas attract disproportionate numbers and Kingsbridge Salcombe has been one such area. This trend is likely to continue. What may not keep up with this growth is the utilities infrastructure such as Sewage Treatment Works particularly in rural areas which were built to cope with much lower levels of housing, or a significant proportion of homes may be 'off-mains' and serviced by private drainage in the form of septic tanks, often with little to no maintenance and in close proximity to watercourses leading to direct inputs.

Degradation of the farmed landscape will impact farm incomes, due to a need to farm harder in order to maintain a similar level which is unsustainable. As predominantly grassland, the key issues are to first keep the soil in the fields and secondly in best possible functional health – this improves its manageability and yield, whilst reducing losses into watercourses. Degraded farmed areas will also impact the marginal corridors and natural habitats, placing pressure on species or protected areas, for example the declining area of Culm Grassland or Ancient Woodland.

Through working with and engagement with farmers and the rural sector over 25 years in the south west, Westcountry Rivers Trust can draw on experience and data to understand contributions from agriculture which may negatively impact on water quality. WFD reasons for failure may directly or indirectly result from farming practices. The evidence exists to demonstrate how interventions deliver improvements, not only to the farmer (win-wins) but also to society (ecosystem services) in general. What has been harder to quantify is the level of benefit when this is extrapolated across a

sub/catchment area, how to communicate these benefits to society in terms or language they understand, trust and can relate to, plus ultimately trying to apply a means of valuation to potential future gains which is subjective.

Economic valuation of natural assets or ecosystem services is a controversial process, some consider this a route to selling them off whereas others regard it as a means of identifying that they are of value (rather than no value) to society. As a result, various tools are being developed or trialled and this is a very topical subject, however not all are able to cope with multi-functional landscapes, scales or application. The first steps should surely be to identify the range of natural assets, aim to establish a benchmark of their current condition and extent, and then seek to understand how to achieve a positive direction of travel which is supported by a means of quantifying this. It may not be fully monetised but can assign levels of confidence (supported by existing scientific research or evidence) with levels of provision. For example, it can be confidently evidenced that excluding livestock from watercourses will be of strong benefit to in-stream water quality. The CPES project aims to evaluate and quantify change where possible to allow recommendations to farmers which will illustrate and support decision making towards increased ecosystem service delivery through incentivised schemes from interested buyers.

Economic impact of interventions

Planned interventions broadly include two main approaches, both of which utilise natural processes to increase the ability of the catchment to intercept and mitigate impacts from the land. These are widely implemented and have an extensive body of evidence in place to support the wider benefits to natural capital and the water environment as a result. These include;

Improving soil condition and raising soil indices. The approach will offer the ability for farmers to have soil testing and sampling carried out on their farms for free, the results of these and interaction with a farm advisor will provide an accurate evaluation of the state of the soil baseline. As well as standard nutrient parameters an established protocol for Soil Organic Carbon (SOC) will also provide values. These combined results will quantify and qualify opportunities to improve soil husbandry – leading to; improved farm yields, greater efficiency of manures/fertilisers from more accurate applications, reduced nutrient or soil losses from mobilisation, greater infiltration rates and the potential to quantify and increase Carbon sequestration.

Actions to increase Soil Carbon sequestration (https://www.4p1000.org/)

These could lead to potentially more stable and consistent farm incomes which revolve around soil health as the fundamental resource for production, has been improved. Interest in Carbon offsetting and zero Carbon operations has rapidly increased with Companies, Local Authorities and Industry

Sectors recognizing the need to adapt to meet growing legislation. Offsetting options in the UK are limited, some skepticism attaches to Carbon schemes as they have often been overseas and less tangible as a result. The sequestration potential for soils is huge, particularly degraded and heavily worked soils, this opportunity was highlighted in the Paris COP conference on Climate Change in 2015 which encouraged simple actions to counter the decline, which are in line with fundamental land management and environmental protection advice as regularly provided by WRT in catchment, tailored to local conditions.

Through the Climate Change Act 2008, the UK government has committed to reduce emissions by at least 80% of 1990 levels by 2050 and contribute to global emission reductions. In order to meet these targets, the government has set five-yearly carbon budgets which currently run until 2032[9]. They restrict the amount of greenhouse gas the UK can legally emit in a five-year period with progress so far often reflecting advances in technology or a shift from energy derived from fossil fuels. Simple, effective and multi-beneficial actions surely deliver optimal results for society. What this looks like locally will vary but in a rural landscape the ability to develop new markets from the land obviously present themselves, hence Local Authorities are working to bring about change as evidenced via their plans eg. Green Cornwall Biannual review or the Low Carbon Special Interest Group as part of the Devon LEP.

Strategic woodland and riparian corridor buffering. Marginal field areas tend to be either difficult to access and/or too wet to support regular grazing or production. If they are already wooded this may be natural fragments of Ancient or Semi-Ancient woodland – rich in species and trophic diversity. In the South West native broadleaved woodland does not occupy the coverage it once did, but pockets of Ancient Oak wood or diverse riparian corridors present an opportunity to expand these. Encouraging uptake of woodland in these small and undervalued areas may avoid the usual concerns for loss of productive ground and uncertainty over long term buy-in, as they are of lower production value and impractical for access year-round. Wetter areas may also cause concerns for animal welfare either due to risk from disease/parasites such as liver fluke, ticks or increased lameness.

Both woodland and natural grassland buffers act to trap nutrient and soil losses, slowing run off to the receiving waterbody, much of the case study catchments have fragmented areas of woodland which present an opportunity for expansion. Not only will this act to reduce levels of inputs triggering algal blooms in the longer term, but it will also reconnect and bolster habitat corridors and biodiversity levels. Pilot projects such Pontbren[9] in Wales have demonstrated a now well-established approach to farmer-led action to introduce woodland into grassland areas for broader environmental improvements; reducing soil and nutrient losses to watercourses, improving soil structure and infiltration. By adding woodland features to the landscape rather than large blocks may be more attractive to farmers also by managing it as Agroforestry rather than considering it purely as a long-term timber resource, it is still grazing pasture. Again, the Government has identified the benefits of woodland creation in its 25-year Environment Plan for land management, for society and for the economy – to help achieve goals for

clean air and water, but to mitigate against the effects of climate change.

In summary, to take CPES forwards and consider how to develop a market and a mechanism to capture this there is a need to also understand three levels of information regarding valuation:

1) The private benefits to farmers and land owners by taking up recommended actions

2) What level are identified external interests willing to pay for an identified and quantified benefit

3) To understand and quantify public goods whereby the public collectively pay in exchange for wider public ecosystem service benefits

There are a number of tools available for evaluation and monitoring PES but they may not all be appropriate in terms of scale or translate to a south west catchment. WRT intend to consider a number of potential tools as this is an emerging area, however the Trust has previously carried out a number of evidence reviews for Ecosystem Services and collated research to evidence benefits from common interventions for water quality. It is considered robust enough to support change at a range of scales and could provide the initial basis for application.

These are our key challenges.

References

1. SWLT, Roadford Lake Management Plan 2010-2014

2. Devon County Council https://new.devon.gov.uk/factsandfigures

3. LEP Heart of the SW, Facts and figures https://heartofswlep.co.uk/about-the-lep/facts-and-figures/

5. Office for National Statistics

6. SouthHams.com online directory

7. Defra Statistics: Agricultural facts – South West
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697021/regionalstatistics_southwest_04apr18.pdf

8. Devon County Council, Populations estimate and projections http://www.devon.gov.uk/jsna_-_section_3_-_devon_overview.pdf

9. Committee on Climate Change, Reducing UK emissions 2018 report to Parliament
https://www.theccc.org.uk/publication/reducing-uk-emissions-2018-progress-report-to-parliament/

9. Woodland Trust, Pontbren Project https://www.woodlandtrust.org.uk/publications/2013/02/the-pontbren-project/