WORKING WITH COMMUNITIES, BUSINESS AND GOVERNMENT FOR HEALTHY RIVERS

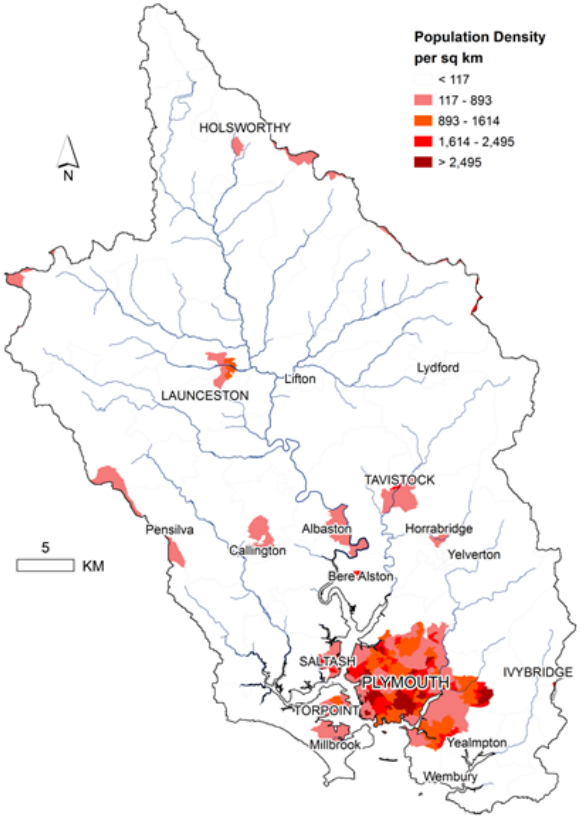
The Tamar Catchment Partnership

Collaborative Local Governance:

Co-creation in Catchment Partnerships

In 2009-10, WRT worked with researchers from the Rural Economics and Land Use (RELU) Project to develop a framework for Catchment Partnership working – this was further developed during the 2012 Tamar Catchment Pilot – one of the 1st truly co-created catchment action plans..!!

The Tamar Catchment: 1,800km² and 300,000+ people



Forestry Commission

Tamar grow local

Environment Agency

one and all owen hag all CORNWALL COUNCIL

ramblers at the heart of walking

City of Plymouth

West Devon Borough Council

UEA University of East Anglia

Westcountry Rivers Trust

SOUTH WEST WATER

WOODLAND TRUST

Tamar Canoe Association

A clear solution for farmers CATCHMENT SENSITIVE FARMING

The University of Plymouth

swlakestrust

South Hams District Council

NATURAL ENGLAND

The Arundell Arms HOTEL AND RESTAURANT

The wildlife TRUSTS Devon

TAMAR ESTUARIES CONSULTATIVE FORUM OUR COMMON ASSET

Wild by design

Moor Trees

Devon County Council

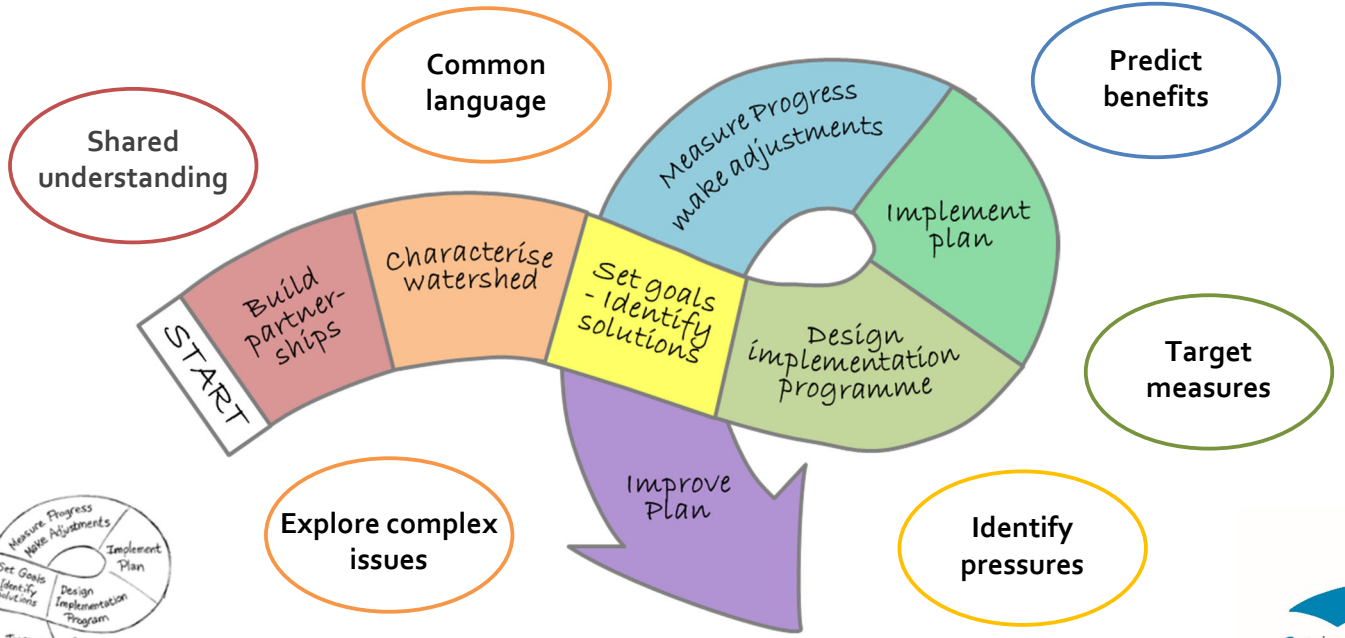
PML Plymouth Marine Laboratory

DUCHY of CORNWALL

NFU

Adaptive Catchment Management

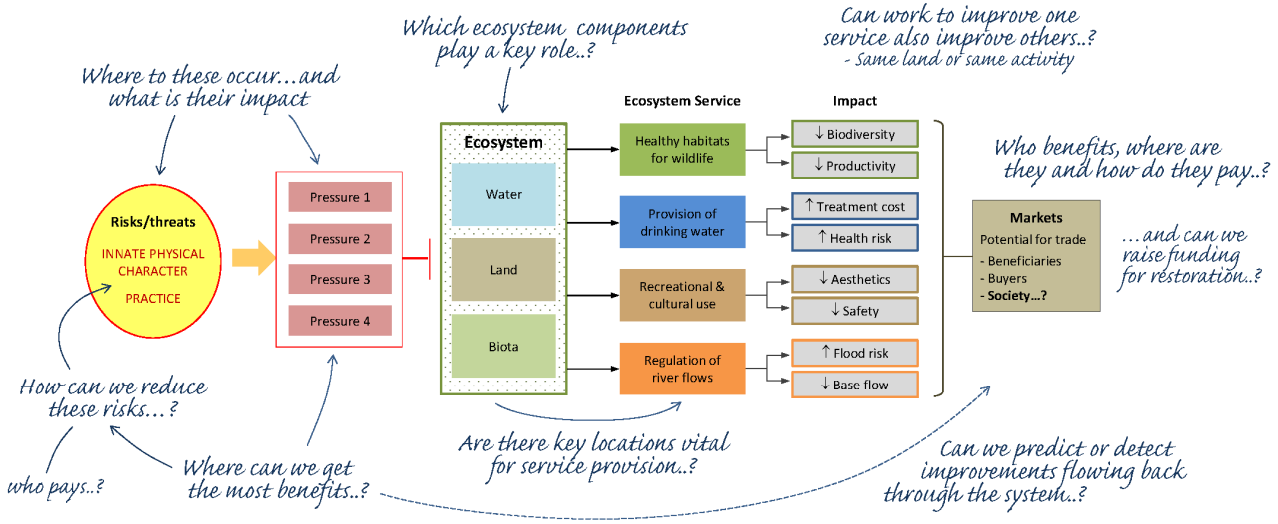
The Tamar was an early pioneers the Catchment Based Approach (CaBA) in 2010-2012 - We adapted the US-EPA Adaptive Management Cycle for use by CaBA.

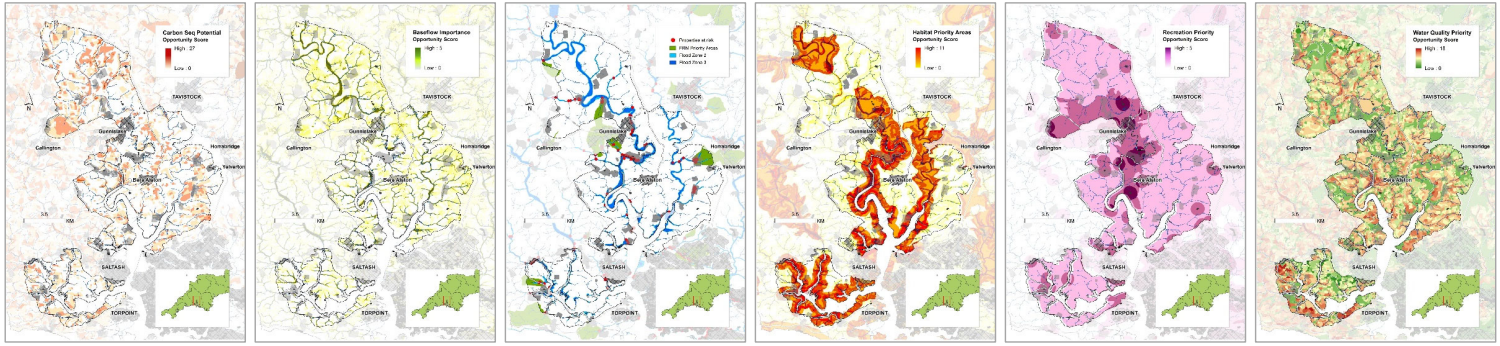


US EPA , 2005

Catchment Based Approach
Partnerships for Action

For the Tamar Pilot, WRT developed a Participatory Ecosystem Services Framework…






…which after >70 hours of co-creation workshops and evidence review, led to the development of the **Tamar Catchment Vision** & **Action Plan**…

Catchment Action Plan 2012 ...1

Intervention/measure	Delivery approach	Potential outcomes	Potential CADOs	Where/targeting	Current funding	Future changes
Statutory environmental standards & restrictions - *WFD Status* - *Bathing water standards* - *Nitrate Vulnerable Zones* - *DrWPAs* - *Cross Compliance*	Regulation Advice & guidance *Good/best practice*	WFD ↑ *Water quality* ↑ *Ecosystem health* Nitrates Directive ↑ *Water quality* ↑ *Ecosystem health* Bathing Water Directive ↑ *Bathing water safety* ↑ *Economic prosperity*	Government bodies *EA, NE, RPA* Local Authorities Private companies *e.g. South West Water, land managers/farmers*	Many environmental regulations apply to all areas and to both point and diffuse sources Other regulations (e.g. Cross Compliance and Nitrate Vulnerable Zones) place restrictions on practice on specific land areas	Regulatory bodies are funded by the Government Private companies and farmers are key participants in the regulatory process and often work proactively to prevent problems	Increased regulatory activity, regulatory stringency or negotiated alterations to environmental permits may increase compliance CAP reform may increase the regulatory requirements of Cross Compliance under Pillar 1 (SPS)
Statutory habitat protection through designation - *SPAs/SACs/Ramsar* - *SSSIs* - *Local Wildlife Sites*	Regulation Incentivisation *e.g. Payments for Ecosystem Services* Advice & Guidance *Good/best practice*	Species & Habitats Dir. NEWP National Planning Policy Framework ↑ *Biodiversity* ↓ *Compensation required* Green Infrastructure ↑ *Health & wellbeing* ↑ *Recreation & leisure*	Conservation charities *Wildlife Trusts, South West Lakes Trust, Local Record Centres, other designated site management bodies* Government bodies *EA, NE, Forestry Commission* Local Authorities NGOs *National Park, AONB, TECF*	Existing designated sites Important habitats should be identified and could receive protection New habitats must be assessed to determine whether they could receive protection	Government bodies bear the responsibility for the designation and assessment of protected sites and landscapes Private companies, landowners and farmers are key participants in the management and protection of designated sites	Pillar 2 of the CAP (agri-environment funding) makes a key contribution to the management of designated sites and changes in the methods used to target these funds or changes resulting from CAP reform will need to carefully managed to ensure maximum benefits are realised in the catchment
Wetland habitat creation and/or restoration - *floodplain/riparian* - *upland/peatland* - *ponds/storage* - *river channel* Woodland habitat creation and/or restoration On-farm habitat creation and/or management - *hedgerows* - *habitat plots* - *ditches & drains*	Incentivisation *e.g. Payments for Ecosystem Services* Advice & Guidance *Good/best practice*	Species & Habitats Dir. NEWP / Lawton ↑ *Biodiversity* WFD / DrWPAs ↑ *Water quality* ↑ *Bathing water quality* ↑ *Ecosystem health* Water Resources ↓ *Flood risk* ↑ *Baseflows* Green Infrastructure ↑ *Health & wellbeing* ↑ *Recreation & leisure*	Conservation charities *Wildlife Trusts, Westcountry Rivers Trust, South West Lakes Trust, other bodies* Private companies *South West Water* Government bodies *EA, NE, Forestry Commission* Local Authorities NGOs *National Park, AONB, TECF*	Catchment Partnership Steering Group using Tamar Plan Priority Areas ↑ *Suitability* *i.e. as defined by physical & social factors in the landscape* ↑ *Opportunity* *i.e. potential collaboration, funding and/or integration* ↑ *Priority* *i.e. important area for the provision of single or multiple ecosystem services* Re-targeting existing funding streams into the priority areas identified in the Tamar Plan may realise enhanced cost-benefits	Private funding *South West Water Developers (e.g. Section 106)* *Biffa/other companies* Government funding *Environmental Stewardship* *Woodland Grant Scheme* *FRM Grant-in-aid* Charitable funding *Donations* *Project funding*	Increased government (DEFRA, DWI, OFWAT, EA, NE) support for PES schemes will increase funding from the private sector CAP reform may increase the potential for habitat creation under Pillar 1 (SPS) Increased priority may be given to Biodiversity Offsetting payments within the CIL and Section 106 agreements Government intervention may be required to gain ↑ access to a proportion of the FRM Grant-in-Aid budget for land-based measures

Catchment Action Plan 2012 ... 2

Intervention/measure	Delivery approach	Potential outcomes	Potential CADOs	Where/targeting	Current funding	Future changes
Landuse change and/or extensification of agricultural practice - *Reduced tillage* - *Reduced fertiliser use* - *Reduced stocking rates* - *Reduced pesticide use*	Incentivisation *e.g. Payments for Ecosystem Services* Advice & Guidance *Good/best practice*	WFD / DrWPAs ↑ *Water quality* ↑ *Bathing water quality* ↑ *Ecosystem health* Climate Change ↑ *Carbon sequestration* ↓ *GHG emissions* Species & Habitats Dir. NEWP / Lawton ↑ *Biodiversity*	Conservation charities *Wildlife Trusts, Westcountry Rivers Trust, South West Lakes Trust, other bodies* Private companies *South West Water* Government bodies *EA, NE, Forestry Commission* NGOs *National Park, AONB, TECF*	Catchment Partnership Steering Group using Tamar Plan Priority Areas ↑ *Suitability* *i.e. as defined by physical & social factors in the landscape* ↑ *Priority* *i.e. important area for the provision of single or multiple ecosystem services*	Private funding *e.g. South West Water* Government funding *Environmental Stewardship* *Woodland Grant Scheme* *FRM Grant-in-aid* Charitable funding *Donations* *Project funding*	Increased government (DEFRA, DWI, OFWAT, EA, NE) support for PES schemes will increase funding from the private sector The establishment of voluntary local carbon trading schemes will require DECC to change CDM rules
Investment in on-farm infrastructure - *Yard infrastructure (slurry pits, feed storage, sheds)* - *Fencing & drinking points* - *Tracks & bridges* - *Clean & dirty water*	Regulation Incentivisation *e.g. Payments for Ecosystem Services*	WFD ↑ *Water quality* ↑ *Ecosystem health* Nitrates Directive ↑ *Water quality* ↑ *Ecosystem health* Bathing Water Directive ↑ *Bathing water safety* ↑ *Economic prosperity*	Conservation charities *Wildlife Trusts, Westcountry Rivers Trust, FWAG SW* Government bodies *EA, NE, Catchment Sensitive Farming* Private companies *e.g. South West Water, land managers/farmers*	Catchment Partnership Steering Group using Tamar Plan Priority Areas ↑ *Opportunity* *i.e. potential collaboration, funding and/or integration* ↑ *Priority* *i.e. important area for the provision of single or multiple ecosystem services*	Private funding *e.g. South West Water* Government funding *Environmental Stewardship* *CSF* Charitable funding *Donations* *Project funding*	Increased government (DEFRA, DWI, OFWAT, EA, NE) support for PES schemes will increase funding from the private sector Current funding levels for CSF and other Government funded activities will need to be maintained and strategically targeted
Good/best farming practice advice & guidance - *Fencing & drinking points* - *Tracks & bridges* - *Clean & dirty water*	Advice & Guidance *Good/best practice*	Could enhance the provision of all ecosystem services from participating land areas WFD ↑ *Water quality* ↑ *Ecosystem health*	Conservation charities *Wildlife Trusts, Westcountry Rivers Trust, FWAG SW* Government bodies *EA, NE, CSF, Soils for Profit* Private companies *South West Water*	Catchment Partnership Steering Group using Tamar Plan Priority Areas ↑ *Priority* *i.e. important area for the provision of single or multiple ecosystem services*	Private funding *e.g. South West Water* Government funding *Environmental Stewardship* *CSF* Charitable funding *Donations* *Project funding*	Increased government (DEFRA, DWI, OFWAT, EA, NE) support for PES schemes will increase funding from the private sector
Green/blue infrastructure creation and/or enhancement Creation and/or enhancement of recreational & cultural infrastructure	Regulation *National Planning Framework* Incentivisation *e.g. Payments for Ecosystem Services*	Species & Habitats Dir. NEWP National Planning Policy Framework ↑ *Biodiversity* Green Infrastructure ↑ *Health & wellbeing* ↑ *Recreation & leisure*	Local authorities Conservation charities *Wildlife Trusts, SWLT* Government bodies *EA, NE* NGOs *National Park, AONB, TECF*	Catchment Partnership Steering Group using Tamar Plan Priority Areas ↑ *Priority* *i.e. important area for the provision of single or multiple ecosystem services*	Publically accessible green and blue spaces are largely funded by local authorities and landscape management bodies such as TECF, the AONB and National Park Authorities	New funding streams could be realised through Visitor Payback schemes, Tourism Taxes and private sector investments

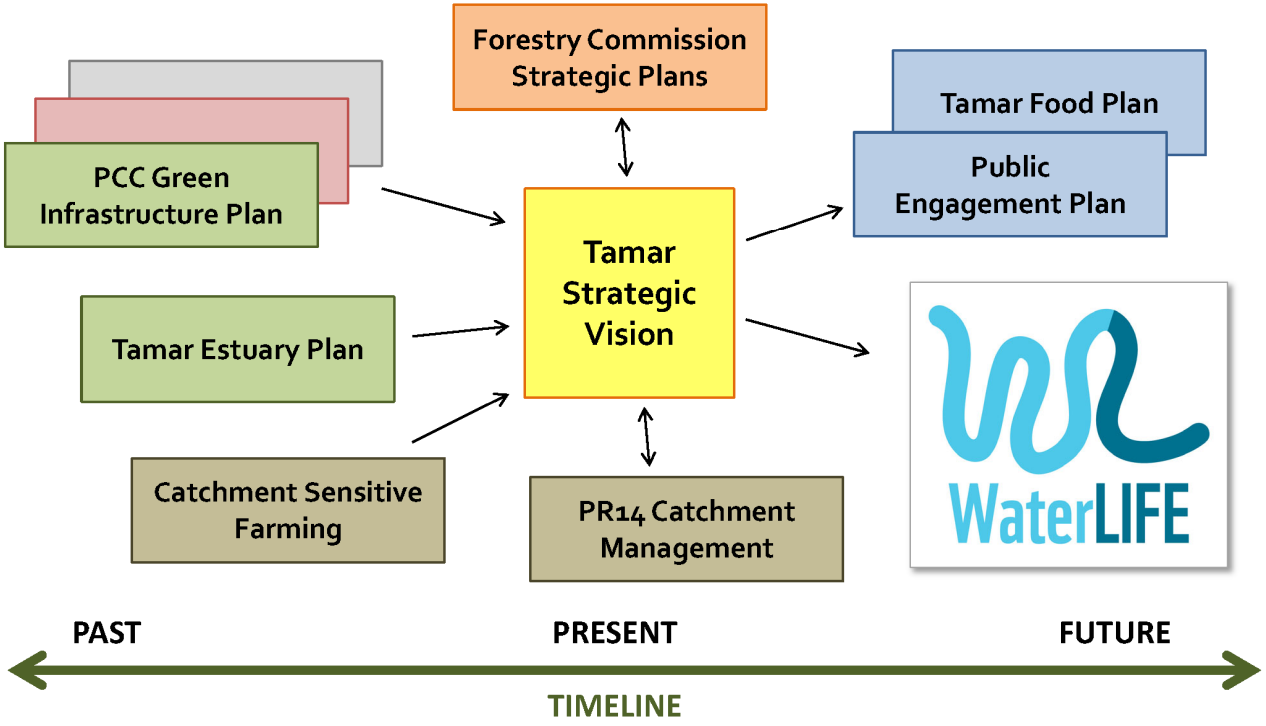
WORKING WITH COMMUNITIES, BUSINESS AND GOVERNMENT FOR HEALTHY RIVERS

Catchment Action Plan 2012 ...3

Intervention/measure	Delivery approach	Potential outcomes	Potential CADOs	Where/targeting	Current funding	Future changes
Establishment of a local accredited Tamar food brand	Education to effect societal change Incentivisation Regulation	Could enhance the provision of all ecosystem services from participating land areas Could contribute to all statutory targets including WFD and Habitats Directive	Conservation charities NGOs *Tamar Grow Local* Private companies *Various food producers, food processors, logistics and consumers* Local Authorities	Catchment Partnership Steering Group using Tamar Plan Priority Areas ↑ *Suitability* *i.e. as defined by physical & social factors in the landscape* ↑ *Opportunity* *i.e. potential collaboration, funding and/or integration* ↑ *Priority* *i.e. important area for the provision of single or multiple ecosystem services*	Currently little strategic funding for local food initiatives designed to enhance the provision of ecosystem services	Catchment-based Quality Assurance/Accreditation Scheme will need to be established and evidence of the environmental benefits will have to be gathered to obtain Government recognition and backing for the approach The acquisition of strategic funds to facilitate the establishment of the catchment food brand is vital to its successful implementation
Public engagement & environmental education	Education to effect societal change	Could enhance the provision of all ecosystem services from participating land areas Could contribute to all statutory targets including WFD and Habitats Directive	All CADOs engaged in the Tamar Catchment Planning process could play a role	The aim will be to bring about changes in behaviours within the wider Tamar public, which will in turn, facilitate the improvement of raw water quality within the catchment through effecting societal change	What activities are currently undertaken in the catchment are currently delivered in a piecemeal manner by individuals or organisations acting in isolation, but several groups, such as TECF and some charities have had funds to deliver engagement and education more strategically	Change will rely on appropriate drivers (incentives) being promoted, such as financial gain, pro-environmental social norms1 or a personal 'feel-good' factor. Addressing barriers to change and encouraging members of the public to take ownership of water quality protection will be at the heart of the plan's objectives The acquisition of strategic funds to facilitate the delivery of the plan will be vital to its success

Timeline: the shared strategic vision & delivery action plans

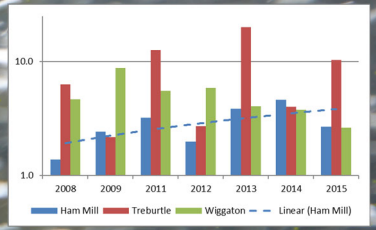
The final Tamar Strategic Plan will need integrate existing delivery plans with a number of new delivery plans



Timeline: the shared strategic vision & delivery action plans

Tamar Fisheries Plan

A Your Fisheries Pilot




NORTH WYKE
ROTHAMSTED RESEARCH
Tamar Valley Organic Group
A soil carbon sequestration study
WaterLIFE

Looking after the land to protect our rivers

Upstream Thinking

What's going into the river?

Peat
Rainstorms on damaged moors can lead to tea-coloured water which can still be detected 80km away.

1 = 50
Bacteria
One cow has the pollution potential of 50 people. There are 900,000 cows in Devon and Cornwall.

30km
Pesticides & fertiliser
Just a few drops of pesticide can be detected 30km away in the river.

How can we keep these things on the land?

14,184 water-retaining ditch blocks built

133km of ditches blocked up on Exmoor

Peat-building Sphagnum moss increased by 62%

2,000 hectares of moorland surveyed and 1,100 hectares restored

Restored peatland releases water more gradually after storms

Tea colour is reduced by 15% due to reduced stormwater run-off

RESERVOIR

ON THE MOORS:

Restoring peatland holds back water and prevents the release of CO_2

ON LOWLAND FARMS:

Working with farmers to prevent pollution of rivers

Cleaner water at the water treatment works

In Cornwall, 400 water samples helped identify the source of 89% of pesticide problems and target efforts to fix them

144 alternative water supplies for cows to keep them out of the river

50km of bankside fencing built in Tamar, Fowey, Wimbleball and Otter river catchments to keep cows out of rivers

120 hectares of wildlife-rich grassland have been restored in North devon

Tussocky Culm grassland holds five times more water than intensively managed grassland

Across the South West 54,000 hectares of farmland are now being farmed in ways that prevent pollution

Why does it matter?

Tap water quality
The drinking water standard for pesticides (EU) is 0.10ug/l – that's equivalent to one baked bean in 21 million cans.

Lower costs
Water from a less sensitively farmed catchment costs £120 per megalitre to treat while the cost from the cleanest catchment in the region is £60/ML.

Good for wildlife
27% increase in Dunlin on Dartmoor – a rare wading bird that is under threat.

Good for the planet
A square metre of 40cm-deep peat holds a wheelbarrow load of carbon. Peatland restoration helps to store carbon, reducing greenhouse gas emissions.

Figures are from the period Upstream Thinking work in 2010–2015

upstreamthinking.org

Westcountry Rivers Trust · Cornwall Wildlife Trust · Devon Wildlife Trust · Exmoor National Park · Exmoor Mires Partnership

South West Water

Looking after the land to protect our rivers

Upstream Thinking

What's the problem?

Unwanted soil, silt, pesticides, fertilisers and animal waste in the rivers increase water treatment costs.

They cause discolouration and unpleasant tastes which must be removed through water treatment to meet the high standards we all expect. Building new treatments costs £millions and can be expensive to run, impacting on customers' bills.

What's the answer?

Working with landowners, we can make changes to how land is managed to keep unwanted things out of rivers.

Starting on the high moorlands and focusing on the land next to rivers, we can make a water management plan that protects streams and rivers while keeping farms productive.

EXAMPLES OF HOW WE ARE MAKING THINGS BETTER

RESTORED PEAT BOGS
When peat is wet the carbon is safely locked up in the bogs, storing water and releasing it slowly back into the rivers, which can also help alleviate flooding downstream.

On the moors of Exmoor and Dartmoor we've restored bogs so water is released more slowly with less peat dissolved organic carbon (peat) in it.

£2.2m
CAPITAL GRANTS
Farms often need investment so we make grants of up to 50% to make improvements such as slurry storage, river fencing and better pesticide management.

Since 2008 we've made 1,700 visits to farms and allocated 180 capital grants totalling £2.2 million, enabling farmers to access funding from other sources.

RESULTING BENEFITS

IMPROVED WATER QUALITY
After taking part in the project, water quality at one farm was even cleaner downstream than it was upstream. Monitoring is showing increases in plant and animal life like dragonfly larvae and mayfly which are indicators of clean water in our rivers.

HEALTHY PEAT BOGS THAT HOLD WATER
Bogs hold a third more water post-restoration, release a third less carbon into the water, and release water more slowly, supporting summer water levels in the rivers.

BETTER HOMES FOR WILDLIFE
Bees, butterflies and birds appreciate nectar-rich buffer strips planted between fields and rivers. Fish and invertebrates are more likely to breed and thrive – providing food for otters and kingfishers.

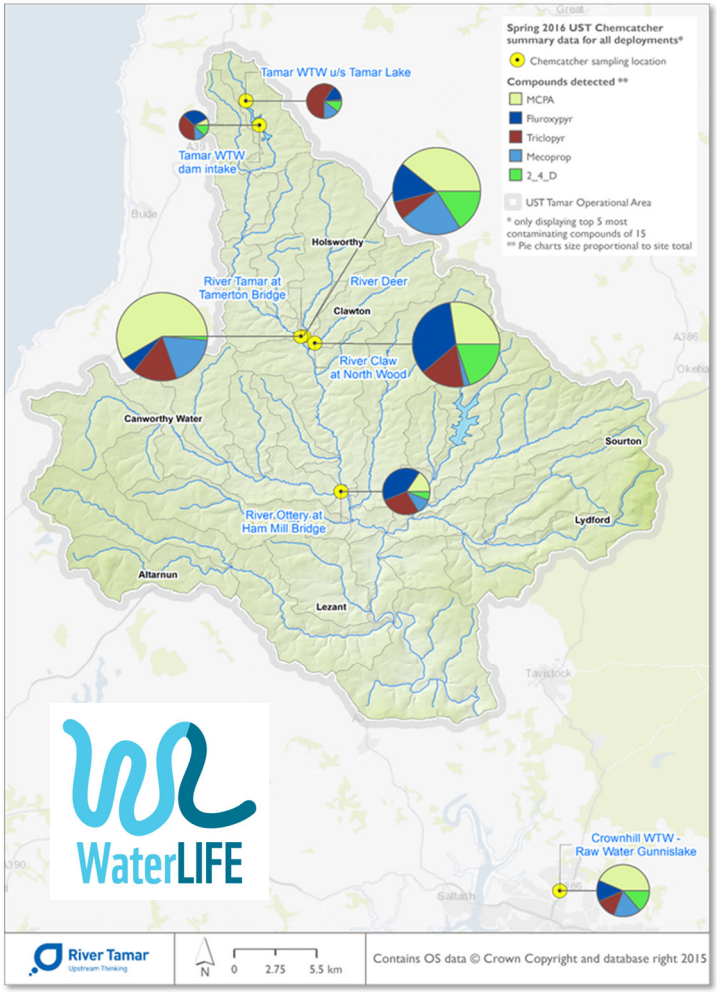
£p
LOWER COSTS
Upstream Thinking is part of a long-term sustainable approach to managing costs by reducing ongoing maintenance or delaying large capital investments, helping to keep customers' future bills down.

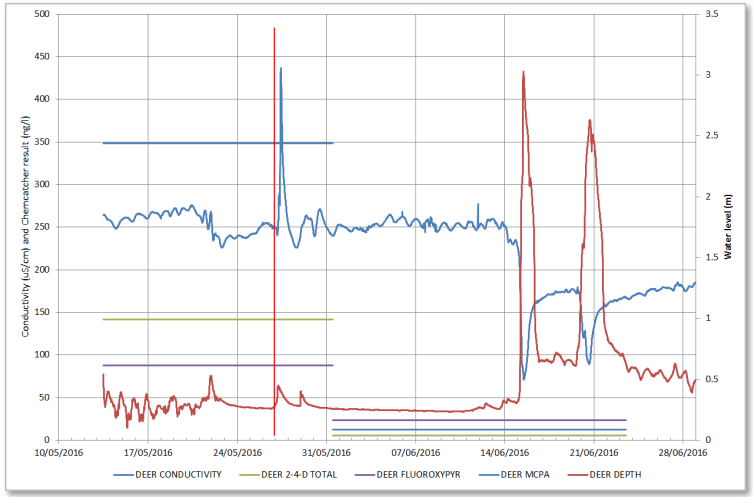
upstreamthinking.org

Westcountry Rivers Trust · Cornwall Wildlife Trust · Devon Wildlife Trust · Exmoor National Park · South West Water

WORKING WITH COMMUNITIES, BUSINESS AND GOVERNMENT FOR HEALTHY RIVERS

Life · Westcountry Rivers Trust · Save the Rivers Trust · WWF





SCORECARD NOVEMBER 2015 TO NOVEMBER 2016

Site No.	River	Site Name	TDS	SS	PO4	COL	OVERALL
2	Deer	North Tamerton	9	8	9	8	8.5
1	Upper Tamar	North Tamerton	8	9	7	9	8.3
3	Claw	Northwood	6	7	3	7	5.8
5	Ottery	Ham Mill	5	5	8	5	5.8
10	Carey	Heale Bridge	2	6	4	6	4.5
4	Inny	Trekenner	7	2	6	2	4.3
18	Ottery	Higher Penrose	3	4	5	4	4.0
7	Kensey	St Leonards	4	3	2	3	3.0
11	Lyd	Lifton Wood Park	1	1	1	1	1.0

Join us to celebrate our rivers at the Tamar Festival this autumn

Cotehele Quay - 10th October 2015

11am to 4pm – entry FREE

We're on a voyage of discovery to find out what it means to be Tamar People; from water & wildlife to food & produce, and from arts & heritage to recreation.

At the Festival we'll be showcasing all of the vital work being done to protect our rivers for future generations, and celebrating the vast array of local produce, art and community-based activities that surround and depend on this iconic 60-mile-long stretch of water.

There will be lots to see and do, so come and share your Tamar stories and find out how you can get involved!

Find out more:

Web: www.my-tamar.org Twitter: @WestcountryRT
Facebook: My Tamar Instagram: my_tamar
Email: lucy@my-tamar.org

A ferry trip, a riverside sunset, muddy wellies or brushing your teeth in the morning. The Tamar means something different to all of us.

This summer we want to find out just how far the river runs through all our lives, so we can keep the Tamar flowing.

Use your stencil, tell us a story

Show us what mark the Tamar has made on you, your family or your business. Hold up this stencil, frame up your Tamar story in the gap and take a snap.

Share and win

Once you've captured your river story in a picture, share it on Twitter or Instagram, with the hashtag #MyTaMARK.

TaMARK Festival

The best snap wins a hamper of Tamar Grow Local goodies worth £100, to be announced on TaMARK Festival, 10th October.

+

Find out more about making your TaMARK, our mission to capture the spirit of the Tamar and how together we can make our mark on the river's future.

www.my-tamar.org
@WestcountryRT
Facebook: My Tamar

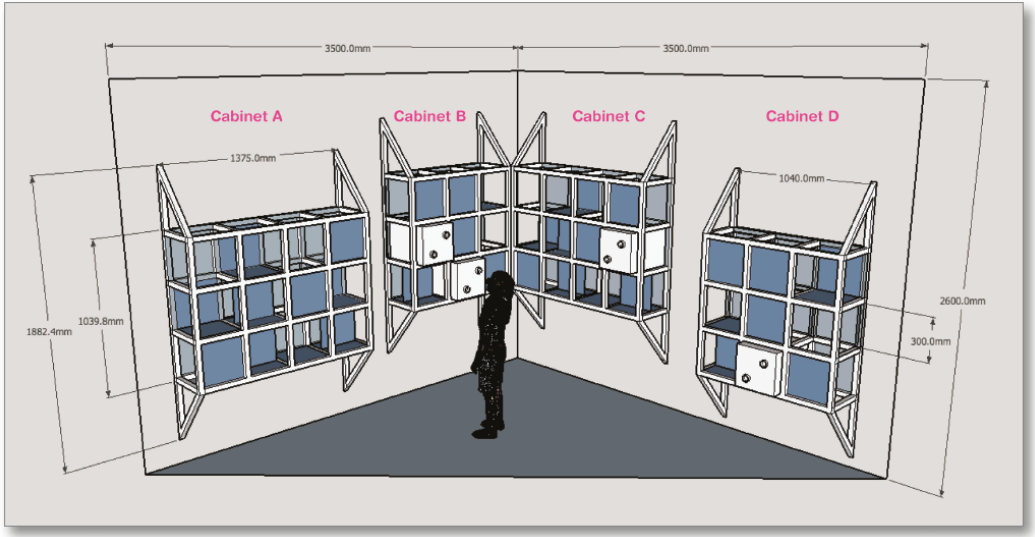
Engaging People

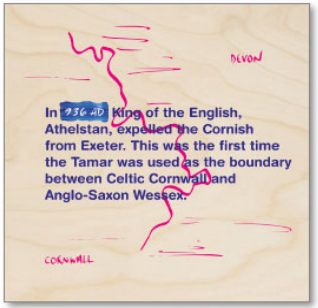
TAMAR

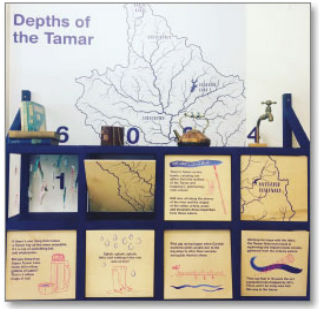
Education at Upper Tamar Lake

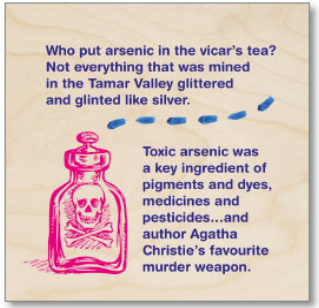
Funded by WaterLIFE, the design, build and installation of an educational exhibit was commissioned to be displayed in the visitors centre at the Upper Tamar Lake.

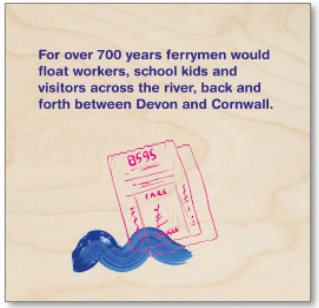
The overall objective was to engage the public with a narrative based around the River Tamar and its surrounding landscape, which could include elements of science, history, natural history, stories & art











Outreach at Events, Festivals & Shows

The Tamar Partnership have delivered educational activities to people of all ages at events & shows across the catchment.

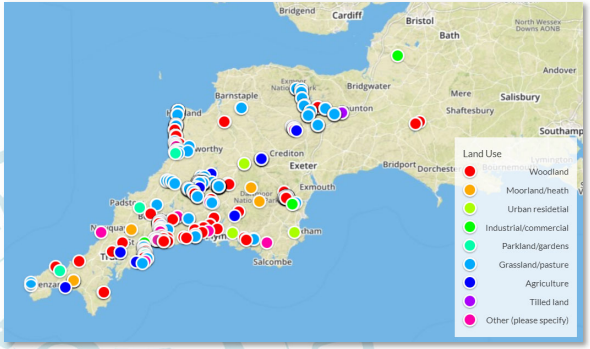
We now have a fully equipped mobile laboratory in our show trailer, with sampling equipment, microscopes and interactive exhibits of all kinds…

Westcountry CSI

A ground-breaking citizen science programme…

Originally piloted on the River Tamar as 'Tamar CSI' with funding from the National Lottery… Westcountry CSI now covers the whole of the Westcountry (Cornwall, Devon and parts of Somerset and Dorset)…

1,050 CSI surveys carried out in 2018 – covering 20% of SW waterbodies…



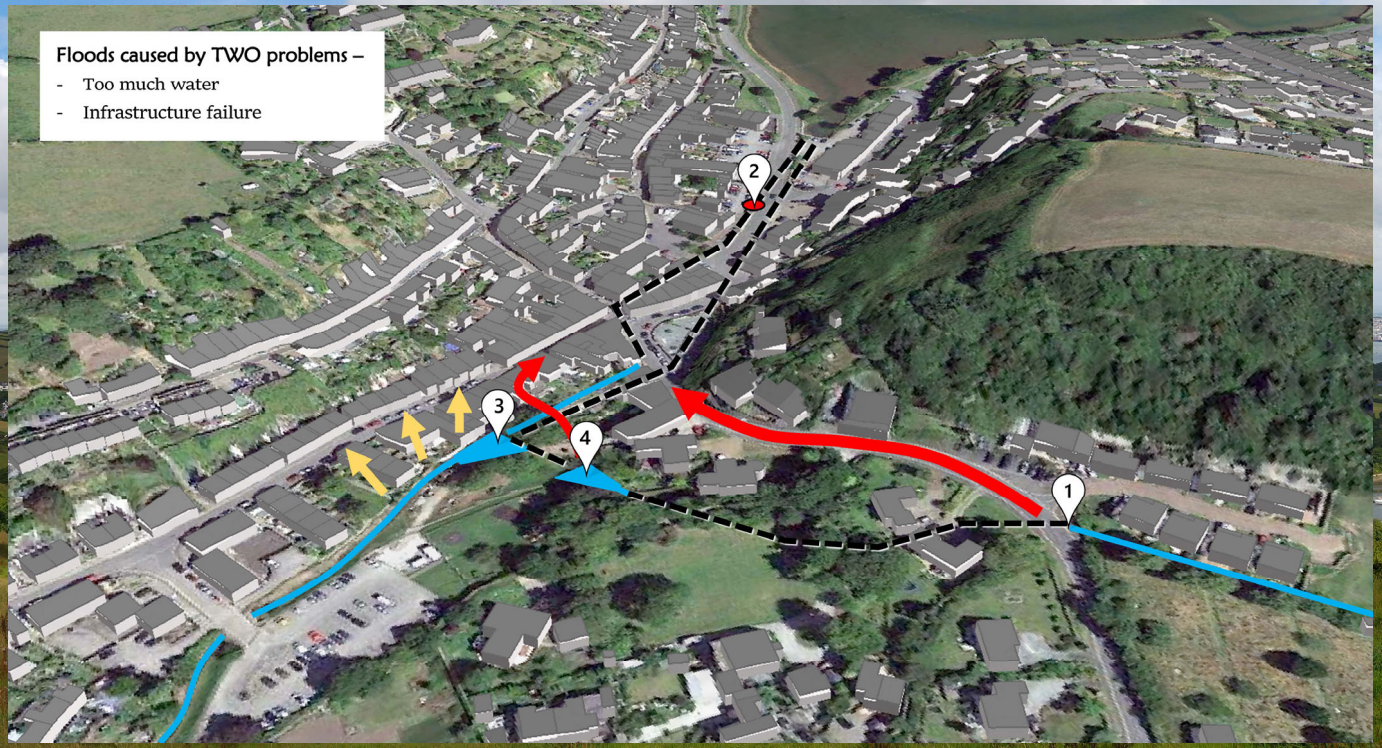
Westcountry C.S.I.
Citizen Science Investigations

Co-creating a community NBS & GI Plan for Millbrook

- Millbrook River Catchment, Cornwall
- 2016-2018
- Community engagement
- Evidence review
- Interactive flood modelling
  + a ‘Serious Game’

https://issuu.com/westcountryriverstrust/docs/millbrook-workshop-2016?e=0

The Nature of Millbrook

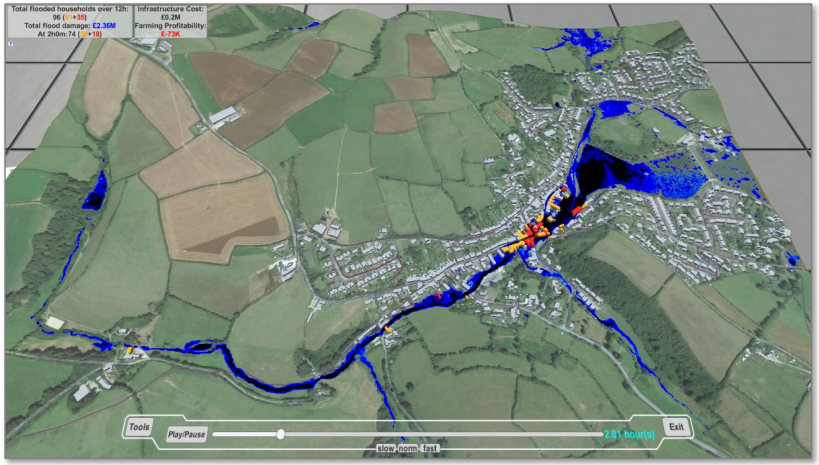


WORKING WITH COMMUNITIES, BUSINESS AND GOVERNMENT FOR HEALTHY RIVERS
WWF
RIVERS TRUST
Westcountry Rivers Trust
Life

Co-creating a community NBS & GI Plan for Millbrook

Co-creation and trialling the Millbrook Serious Game -

- ⇨ Developed by Centre for Water Systems at Exeter University
- ⇨ Interactive, educational 'game' that illustrates movement of water through catchment and village over time
- ⇨ Ability to change land use and investment to drainage infrastructure within different parts of the catchment
- ⇨ Trialled by local stakeholders



Paper published in December 2018
http://www.mdpi.com/2073-4441/10/12/1885/pdf

water

MDPI

Article

A Serious Game Designed to Explore and Understand the Complexities of Flood Mitigation Options in Urban–Rural Catchments

Mehdi Khoury [1,*], Michael J. Gibson [1], Dragan Savic [1,2], Albert S. Chen [1], Lydia Vamvakeridou-Lyroudia [1], Harry Langford [3] and Sarah Wigley [4]

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Abstract: Flood prevention in mixed urban–rural environments has become a greater concern due to climate change. It is a complex task requiring both efficient management of resources and the involvement of multiple stakeholders from diverse backgrounds. As Serious Games (games used for purposes other than mere entertainment) have emerged as an effective means of engaging stakeholders, this work proposes a new Serious Game applied to flood mitigation in the village of Millbrook in the UK. Results show that the game has both an informative and a transformative effect (statistical significance levels from 0.01 to 0.05), improving participants' understanding of the problem, and helping them to find a new and improved approach to flood risk management in Millbrook, with the potential to improve resilience significantly. Furthermore, the game successfully transformed participants into "citizen scientists" in the purest sense of the term—it led them to

Timeline: the shared strategic vision & delivery action plans


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