South East Rivers Trust

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Urban River Restoration.

wandle trust

The South East Rivers Trust is an environmental charity dedicated to conserving and restoring rivers and their catchments across the south east of England.

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Introduce myself: Dr Chris Gardner, >15 years experience fisheries scientist.

Introduce the Rivers Trusts, history of Rivers Trust movement:

1. The Rivers Trust was launched in 2001 by four river trusts: the Eden Rivers Trust, Tweed Foundation, Westcountry Rivers Trust, and the Wye and Usk Foundation. These organisations formed in response to the decline in salmon populations through the 1990s.

2. Rivers Trusts proved to be very effective at delivering river improvements and securing funding unavailable to others.

3. The Rivers Trust (RT) is a registered charity and an umbrella organisation for rivers trusts concerned with rivers in England and Wales.

4. This provided a more strategic approach to rolling out the Rivers Trust model nationally.

5. Currently 47 trusts nationwide.

THE RIVERS TRUST
the umbrella body of the rivers trust movement
where there's water there's life

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Introduce the South East Rivers Trust (formerly Wandle Trust)

Who we are:

Nick Hale , Bella Davies, Toby Hull, Chris Gardner, Tim Longstaff, Polly Bryant, Moragh Stirling, Alan Martin & David Gill

Our mission is for the rivers in the South East Rivers Trust area to achieve Good Ecological Status or Potential (WFD), and the management of their catchments to set… the highest… international standards for urban and rural community-driven sustainability and environmental excellence in river rehabilitation and restoration.

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Where we work: South East Rivers Trust.

- SERT host/co-host the DEFRAs Catchment Based Approach (CaBA) initiative in 10 catchments:

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How we work:

- Use data and evidence to identify priority issues.
- Source funding: EU (Intereg) grants, Heritage Lottery Fund, DEFRA, EA, environmental levees (*e.g.* landfill tax, plastic carrier bag tax) etc.
- Work in partnership with councils, landowners, angling clubs etc. to provide match funding.
- Deliver on-the-ground improvements to address the issues and meet everyone's objectives.

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Problems with Rivers & Especially Urban Rivers.

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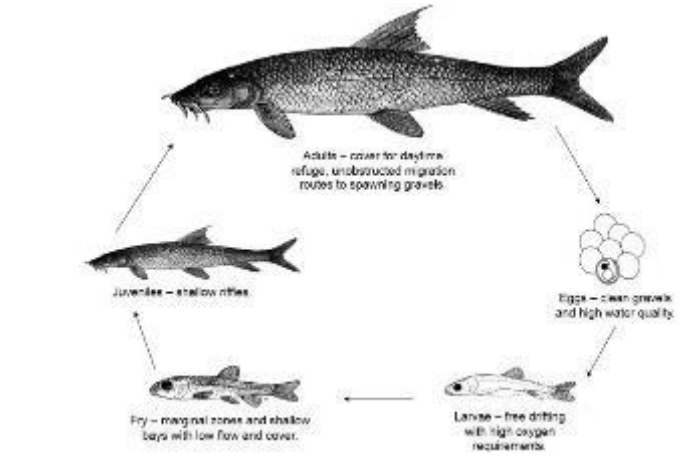
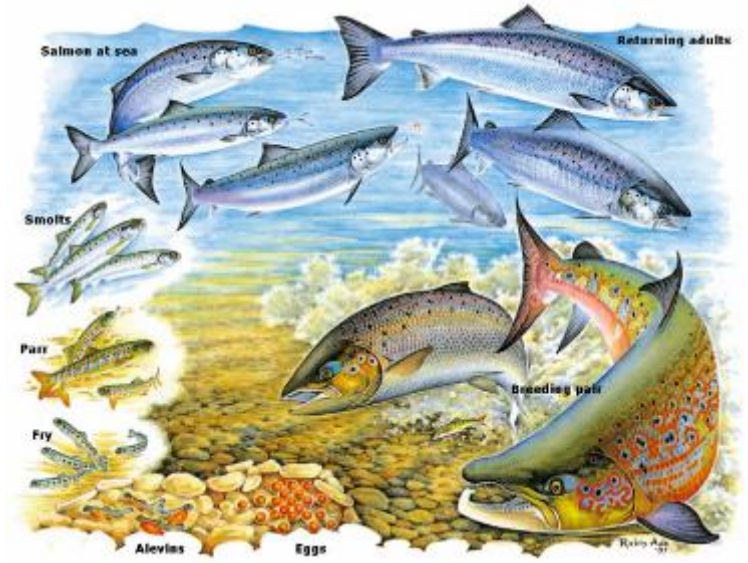
Fish population dynamics and limiting factors.

- Fish populations are highly mobile, migrating from nursery habitats to habitats appropriate for all life stages in a continuous cycle, catchment wide.
- Fish produce many eggs due to the many pressures affecting survival.
- Only a few survive to become adults, due to population bottlenecks.





Pollution incidents

Eutrophication

Habitat - Q&Q

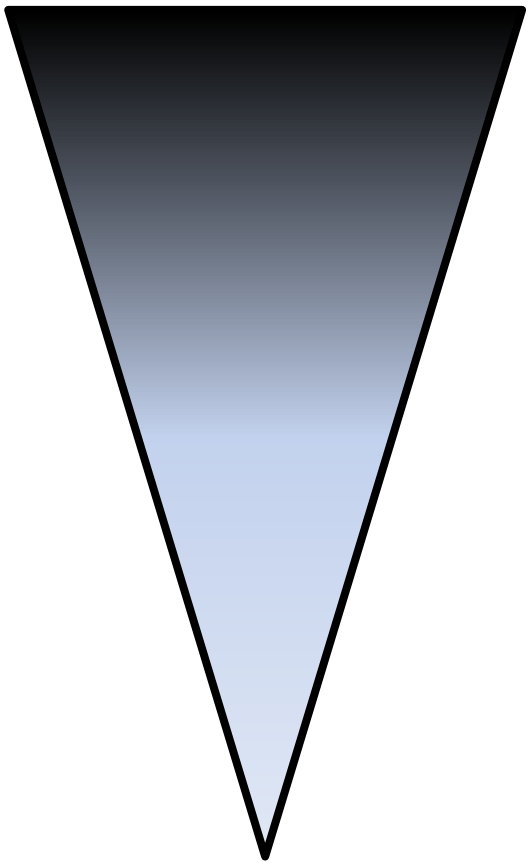
Pesticides

Predation

High flow wash out

Diffuse pollution

Water - Q&Q



River Modification impacting habitat for Fishes.

- River modification for human use has degraded habitats resulting in uniform river environments with regard to both physical form and water flow, limiting the quantity and quality of habitats required for certain life-stages and thus limit populations.

Examples:

1. Navigation (dredging, straightening, impoundments and barriers);
2. Agriculture (embankments disconnecting rivers from their floodplains);
3. Flood Risk Management (levee construction, debris removal [reduces complexity]);
4. Urbanisation/Land drainage (artificially high peak flows);
5. Abstraction/Water transfer (flow regulation, modification of hydrograph);
6. Power Generation (barriers, impoundments, entrainment/impingement).

- Changes in river morphology generally shift riverine ecosystems from lentic (slow flowing) towards lotic (fast flowing) environments and reduced longitudinal and lateral connectivity.

- River modification has limited specialised habitats *e.g.* development in the floodplain for conurbation and agriculture has limited marginal transitional habitats and floodplain waterbodies like oxbow lakes.

- And physical barriers *i.e.* weirs can limit fishes access to essential habitats and therefore limit populations.

Fish Populations and Rivers.

Fish evolved in unmodified rivers and are therefore reliant on the habitat features of unmodified rivers for their survival.

Bream habitat requirements.

- Lowland river species (low flow),
- Spawn in floodplain waterbodies *e.g.* oxbow lakes,
- Juveniles remain in these floodplain waterbodies until mature,
- Adults migrate moving large distances between seasonal habitats.

Therefore, impacted by modification of floodplains for agriculture and urbanisation (loss of floodplain waterbodies) and barriers to their migration.

Barbel habitat requirements.

- Middle reach species (moderate flow),
- Spawn on gravel riffles,
- Fry require shallow off-channel areas,
- Juveniles require riffles (cover, foraging),
- Adults require cover (daytime refuge areas),
- Adults migrate upstream to spawn.

Therefore, impacted by impoundments (drown out riffles), siltation of gravels (diffuse pollution), channel modification *i.e.* straightening (loss of fry refuge), debris removal and barriers to migration.

River Modification impacting habitat for Fishes – Rural Rivers.

The lower reaches of the relatively unmodified lower River Rees, South Island, New Zealand; complex meander and diverse flow patterns creating lentic and lotic habitat types - heterogeneous. *However: Floodplain cleared for grazing so river lacks complexity and diversity that woody material would bring.*

The lower reaches of the heavily modified River Witham, Lincolnshire, UK; floodbanks disconnecting river from floodplain, straight, over wide & over deep; resembling more stillwater than river, impounded, lacks a mix of lentic and lotic habitat types - homogenous.

River Modification more prevalent in the Urban Environment!
and the Urban Environment presents challenges to delivery!

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River Modification & the Urban Environment.

The Dour in Dover city centre; straightened affecting flow and thus habitat diversity, concrete banks lack marginal habitat which provides cover for fishes, numerous barriers (due to history of milling) fragment habitats and cause impoundments degrading habitats.

The River Wandle, South London; heavily urbanised catchment leading to flashy run-off and high peak flows, urban and road run-off affecting Water Quality, recent development converting properties to multiple flats has left a legacy of miss-connections, no functional floodplain, straight and concrete bankside, urban litter, history of milling left numerous barriers, small river and large population leads to poor dilution of STW effluent and any pollution (*e.g.* surface water drains go to river).

Urban: water quality issues – outfalls, CSOs, miss connections & overloaded and out-dated sewer network.

Urban: miss connections & road run-off.

Urban: water quality issues – pollution incidents and fish kills.

Urban: Litter issues.

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Urban: Habitat issues.

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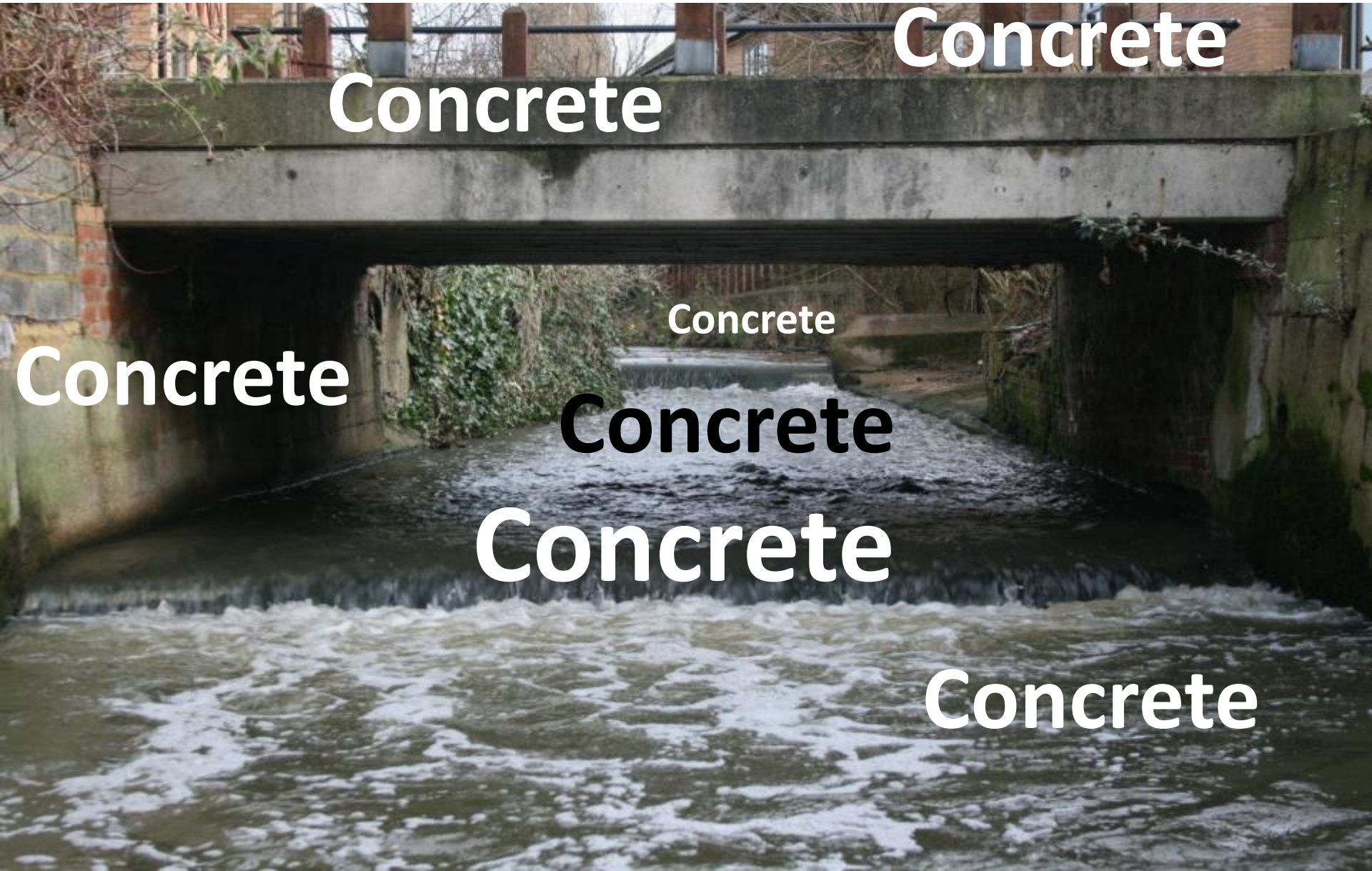

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The Solutions: Examples of actions / enhancement schemes designed to address specific problems.

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Example 1: River Clean ups, River Wandle 2001 – 2017.

Since 2009:

- cleared 15 km of river (repeated sections),
- 265 tonnes removed,
- 17,220 hours by volunteers clearing rubbish.

Helps local people value their river, and engages the community leading to education about wider river issues.

Helps the image of the river: A river full of litter is going to treated poorly.

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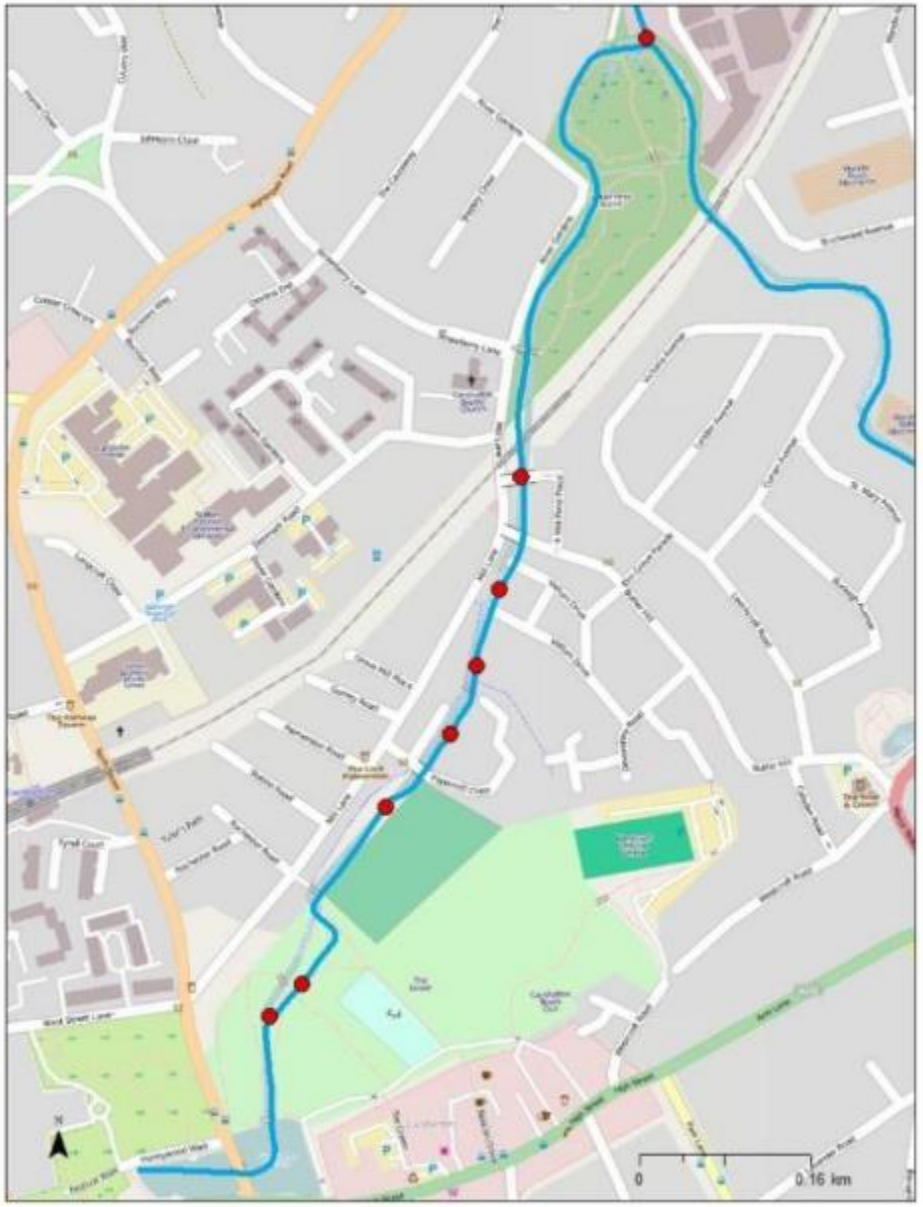
Example 2: Carshalton Arm, River Wandle 2010 – 2014.

- Multi-partner funded; CRF (DEFRA), EA, Thames Water, EU (Interreg IVA), Heritage Lottery Fund, Wild Trout Trust, probably others too! £363k
- Weir removal (7 low weirs).
- Hydrodynamic silt traps (Water quality, silt) addressing contaminated road run-off.
- Gravel introduction (habitat, geomorphology).
- Channel narrowing, marginal wetlands (habitat, hydromorphology).



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Butter Hill – During Removal.

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Butter Hill (looking upstream) – Before Removal. After Removal.

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Butter Hill 2 – Before Partial Removal

After Partial Removal.

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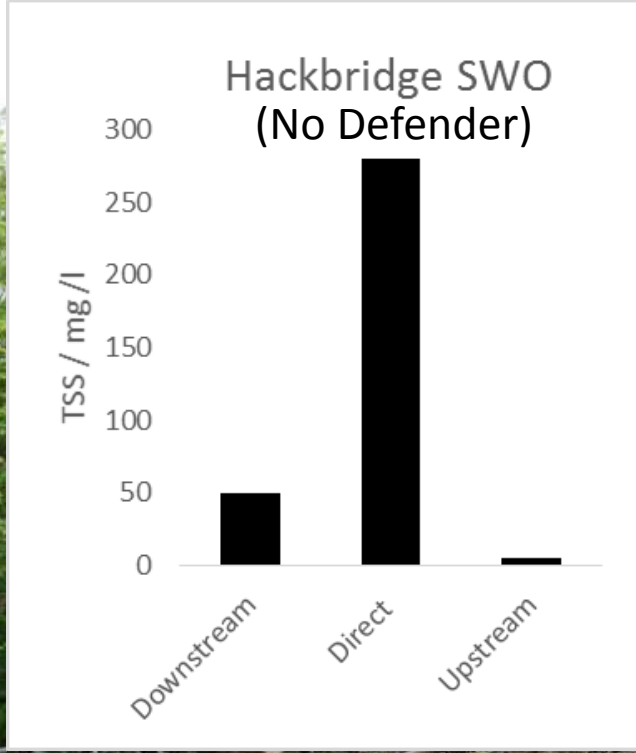
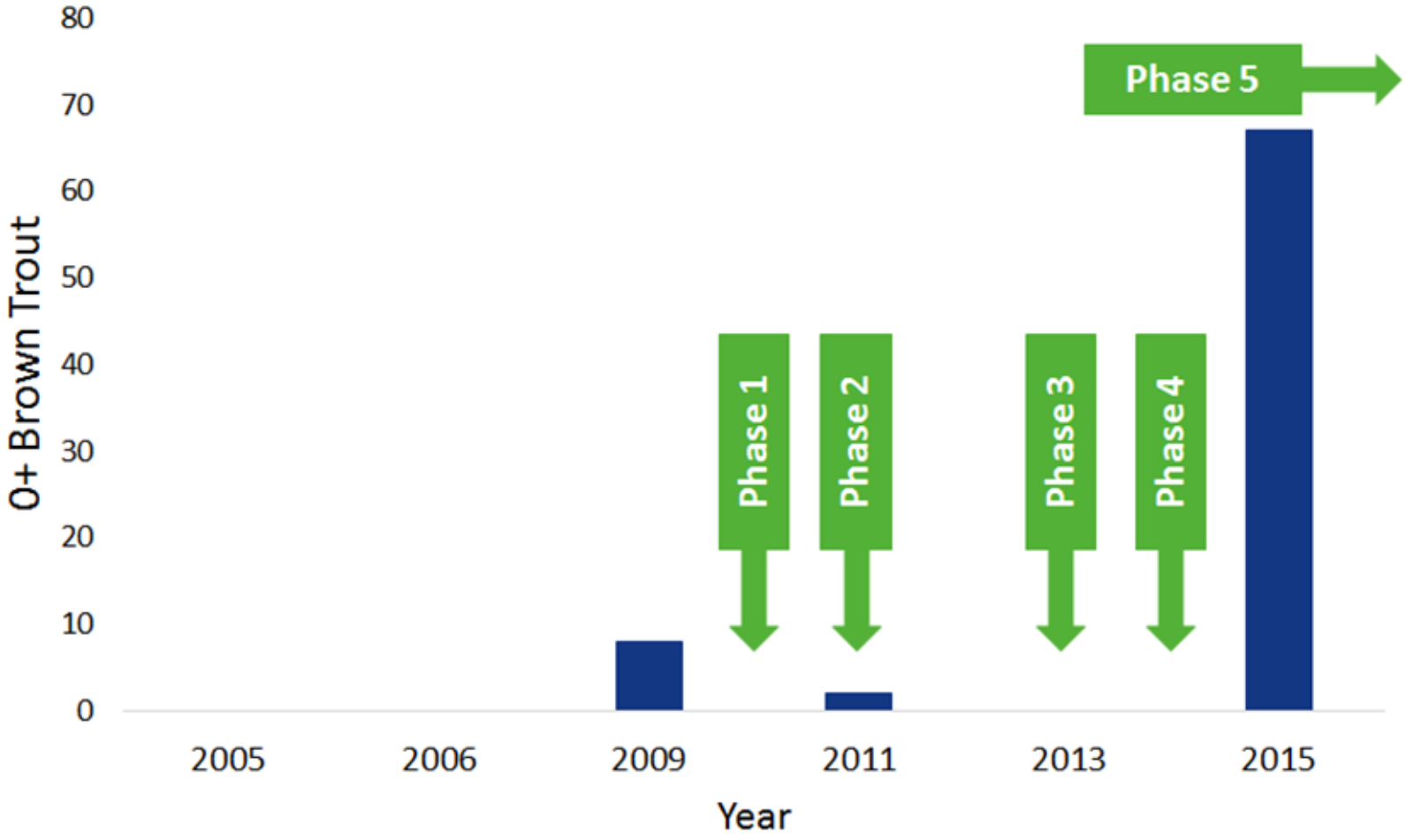


Real benefits!

EA Electrofishing Survey Results, Butterhill



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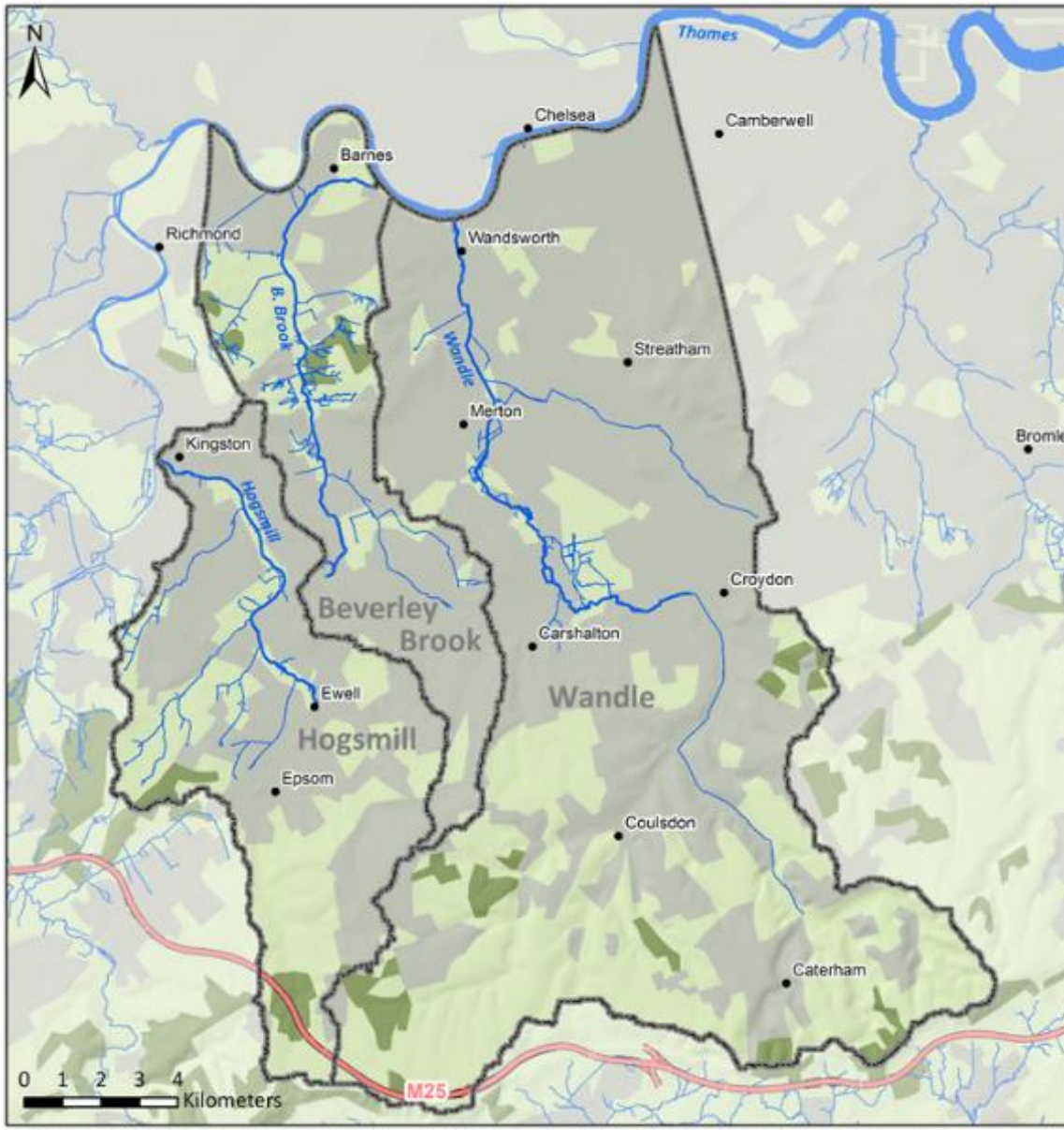
"*The Wandle Trust have absolutely transformed the fortunes of this previously degraded London chalkstream*" (WTT), which has lead to the Carshalton arm of the Wandle to be the first urban waterbody to be designated as 'Good Ecological Potential' under WFD, in the UK. And WINNER of UK River Prize 2016 (Urban).

Example 3: Hogsmill River Connectivity Project 2012 – 2015.

- Catchment Restoration Fund (CRF) project £350k
- Aim to make the entire Hogsmill River passable for all fish
- Fish passage addressed at 12 structures.
- 4 full weir removals.
- 2 rock ramp installations.
- 2 large pool passes
- 4 Baffle easements



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Removal 1 - Before.
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Removal 1 - After.

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Before
After


Rock pool pre-barrage & baffles - After.
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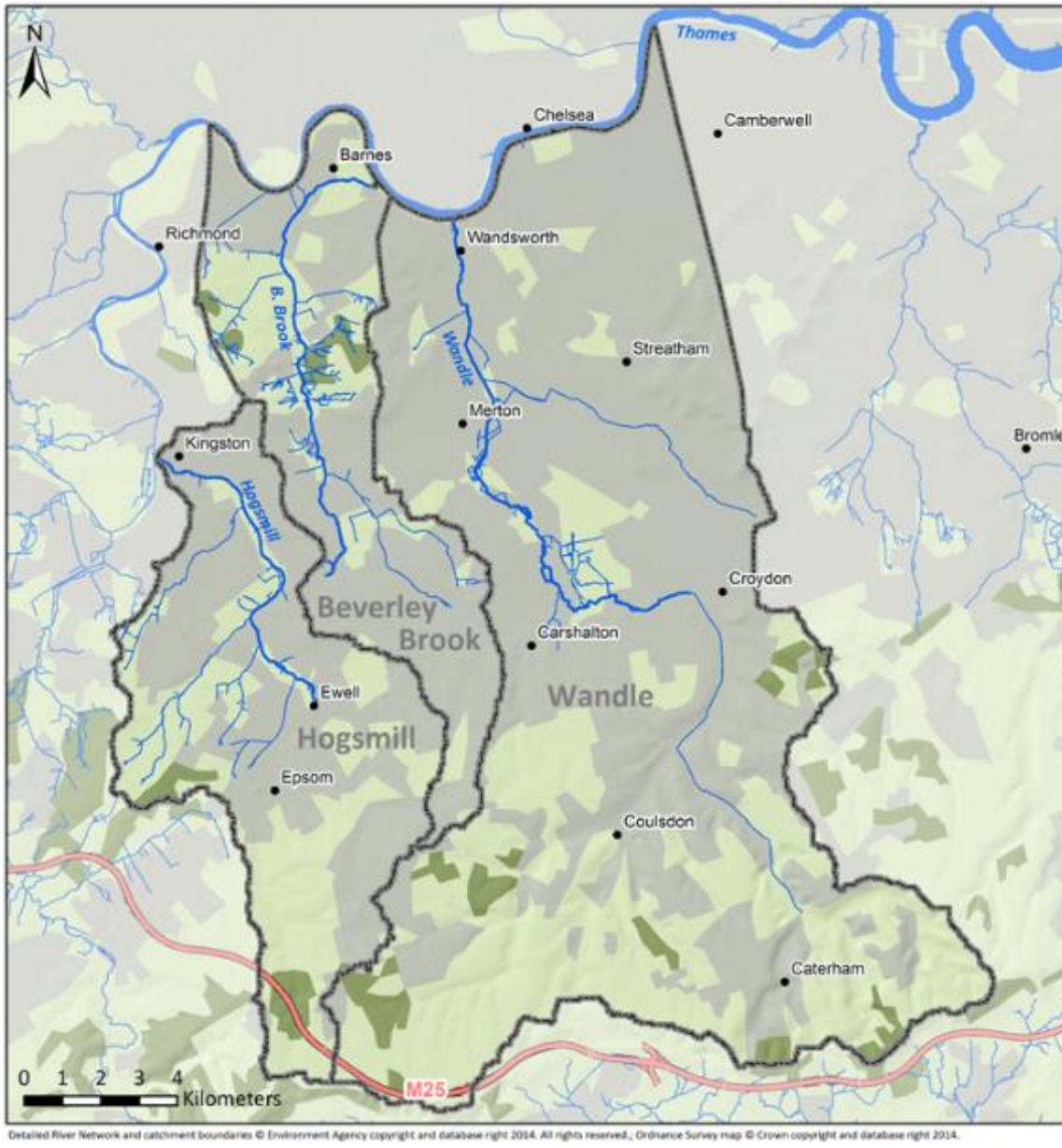
Kingston University weir 1 - Before.


Kingston University weir 1 – Rock ramp – After.

Example 4: Richmond Park, Beverley Brook, London Autumn 2015

- Multi-partner funded; CPAF (DEFRA), EA, Royal Parks, £140k
- Aim to improve habitat through a 600m reach of the Beverley Brook, which was straight, over wide and uniform.
- Urban greenspace presented an opportunity to re-meandered within old channel by creating berms and addition of LWM.
- Fencing to prevent poaching by dogs and deer.
- Fish refuge creation.
- Silt trap and wetland to protect from



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Before – homogenous, straight, shallow, open (no refuge habitat)
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Beverley Brook - Richmond Park
During - Berms, meanders and woody debris.
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Beverley Brook - Richmond Park
After – Plants and trees establishing.
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Beverley Brook - Richmond Park
After: Silt trap and Wetland to address urban run-off.
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Beverley Brook - Richmond Park
After: Silt trap and Wetland to address urban run-off.
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Thank you for your time.

Any questions?

FYI – Do you have ideas for low-cost habitat enhancement projects that could be delivered with volunteers during Loddon Rivers Week? 18th – 24th Sept ‘17.

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