Fisheries Habitat Restoration Project

Final Report 2020-2021

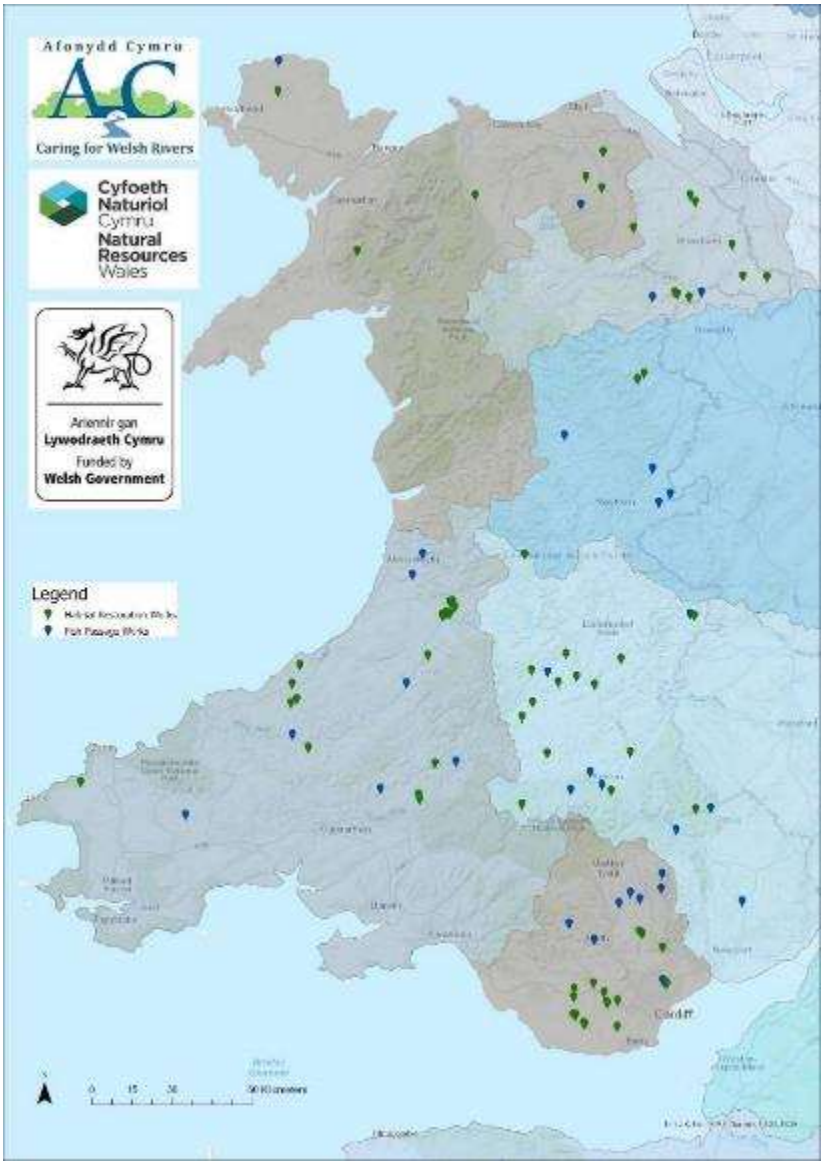
Afonydd Cymru AC Caring for Welsh Rivers

Ariennir gan Lywodraeth Cymru
Funded by Welsh Government

Cyfoeth Naturiol Cymru
Natural Resources Wales

Contents

All Fisheries Easement & Restoration Undertaken



Passage Habitat Works 2020-2021

Introduction

Natural Resources Wales commissioned Afonydd Cymru in 2020-21 to conduct investigations into the 23 principal salmonid rivers of Wales to assist in the preparation of comprehensive fisheries habitat restoration plans.

Salmon and Sea Trout numbers in Wales have declined dramatically in recent years[1].

- All salmon stocks are currently assessed as 'At Risk' or 'Probably at Risk' of failing to achieve the management target.
- Salmon as a feature of 4 N2K SAC sites are all classified as 'unfavourable'.
- Nationally and Internationally, salmon stocks considered to be "at lowest level ever" (NASCO and AST).
- 33 main sea trout rivers, 29 (88%) of stocks assessed as 'At Risk' or 'Probably at Risk' only 4 (12%) are 'Probably not at Risk'.
- We have seen a marked decline in stocks across Wales, sea trout in south Wales are giving most cause for concern.

This is a global phenomenon[2]. Freshwater biodiversity is declining at an accelerated pace when compared with overall biodiversity decline[3].

Welsh inland fisheries are more valuable to the GDP than coastal and marine fisheries combined[4]. Approximately 80% more barriers to fish migration and habitat connectivity were found than anticipated, as documented within the Amber barrier tracker project[5]. Indeed, walkover surveys are a much more coherent and evidence-based approach to identifying fisheries habitat issues than desktop reviews[6]. Rectifying connectivity and habitat concerns can have positive impacts on salmonid numbers[7] & [8].

All regional Rivers Trusts have surveyed their respective catchments. Walkover surveys were carried out within the Winter seasons of 2017 to 2021.

Catchments Surveyed 2017-18	**Catchments Surveyed 2018-19**	**Catchments Surveyed 2019-20**	**Catchments Surveyed 2020-21**
Teifi	Tywi	Western Cleddau	Wye
	Mawddach	Thaw	Usk (Phase 2)
	Clwyd	Usk	Dyfi
	Eastern Cleddau	Ogmore	Glaslyn
		Arth	Taf
		Aeron	Nevern
		Ystwyth	Loughor
		Wyre	Neath
		Rheidol	Tawe
		Leri	Upper Teifi
		Llyfni	Cadoxton
		Gwyfrai	Ebbw / Sirhowy
		Seiont	Rhymney

		Ogwen	Taff / Ely Severn (Phase 1) Dee Conwy Anglesey

The information gathered from surveys, including photographs, has been combined with known data to produce catchment specific reports. Afonydd Cymru have collated every issue pertaining to fisheries habitat and migration into one document, and onto GIS, which have been used to guide Welsh Government / Natural Resources Wales' fisheries restoration programme.

All opportunities for fisheries habitat improvements have been prioritised: Issues include barriers to fish migration, damaged / degraded riparian habitat including erosion, over / under shading, INNS, damage from grazing livestock, poaching, and detrimental adjacent land use problems, etc.

All actions needed to address identified issues, as well as being prioritised, have been approximately costed. The simple fact is that works identified within the 19 river catchments surveyed from 2017 to 2019, translate to an (approximate) £10,000,000.00 of inland fisheries habitat / connectivity restoration opportunities. There are another 18 catchment wide opportunities (surveyed throughout Winter 2020-21) to add to those already found.

This has resulted in Natural Resources Wales facilitating some significant funding to deliver improvements. The funding received by Afonydd Cymru in 2020 equaled £1,060,000.00. This is circa 10% of the money required to address the issues found, in the 50% of opportunities we have found and costed to date, on only our principal salmonid catchments.

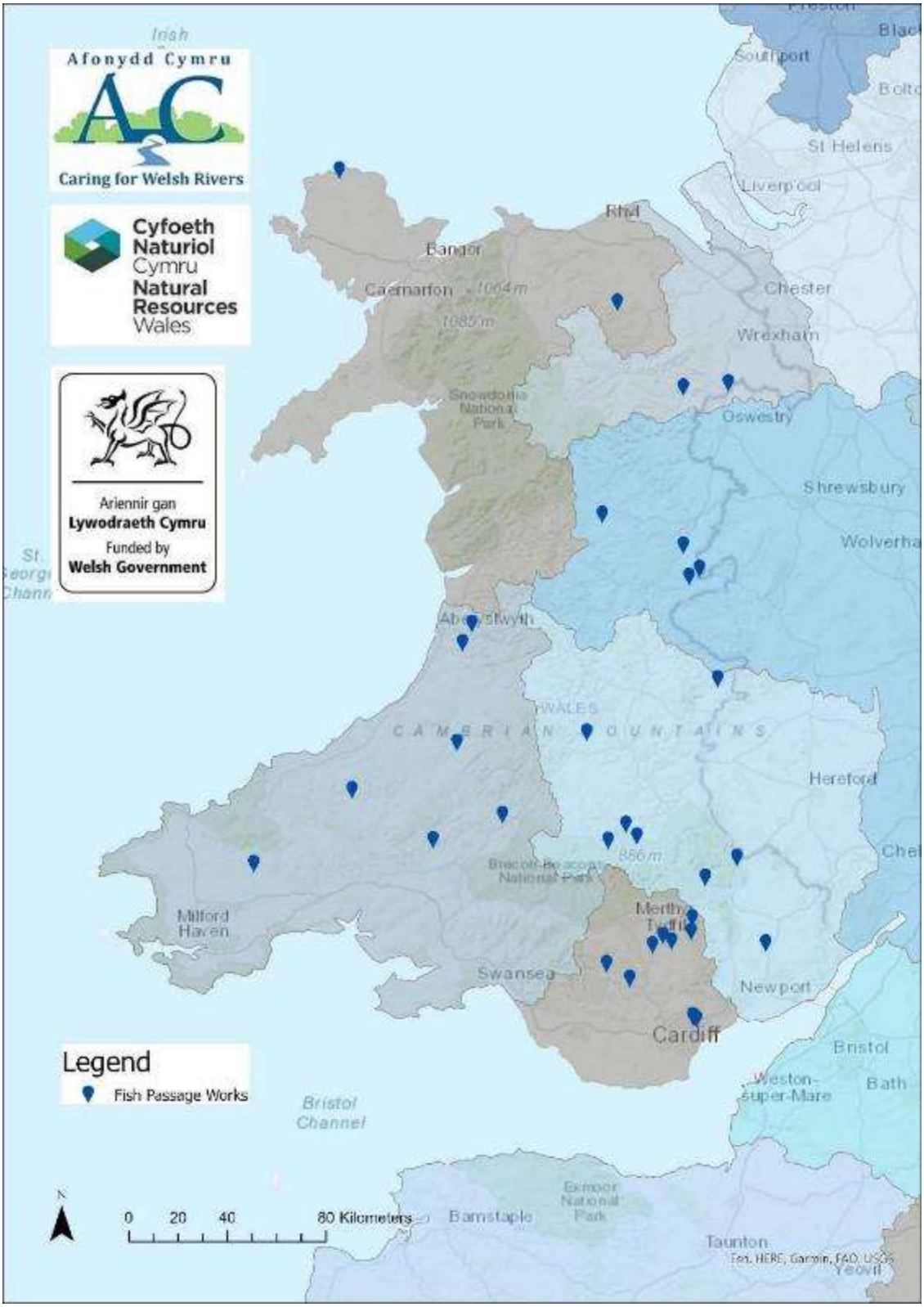
Throughout this project numerous 'green jobs' have been enabled: Regional Rivers Trusts have sought to increase their staff capacity; local contractors and consultants have been employed; and landowners throughout the country have been engaged.

It is anticipated therefore, following the successful delivery of fisheries habitat restoration works by regional Rivers Trusts throughout 2020-21, Welsh Government and Natural Resources Wales will continue and enhance their support for these works into the future.

This report is the full and final project report for works delivered throughout 2020-21 and should be used in conjunction with other project documents: Projects Tracker, Fisheries Habitat Reports and the overall spreadsheet of opportunities & approximate costs.

43x easement options initially prioritised and explored nationwide (out of 366 potential easement sites identified in the first tranches of surveys), potentially opening 477 km of passage.

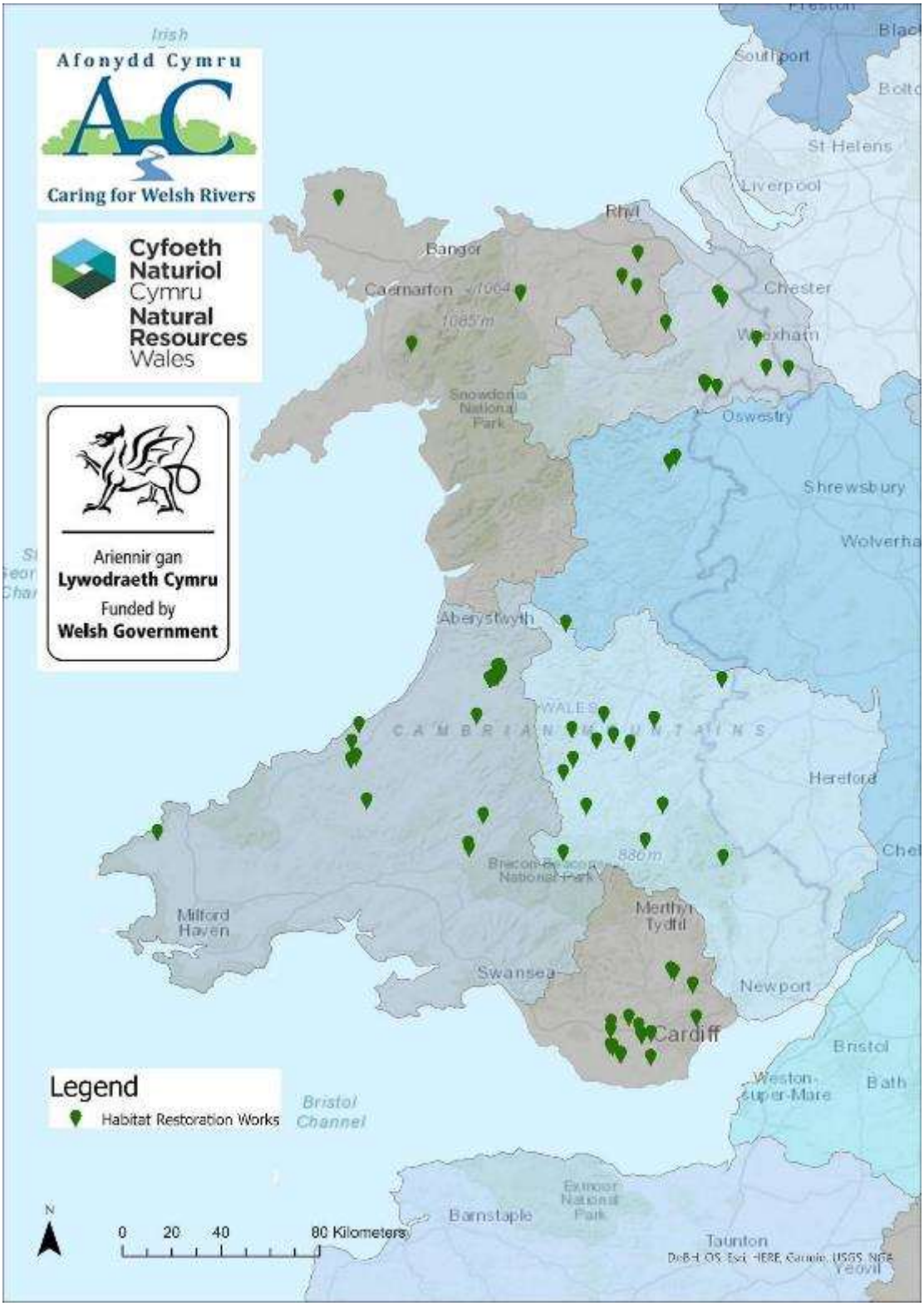
36x easement projects have been undertaken, enabling 452.4 km of fish passage.



Above: Figure showing fish passage easement works undertaken pan-Wales throughout 2020-21

92x habitat restoration projects initially prioritised and explored (out of 200 opportunities identified in the first tranches of surveys) potentially restoring 113km of riparian habitat.

72x habitat restoration projects are being undertaken, resulting in 101.67km of riparian restoration.



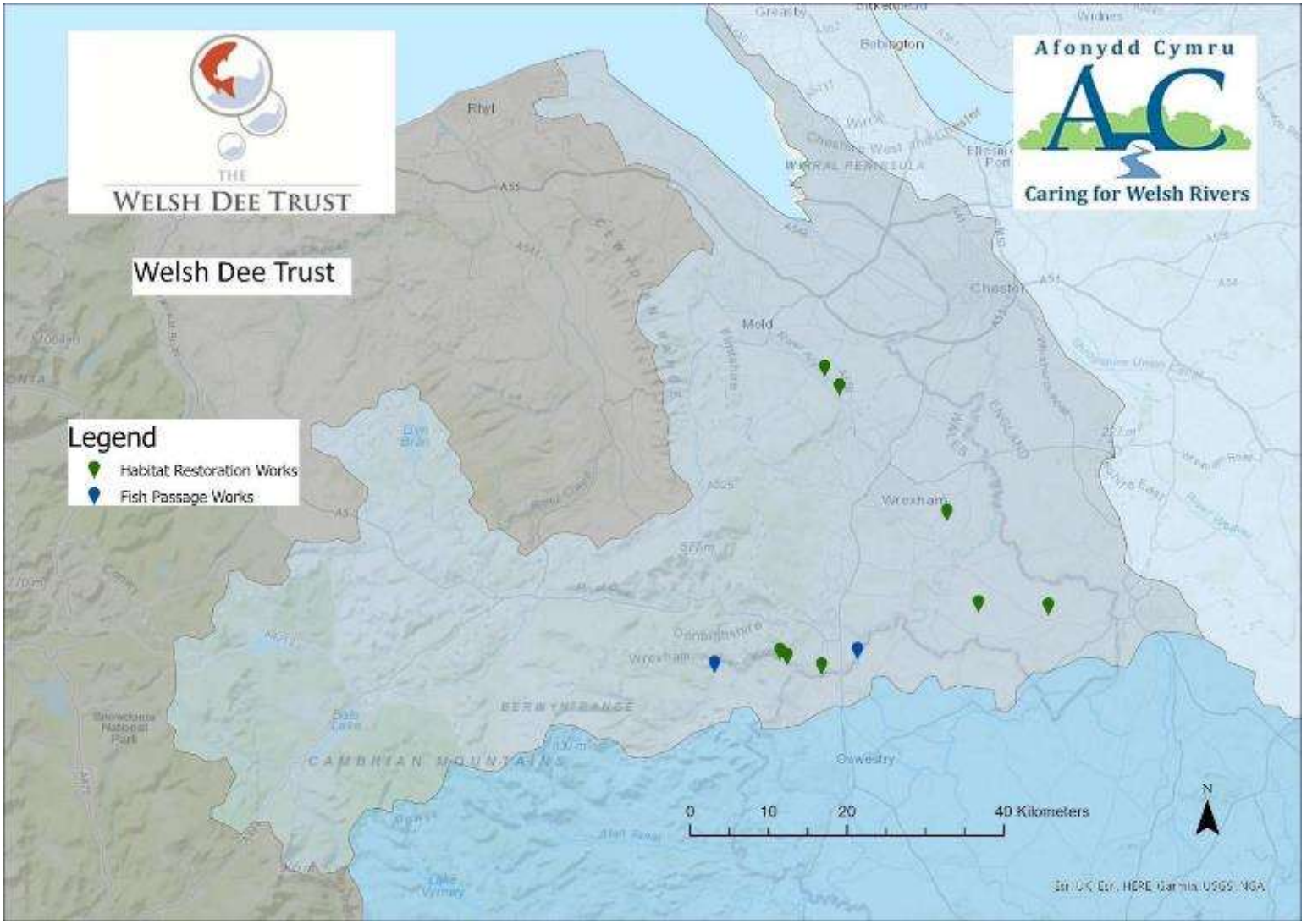
Above: Figure showing habitat restoration works undertaken pan-Wales throughout 2020-21

There has already been evidence of newly cut redds above easements where previous electrofishing surveys have proved fishless, and within recently restored habitat reaches.

Above: Redd on the Afon Concwest (NWRT) above easement works. No fish recorded above this point in previous surveys. Dec 20.

Below: Redd seen on Afon Bran (WUF) directly within habitat restoration site. Dec 20.

Welsh Dee Trust



WDT Allocation: £132,000

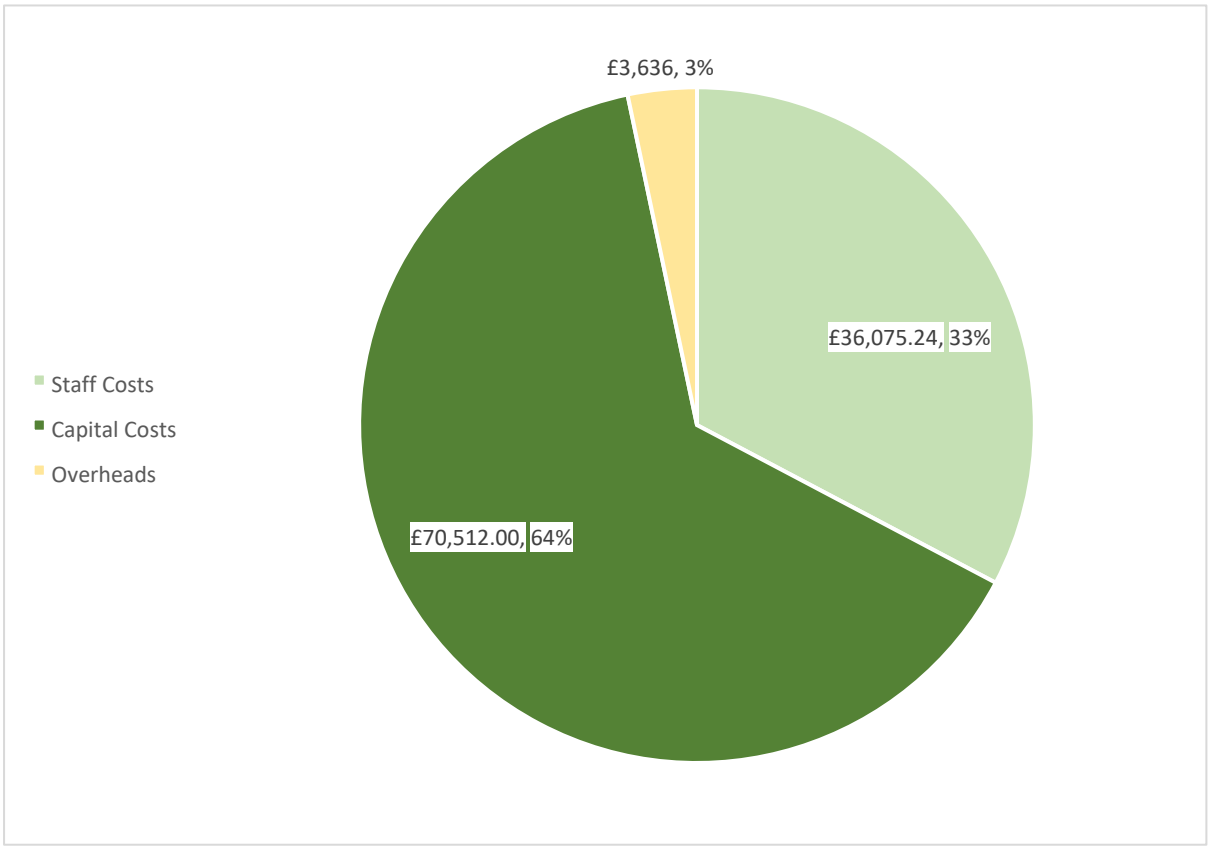
Total Spend: £139,335.15

Number of projects undertaken: 12 (10 x habitat restoration and 2 x easement works)

KM fish passage enabled: 6

KM Habitat restored: 14.5 Spend

breakdown:



Habitat Restoration	
Catchment	**Dyfrddwy (Ceiriog)**
NGR	SJ 25262 38238; SJ 25801 37857; SJ 28461 37080
Story	Severe bank erosion is occurring on sections of bank of the Ceiriog river due to a combination of poaching and flooding. We installed roughly 900m of stock fencing along the river at one sheep farm and two mixed livestock farms. We also planted ~ 70 native riparian tree species on the outside of the fence to create habitat variety and provide some stability on the bank. The total cost of the fencing was £7,120.80 and included rails and stock gates and trees were sourced free from the Woodland Trust. The fencing will provide some protection for the banks and hopefully allow vegetation to root and grow, undisturbed by livestock.

Photos Before	**Photos After**
	

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Fish Passage		
Catchment	**Dyfrddwy (Morlas Brook)**	
NGR	SJ 31230 38213	
Story	A large woody debris obstruction had formed on the Morlas Brook just upstream of the confluence with the Afon Ceiriog. The landowner approached the Trust through NRW with a request to inspect and remove the obstruction. WDT staff examined the blockage and found it to be almost a complete barrier to fish migration. As the work was in deep water, WDT employed the services of a local tree surgeon to remove the blockage. The contractor was also instructed to leave the larger cut off woody debris in the channel to create habitat diversity.	
Photos Before		**Photos After**

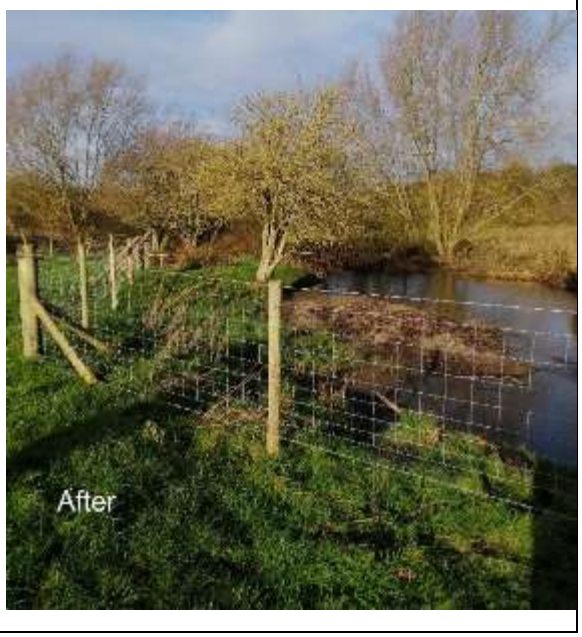
Fish Passage	
Catchment	**Dyfrddwy (Upper Mills Trout Farm/Box weir)**
NGR	SJ 20203 37337
Story	The old “box weir” at Upper Mills Trout Farm (no longer a fish farm) in Glyn Ceiriog has long been suspected as a partial barrier to fish migration and has had a major impact on the hydrology and morphology of the Ceiriog river both up and downstream of its location. WDT commissioned a specialist to conduct a feasibility study for fish passage at the barrier and develop an outline design for a non-technical

	option (easement). The consultant completed the outline design in time but in mid-January, Wales experience significant and prolonged rainfall and record high flood waters. During these floods, the weir was naturally breach in the centre of the structure, resulting in a large “notch” that is now ideal for fish passage. Discussions are ongoing with the landowner to ensure the status is maintained while also ensuring support for the landowner’s water abstraction scheme to keep his pond full.

Photos Before	**Photos After**
	

Habitat Restoration	
Catchment	**Dyfrddwy (Alyn)**
NGR	SJ 29033 59912
Story	WDT staff conducted a site visit to Stryt Isa Farm on Hartsheath Estate in Pontblydden in August 2020. During this visit it became clear that the river corridor and the watercourse were being heavily affected by the large dairy farm via constant poaching by cattle. This had led to extensive bank erosion, several messy drinking points and large amounts of slurry and silt runoff into the river. The right bank was also often bare of any tree cover resulting in a lack of stability and further erosion. The WDT engaged the Estate with a proposal for a habitat

	restoration scheme involving a lengthy piece of fencing, riparian tree planting, and the provision of water troughs. The latter would allow the Trust to completely fence off the river with no access for cattle and result in the best level of protection for the river corridor. The scheme was approved and delivered over the course of winter 2020/2021 with 2.1 km of river fenced off completely and 6 water troughs purchased. Roughly 60 trees were planted in the winter months.

Photos Before	**Photos After**
	
	

Habitat Restoration	
Catchment	**Dyfrddwy (Gresford)**
NGR	SJ 30149 58459

Story	The WDT was approached by Wrexham and District Angling Club with a request for some fencing materials to repair a stretch of fencing on the Alyn that had degraded over time. The RRH team purchased 200mof fencing along with posts, strainers and barbed wire and delivered it to the site. The angling club members conducted a repair and replacement of the old fence in the winter of 2020.

Habitat Restoration	
Catchment	**Dyfrddwy (Stryt Isa)**
NGR	SJ 29033 59912
Story	This was part two of the Stryt Isa scheme and allowed the Trust to fence off the full length of the Alyn on the farm. A separate contract was required for this job as it had to wait until the field were dry and digging and pipe laying could take place (at the request of the farmer). These pipes would then be connected to the water troughs for the spring of 2021. The scheme was completed in March 2021 with ~1200m of trenches dug and pipes laid to connect to the 6 water troughs.

Habitat Restoration		
Catchment	**Dyfrddwy (Clywedog)**	
NGR	SJ 38267 48730	
Story	The Trust were approached by the owner and farmer at Erlas Hall on the Clywedog river downstream of Wrexham Industrial Estate. RRH team staff conducted a site visit in November 2020 and recorded significant bankside erosion and poaching, and minimal tree cover present on the left bank. A lack of formalised drinking area meant that livestock were accessing the water along the entire bank. With landowner approval, 400m of fencing and a railed drinking bay were installed. Approval was gained to set the fence back a bit further from the river channel in places to allow room for riparian tree planting in Autumn 2021.	
Photos Before		**Photos After**

Habitat Restoration	
Catchment	**Dyfrddwy (Emral Brook)**
NGR	SJ 40608 41702
Story	The Trust were contacted by a landowner and cattle farmer on the Emral Brook in September 2020. A site visit by RRH team staff thereafter revealed an

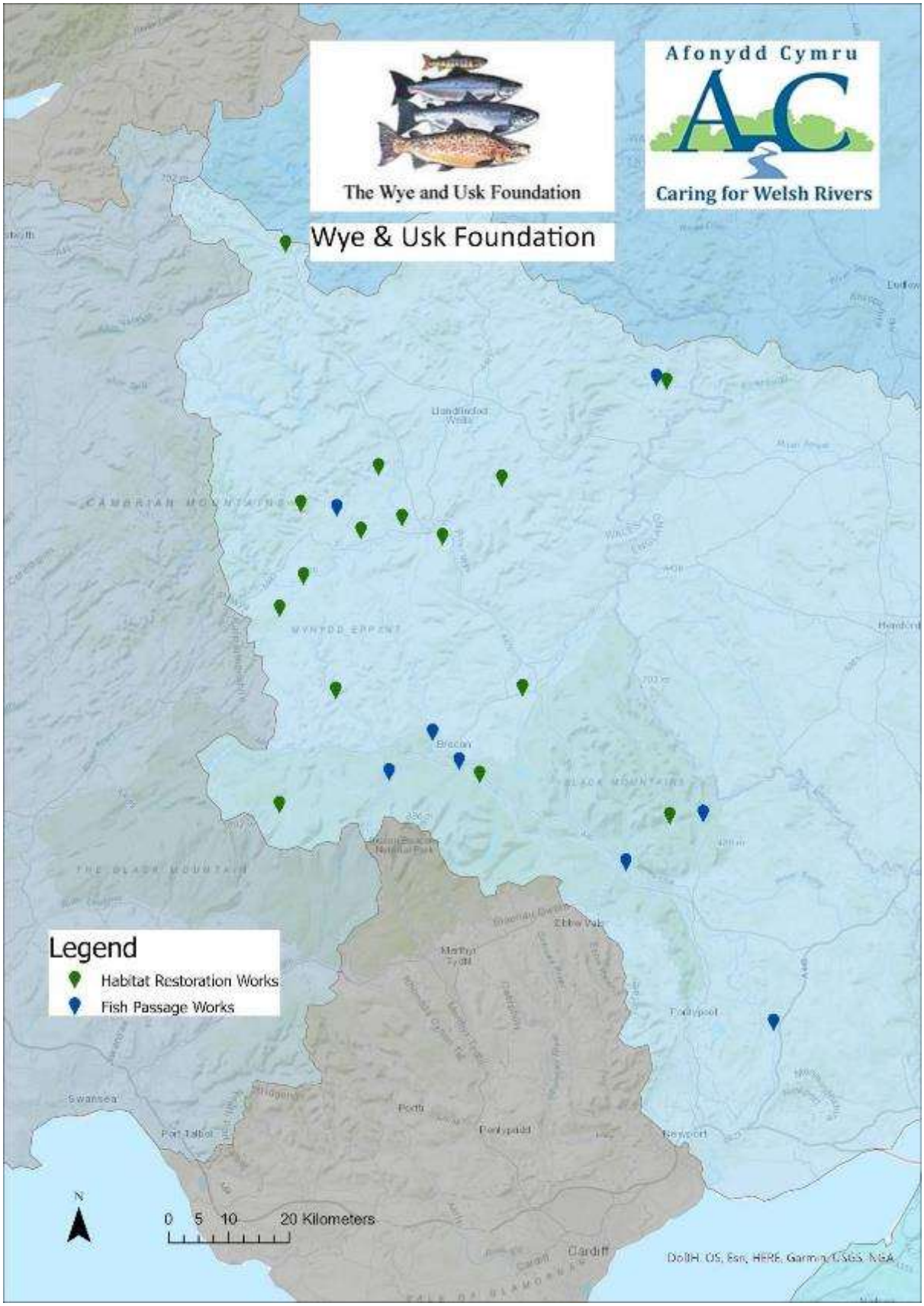
	extensive amount of degradation to the main channel of the brook, as well as several smaller tributaries flowing through the farm. Given the scale of impacts and options for interventions the team initially pursued an extensive habitat restoration scheme, but the landowner could not be convinced of the long-term value of this approach. It was eventually agreed that most of the fencing would take place, followed by willow and alder planting in the wetter areas that were fenced off completely from livestock. At the completion of the scheme, nearly 2 km of fencing had been installed, and ~50 trees planted.

Photos Before	**Photos After**
	
	

Habitat Restoration

Catchment	**Dyfrddwy (Wych Brook)**
NGR	SJ 45988 41431
Story	This scheme involved fencing off a small piece of seasonally flooded rough grassland and riparian woodland along the Wych Brook, a tributary of the main Worthenbury. The Trust's RRH team examined the site in the summer of 2020 and suggested to the landowner that it would be of great benefit to fence of the grassland to create a wide corridor. The landowner was very supportive of conservation efforts and agreed to this, on the condition that he had access to graze livestock lightly and was provided with a trough to water the cattle and sheep. The scheme was completed in the winter of Autumn of 2020 with 1.5km of fencing installed and a water trough purchased.

Photos Before	**Photos After**
	
	



WUF Allocation: £232,800

Total Spend: £226,874

Number of projects undertaken: 23 (16x habitat restoration and 7x easement works)

KM fish passage enabled: 128.9

KM Habitat restored: 32.65

Fish Passage	
Project	Brecon Honddu weir
Action	Visited by LMA, Need Geomorph survey for FRAP. Geomorph survey purchased. Owners consents in place.
NGR	SO 04090 29720
Cost	Geomorph £8730

Story	Remove all redundant concrete from channel except structure on Left bank
	
Lessons learned	Geomorph needed regardless as Main river

Fish Passage	
Project	Libanus weir, Tarell
NGR	SN 99550 25760
Cost	Geomorph £8042.5
Action	Visited by LMA, Need Geomorph survey for FRAP. Geomorph survey ordered. Owners consents in place.

Story	Owner has had all the details and meeting with LMA. Left to digest and discuss with family as to what they would like to do. Full removal or lower crest. Will discuss further after survey report. But likelihood of leaving for now.
	
Lessons learned	Geomorph needed regardless as Main river

Fish Passage	
Project	Stanton weir
NGR	SO 31710 20950
Cost	Geomorph circa £7k estimate
Action	Visited by SE, Need Geomorph survey for FRAP.
Story	**NRW taking on responsibility.**
Fish Passage	
Project	Lower Usk Croys
NGR	ST 38690 99450
Cost	Geomorph circa £7k estimate
Action	Visited by SE and fishing club 6/12/2020, Need Geomorph survey for FRAP.
Story	**No further action for now as plans have changed**

Fish Passage	
Project	Brecon Honddu Llethergynuen weir
NGR	SO 03730 32870
Cost	Geomorph £7105
Action	Visited by LMA, Need Geomorph survey for FRAP. Geomorph survey ordered. Owners consents in place.
Story	Owner has had all the details and meeting with LMA. Left to digest, Will discuss further after survey report.

Lessons learned	Geomorph needed regardless as Main river

Fish Passage	
Project	Dolly green weir
NGR	SO 27500 65560

Action	Completed
Story	Planned removal but owner not convinced. Loose rocks removed from Glacis and notch cut in lower block stone

Photos Before	**Photos After**
 	  SMS's last action on a weir

Lessons learned	Geomorph needed regardless as Main river

Habitat Restoration	
Project	Caerfanell Gravel
NGR	SO 10710 20850
Action	**Awaiting DCWW consent**

Story	Extraction and introduction consents in place. DCWW stopped proceedings at the final hour. Awaiting further input from DCWW as to progress

Photos Before

Gravel source above reser

Denuded stream below dam

Site visit with DCWW

Gravel source

Otter spraint

Lessons learned	Don't think anything is agreed until it's been signed off by manager at top!

Habitat Restoration	
Project	Crai Gravel
NGR	SN 88220 22650
Action	Still sourcing potential donor sites

Story	Intro site surveyed by LMA and SE. liaising with NRW for source gravel, possible ex shoaling material from historic problem sites. Biosecurity protocol being discussed.

Photos Before	**Photos After**
	

Lessons learned	It's difficult to find a suitable gravel source. Usually the limiting factor.

Fish Passage	
Project	Grwyne Debris dam
NGR	SO 23720 16100
Action	Completed
Story	Very large debris dam. Electro fishing showed no salmon above. Moyrah Gall (NRW) consented. Took team 4 days to clear

Lessons learned	Remove before similar before it becomes such a problem and needs total removal. If dealt with earlier less erosion would occur and some CWD could be arranged and left in situ.

Fish Passage	
Project	Cynrig Debris Dam

NGR	SO 06760 26740
Action	Completed
Story	Very large debris dam. Electro fishing showed reduced salmon above. Moyrah Gall (NRW) consented. Took team 2 days to clear

Photos Before	**Photos After**
  	  
Lessons learned	Remove before similar before it becomes such a problem and needs total removal. If dealt with earlier less erosion would occur and some CWD could be arranged and left in situ.

Habitat Restoration	
River	Usk, Bran
NGR	SN 94260 34210
Action	In action

Story	New fence 2337m s/b D/B river enhanced 1743m 7 watergates plus field gates S28 consent 4 owners. Crossed PRoW, gates and consent needed

Photos Before	**Photos After**
	
	




Habitat Restoration	
River	Wye,Llynfi Dulas
NGR	SO 13390 34110
Action	Completed
Story	Repair existing fence- 1400m s/b D/B enhanced – 1000m Existing S28 in place 1 owner
Photos Before	**Photos After**
	
Lessons learned	Floods damage fences and they need constant maintenance

Habitat Restoration	
River	Wye South Dulas, Gareth davies

NGR	SN 91200 45950
Action	Completed
Story	Repair/replace fence 550m s/b. D/B river enhanced 1900m. 7 Watergates. Existing S28 consent. 2 owners

Photos Before	**Photos After**
	
	
	

Lessons learned	Watergates need constant maintenance

Habitat Restoration	
River	Wye South Dulas Iain Davies
NGR	SN 88690 42710

Action	Consented. **Too much to complete in SAF1 continue in SAF**2
Story	Repair/replace fence 1100 m s/b. D/B river enhanced 1840m. 7 Watergates. Existing S28 consent.1 owner.

Photos Before

Habitat Restoration	
River	Wye South Dulas Gary Davies
NGR	SN 88690 42710
Action	Consented
Story	New fence 640m s/b. D/B river enhanced436m. 2 Watergates. S28 consent. 1 owner

Photos Before **Photos After**




Habitat Restoration	
River	Wye ,Garth Dulas
NGR	SN 94760 52830
Cost	
Action	Completed
Story	Blocked Watergate. Existing S28 consent 1 owner who provided Hymac

Photos Before	**Photos After**
	To be taken
Lessons learned	Watergates need constant checking and maintenance

Habitat Restoration	
River	Usk, Menasgin

NGR	SO 08840 25330
Action	Completed
Story	Repair/replace fence 560m s/b. D/B river enhanced 1789m. 0 Watergates. Existing S28 consent. 2 owners

Photos Before	**Photos After**
	

Habitat Restoration	
River	Wye,Lugg, Dolly Green
NGR	SO 28600 65100
Action	Completed
Story	Repair/replace fence 1700m s/b. D/B river enhanced 1719m. 2 Watergates. Existing S28 consent. 2 owners

Photos Before	**Photos After**
	

Habitat Restoration	
River	Wye Chwefru
NGR	SO 01400 51690
Action	Completed

Story	Repair/replace fence 900m s/b. D/B river enhanced 2132m. 2 Watergates. Existing S28 consent. 3 owners.

Photos Before	**Photos After**
	

Habitat Restoration	
River	Usk, Grwyne
NGR	SO 28280 20790
Action	Consented
Story	Repair/replace 100m fence. D/B river enhanced 500m. 3 Watergates. Existing S28 consent. 1 owner

Photos Before	**Photos After**
	




Habitat Restoration	
River	Wye Edw
NGR	SO 11640 55500
Action	Completed
Story	Repair/replace fence 650m s/b. D/B river enhanced 1215m. 4 Watergates. Existing S28 consent. 3 owners

Photos Before	Photos After
	

Habitat Restoration	
River	Wye Hirnant

NGR	SN 99100 56900
Action	Consented. **Too much to complete in SAF1 continue in SAF2**
Story	Repair/replace fence 700m s/b. D/B river enhanced 1021m. 2 Watergates. Existing S28 consent. 1 owner

Habitat Restoration	
River	Wye Duhonw
NGR	SO 05490 49670
Action	Consented

Story	Repair/replace fence 1680m s/b. D/B river enhanced 987m. 5 Watergates. Existing S28 consent. 2 owners

Photos Before	**Photos After**
	
	
	

Habitat Restoration	
River	Wye Cammarch

NGR	SN 91090 53330
Action	Consented. **Too much to complete in SAF1 continue in SAF2**
Story	Repair/replace fence 2321m s/b. D/B river enhanced 1450m, 2 Watergates. Existing S28 consent. 1 owner

Photos Before	**Photos**

Habitat Restoration	
River	Wye Hafrenna
NGR	SN 97170 50470
Action	Consented. **Too much to complete in SAF1,continue in SAF2**
Story	Repair/replace fence 50m s/b. D/B river enhanced 1377m. 11 Watergates plus field gates. Existing S28 consent. 1 owner

Habitat Restoration	
River	Wye Upper
NGR	SN 90130 79720
Action	S28 NRW
Story	New fence 761m s/b. D/B river enhanced 760m. 3 field gates. S28 consent. 1 owner

Photos Before	**Photos After**
	

Afonydd Cymru

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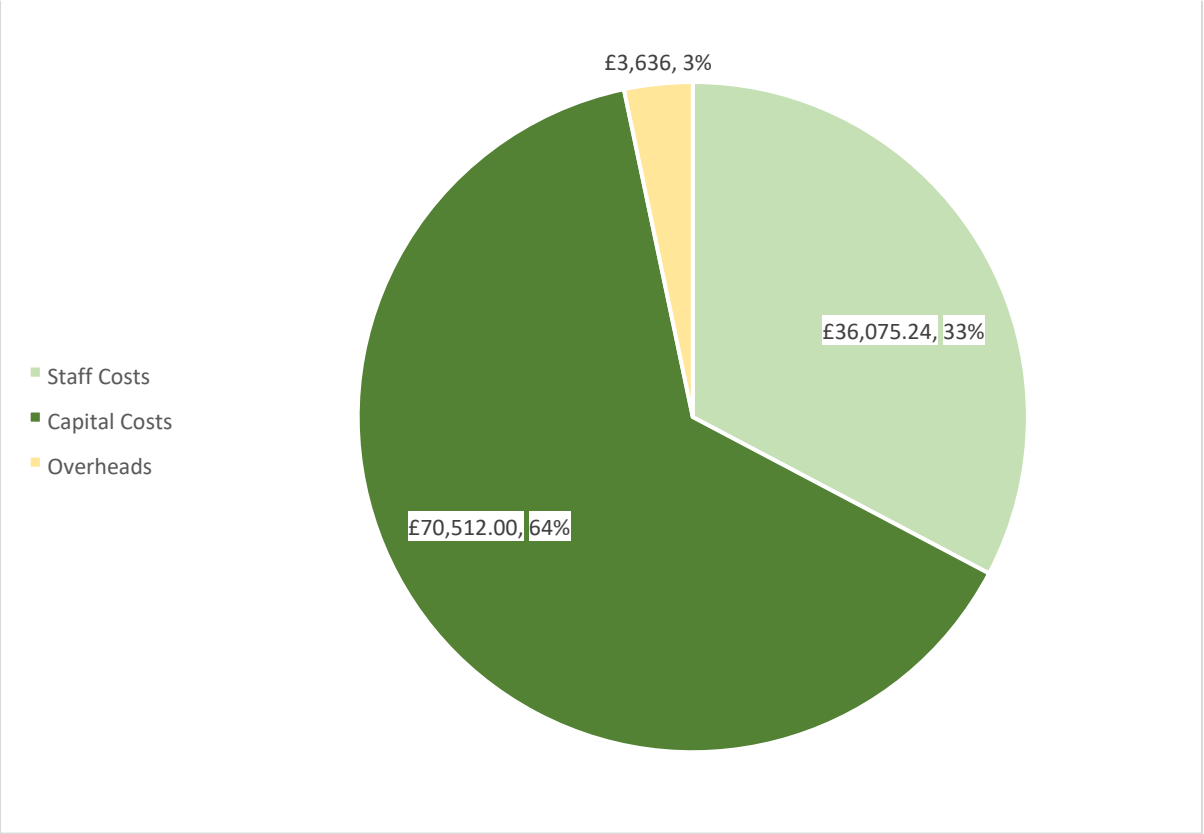
AC Allocation: £64,000

Total Spend: £64,707

Number of projects undertaken: 5x habitat restoration.

KM Habitat restored: 5.75

Spend breakdown:



Habitat Restoration	
Project	Upper Western Cleddau Tregidreg Farm
Action	Closing of Stock Access & Provision of Alternative Water
NGR	SM 87286 31045 to SM 86155 30805 & SM 86155 30805 to SM 86267 31451
Cost	£25,385.00 (+VAT)
Story	Beef and arable farm. Open access for stock throughout upper Western Cleddau and smaller stream draining to sea in opposite direction. All ditches, streams and watercourses now fenced. 6x cattle troughs provided throughout fields, including piping, moling and field preparation.. Marshy area and smaller stream fenced.. Upper Western Cleddau 

Photos Before	Photos After
 Unfenced LHB. Cattle allowed free access into river throughout. Gates across watercourse at most downstream point which is collecting debris.	

Landowner (Martin) keen to fence this field if alternative water offered. Access to mains in top left corner of field. Split into 4 fields for mob grazing when cattle outside.

LHB Fenced (3 string). 3 x designated drinking bays. Landowner keen to close off if alternative water option offered. Access to mains. Otter sanctuary on RHB of this field.

LHB unfrenced. Steep bank with good vegetation

cover but stock have free access throughout river and riparian zone. Landowner happy to fence back from the watercourse to encompass the vegetation (5m back from W Cledd). RHB is an otter sanctuary.

Habitat Restoration

Project	Afon Ceri Cefnmaesmwr Farm
Action	Closing of Stock Access & Well Cleaning (& Piping) for the Provision of Alternative Water.
NGR	SN3260546340
Cost	£11,000
Story	Open stock access throughout ditches and watercourse. Farm identified within the AC/DC project, therefore, has a supporting AC report. Well cleaning and piping to alternative water provisions provided. Stock access to watercourses and ditches removed.

Photos Before

Photos After

Habitat Restoration

Project	Afon Ceri FIeld near to Brongest Fishery & Llwyn Cadfor Farm.
Action	Fencing and Provision of Alternative Water
NGR	SN3217145526 & SN3395342694
Cost	£5,000
Story	Open stock access in field adjoining fishery, trampled ditches. Fence field and offer alternative water option. Llwyn Cadfor Farm Fence and alternative water for stock.

Photos Before

Photos After

Habitat Restoration	
Project	Afon Ceri Blaenafon Farm

Action	Fencing and Provision of Alternative Water
NGR	SN3716048160
Cost	£5,000
Story	Open stock access throughout ditches and watercourse. Farm identified within the AC/DC project, therefore, has a supporting AC report.

Photos Before

Photos After

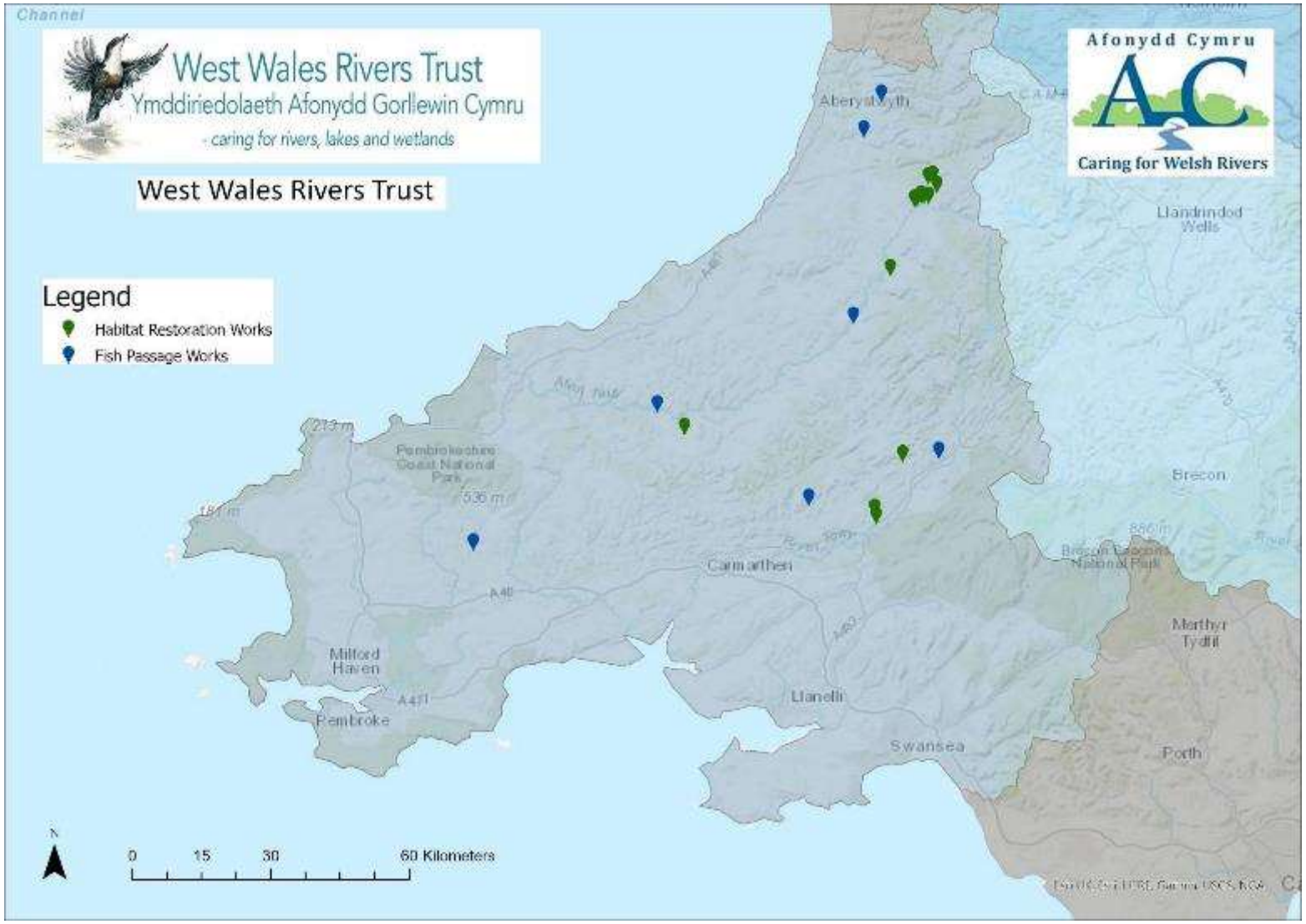
Habitat Restoration	
Project	Afon Ceri Tyr Rhos Farm

Action	Fencing and Provision of Alternative Water
NGR	SN3727651279
Cost	£4,455
Story	Double fence ditch / stream running through field & alternative water

Photos Before

Photos After

West Wales Rivers Trust:



WWRT Allocation: £192,540

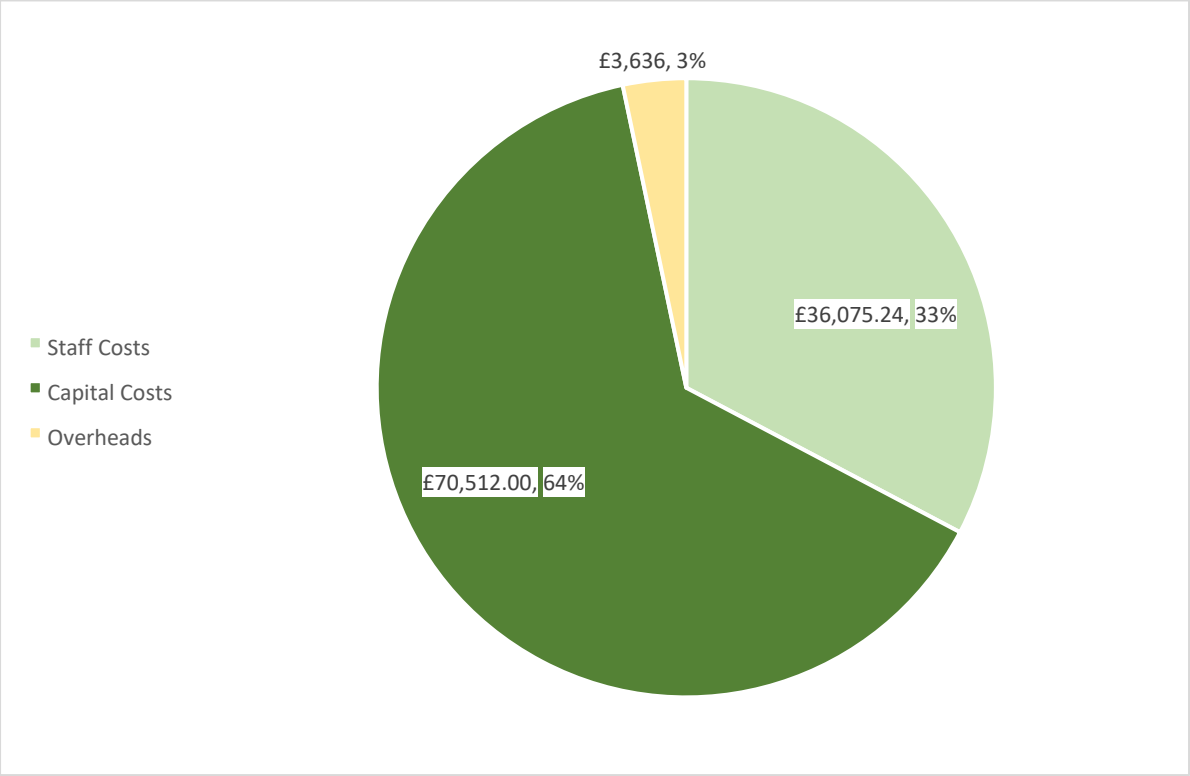
Total Spend: £194,339.82

Number of projects undertaken: 25 (18x habitat restoration, 7x fish passage easement).

KM Fish passage eased: 114

KM Habitat restored: 11.2

Spend breakdown:



Fish Passage	
Project	Vicars Mill, Eastern Cleddau
NGR	SN 10623 22547
Cost	£38,844.50
Action	Demolition of 70% of the weir & removal of old fish pass.
Story	Removal of the structure will improve access to more than 20kms of upstream fish habitat and restore the natural river geomorphology. Work to dismantle the weir and fish pass began on 1 September 2020 and was carried out by an experienced local contractor who completed the task in just three days.

Photos Before	**Photos After**
	

Lessons learned	Historic (?) structures must be researched fully, and an open dialogue held with archaeological trust / all interested parties.

Fish Passage	
Project	Tywi, Sannan.
NGR	SN 55716 27026
Cost	£12,362
Action	Rocky ramp installation
Story	Easement of a concrete Irish road bridge comprising of three culverts approx. 8m in length with a perched sill.

Photos Before	Photos After
	

Fish Passage	
Project	Afon Clywedog, Teifi
NGR	SN 63044 51090
Cost	£12,199.00
Action	Larinier style fish pass
Story	Easement of a substantial concrete weir (sill) used to support a road bridge leading to a private house. There was no pool immediately below the weir and only a shallow one some distance from it, limiting the potential for fish to traverse the head height.

Photos Before	Photos After
	

Fish Passage	
Project	Teifi at Henllan gorge
NGR	SN 35859 40105
Cost	£1,800.00
Action	Removal of a log blockage from the narrow low flow channel
Story	The location of the tree blockage had been impeding fish passage at low flows for a couple of years and previously dead fish had been found on the surrounding rocks (see photo below) where they had jumped but failed to clear the obstruction.

Photos Before	Photos After
	

Fish Passage

Project	River Mynys
NGR	SN 73285 32824
Cost	£411.80
Action	Removal of large fallen Oak tree causing a blockage to fish passage and installation of 23m of stock fencing

Photos Before

Photos After

Habitat Restoration	
Project	Rhosmaen Dulais Brynwgan
NGR	SN 64466 25426
Cost	£20,183.00 (over 4x projects)
Action	2.3km of fencing. 2 x solar powered pumps and troughs resulting in total livestock exclusion
Story	Part of a wider programme of fencing delivered on the downstream end of the Rhosmaen Dulais. Confidence built with landowners locally likely to result in future fencing opportunities along this river. This river was chosen to pair with ongoing work by the Carmarthenshire Fisheries Federation (CFF) to clear plastic blockages.

Photos Before	Photos After
	

Habitat Restoration		
Project	Teifi main stem	
NGR	SN72781 66717 to SN72675 66720	
Cost	£1,275.00	
Action	0.125km fencing	
Story	On RHB	
Photos Before		**Photos After**

Habitat Restoration	
Project	Rhosmaen Dulais confluence (Clos Glas)
Action	Fence off 1 x drinking bay and install solar powered pump & trough - others to follow based on owner evaluation of this one. Maintenance of approximately 160m of existing fencing.
NGR	SN 39412 36980 to SN 64703 23989
Cost	£1194.00

Story	Repairing fencing previously installed over 15 years ago. Good buffer strip in place which is worth protecting by fixing existing fencing.

Photos Before	**Photos after**
 	Photos to follow.

Lessons learned:

Schemes this low down in the river must be completed in the Summer as there are few delivery windows in Winter due to high rainfall.

Habitat Restoration	
Project	**River Marlais in the Tywi catchment**
NGR	SN 39412 36982 to SN68437 32523
Cost	£2118.00
Action	Installation of 270m of stock fencing and one 5ft gate for access.
Story	Postponed due to high water levels & waterlogged / saturated ground. Ready to go and will be completed when ground conditions allow.

Photos Before	Photos After
	

Habitat Restoration	
Project	**Tywi Dolau Gleision on the Rhosmaen Dulais**
NGR	SN 64488 25421
Action	The biggest phase of this project, the replacement of existing failing fencing over approx. 0.76km, has been completed and was reported on in October. However, there is a small (90m) section of fencing still to be completed in spring 2021.
Story	This section is on a river bend with eroding banks and so in December 2020 WWRT staff will be planting willows to stabilise the section prior to the fencing being installed.

Photo before	Photo after
	

Habitat Restoration	
Project	**Teifi River Meurig**
NGR	SN 72011 68225 to SN 71823 67784
Action	This is a scheme in the upper reaches of the river Meurig. The scheme involves the fencing of several fields, and the installation of water gates and solar powered pumps and troughs. The fencing will extend for approx. 1km along both banks.
Story	Previous NRW scheme. Posts replaced where necessary and small fallen section. Double bank - Maintenance repairing old scheme. All strainers gone and three quarters of posts rotted needed replacing. Plus new swing gates at ends of scheme that were also damaged.

Photos Before	**Photos After**
 	

Habitat Restoration	
Project	**Teifi Nant Carfan**
NGR	**SN 6746157284**

Action	This scheme extends for approx. 300m and is along a currently unfenced section of the Nant Carfan with unrestricted cattle access to the river. There is an ash tree that needs to be removed and as alternative drinking is already present the installation of the fence will achieve total stock exclusion.
Story	This scheme extends for approx. 300m and is along a currently unfenced section of the Nant Carfan with unrestricted cattle access to the river. There is an ash tree that needs to be removed and as alternative drinking is already present the installation of the fence will achieve total stock exclusion.

Photos Before	**Photos After**
	 

Habitat Restoration

Project	Meurig - Tanyrhydiau Farm
NGR	SN 73724 69618 to SN72801 69308
Cost	£13,116.00
Action	1.1km of fencing
Story	

Photos Before	**Photos After**
	
	

Habitat Restoration	
Project	Teifi main stem
NGR	SN70912 66418 to SN70793 66434
Cost	£975
Action	0.125km
Story	3 strand barb, previously unfenced

Photos Before	**Photos After**
	 

Habitat Restoration	
Project	Teifi main stem
NGR	SN72146 66783 to SN71705 66664
Cost	£7,626.00
Action	0.875km
Story	New double bank fencing scheme. High tensile sheep netting with one strand top barb. Plus 3 gates.

Photos Before	**Photos After**
	

Habitat Restoration	
Project	Teifi main stem
NGR	SN70895 66393 to SN70405 65896
Cost	£5,760.00
Action	1.1km
Story	Maintenance / Replacement of 200-300 posts

Photos Before	**Photos After**

Habitat Restoration	
Project	Meurig
NGR	SN71787 66903 to SN71831 66754
Cost	£1,548.00
Action	0.16km
Story	New fencing – single bank

Photos Before	**Photos After**
	 

Habitat Restoration	
Project	Meurig
NGR	SN72801 69308 to SN72757 68750
Cost	£7,915.20
Action	0.8km
Story	LHB. Replacement fencing. Combination of barb and sheep netting. Three 12ft gates and one footpath gate.

Photos Before	**Photos After**
	 

Habitat Restoration		
Project	Teifi main stem	
NGR	SN71247 66403 to SN71015 66335	
Cost	£3,492.00	
Action	250m of fencing	
Story	New fencing on previously unfenced LHB	
Photos Before		**Photos After**

Habitat Restoration	
Project	Siedi
NGR	SN 39412 36976 to SN 39176 37326
Cost	£7,134.00
Action	530m stock fencing.

Story	3x5ft steel gates. 4 river crossings with swing gates. Installed solar water pump and drinking trough.

Photos Before	**Photos After**
	  

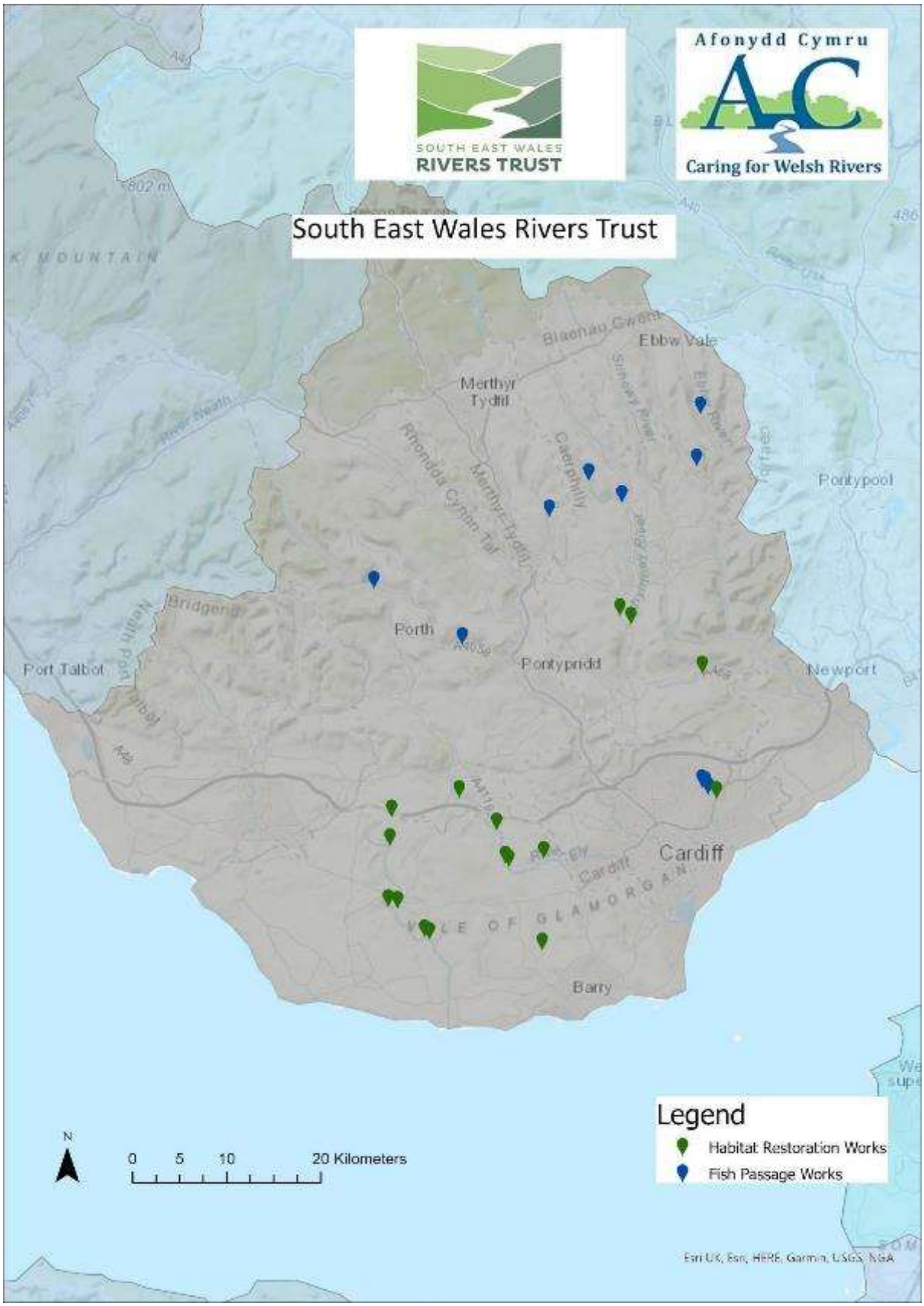
Habitat Restoration	
Project	Meurig - WWRT/HR_2020_26
NGR	SN 39412 36977 to SN 71837 66757
Cost	£1,587.00

Action	0.165km	
Story	On LHB. High tensile, 1 strand barb and sheep wire	
Photos Before		**Photos After**

Habitat Restoration		
Project	Cothi - WWRT/HR_2020_27	
NGR	SN 39412 36983 to SN 71837 66757	
Cost	£4,350.00	
Action	0.72km	
Story	Repairs to existing fencing on LHB	
Photos Before		**Photos After**

Habitat Restoration		
Project	**5 woody debris/plastic blockage removals**	
NGR	SN 64431 75725, SN 66890 80395 & SN 73285 32824	
Cost	£300	
Action		
Story		
Photos Before		**Photos After**

South East Wales Rivers Trust



SEWRT Allocation: £183,360

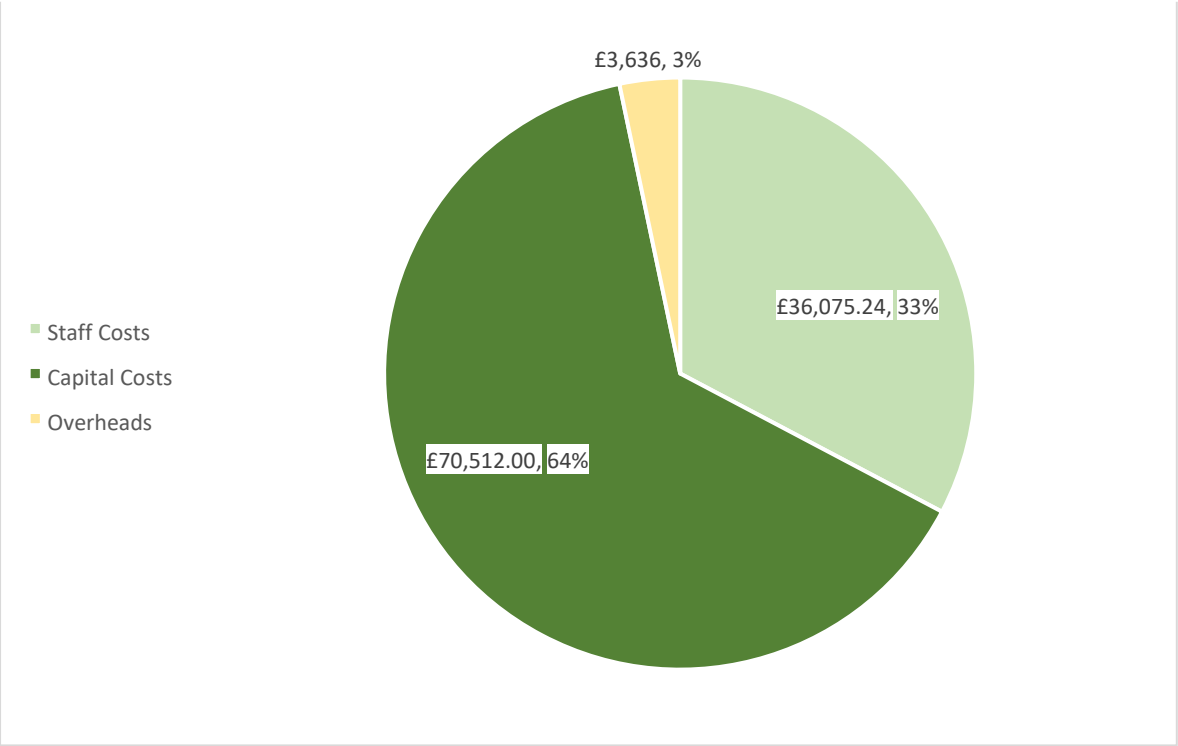
Total Spend: £164,888.09

Number of projects undertaken: 26 (15x habitat restoration, 11x fish passage easement).

KM Fish passage eased: 155

KM Habitat restored: 15.75

Spend breakdown:



Fish Passage /

Project	Taff Bargoed climbing centre weirs
NGR	ST 10140 99620
Cost	£1,716
Action	Notch a series of 5 small concrete double weirs spread out along approximately 300metres of a canalised section of the river
Story	The site is now the Welsh international climbing centre but was formerly the offices of the Taff Merthyr Colliery. Through this section the river was constrained within a concrete channel to prevent erosion into the mine site. Over time the concrete bed of the channel has been covered by river gravel washed down and to all intents and purposes is a natural bed. However, the 5 double step weirs remained as a series of obstructions. These have been notched using petrol disc cutters and kango hammers.

Lessons learned Long term good relations with the landowner facilitate quick project works

Fish Passage	
Project	Ystrad Rhondda railway bridge
NGR	SS 98535 94920
Cost	£1,996
Action	Fix 4 baffles to left hand channel of the slab floor under the railway bridge
Story	This project was carried out in conjunction with Trehafod Project and the details are similar. We had a long-protracted discussion with Railtrack on such things as liability, Insurance. We had to ask the Contractor to take out extra insurance for this and the work at Trehafod for extra cover asked for by Railtrack

by concentrating the water flow we are enabling

Fish Passage	
Project	Trehafod railway bridge
NGR	ST 04300 91115
Cost	£5,556
Action	Fixing 10 timber baffles to the concrete floor of the Trehafod railway bridge
Story	Barrier to fish passage at some flows. There were three distinct channels forming the barrier Recommended by Natural Resources Wales to install wooden baffles in channel on the left-hand side facing upstream. At this time the flows were even between two channels. Storm Dennis changed all this by making the left channel the main one. This would have resulted in any baffles being subjected to any debris large or small coming down the river that could have damaged them. It was noticed that on the flows when migratory fish would be expected to run the centre channel offered a better solution. It was decided to go with this option

Before photos

After Photos

Lessons Learned: The Structure was in the ownership of Rail Track the surrounding land and access was Rhondda Cynon Taff. The Council did not give us any problems with permissions granted. Permissions from Railtrack took more than two years in total. The major flooding that we all suffered during those two years may have had a bearing as to why Railtrack took so long.

Fish Passage	
Project	Trehafod railway bridge
NGR	ST 04300 91115
Cost	

Action	Fixing 10 timber baffles to the concrete floor of the Trehafod railway bridge
Story	Trehafod railway bridge like many in the Valleys has a large anti scour pad cast on the riverbed between the abutments to prevent undercutting of the bridge this pad extends some 15 metres along the stream and is full width. Originally the plan had been to locate the baffles in the Left channel, lower picture. However, following the floods of February 2020 and the resultant regrading of the bed the centre channel offered a better solution. This decision was also based on previous experience. Contractors fixed the baffles under network rail site supervision

The picture (top left) shows the channel before work stared with a small flow. The shoal above was mostly removed and the two pictures below show how it works on high water. Our experience shows that the thing with baffles is that trees can break them free. The outer channel on the left. Will be the one that any trees will be pushed towards as the stronger flow.

Fish Passage	
Project	Mountain Ash weir

NGR	ST 05140 98765
Cost	£ XXX removal of damaged baffles
Action	Downstream blockstone placement to flood out weir step
Story	Mountain Ash weir is the remains of a railway bridge scour pad it is approx. 35 metres in length with a 1m downstream step, the scour pad had baffles fixed to it previously. However, during the extreme flooding of February 2020 these were extensively damaged. Later in the spring the remaining damaged baffles, anchor straps and bolts were removed to prevent H&S risks to river users. Later we were informed that RCTCBC would be carrying out significant repairs to riverbank revetments in the area both above and below the weir using block stones including the use of a block stone roadway to get down to the weir to carry out repairs in the downstream section. Following discussions with the council engineer it was agreed that some of the block stone roadway below the weir would be used to create a prebarrage once works downstream were completed. This was carried out a zero cost to SEWRT except for the officer time involved in the discussions and site monitoring.
	
Lessons learned	Having good working relationships with local authority engineers allows for joint working at minimum cost to SEWRT: This was one we had identified as previous work had failed during the February Floods. So much damage was caused to the river retaining walls that other agencies, Council, Railway, had to go in and make good. Using our knowledge and contacts we have now achieved a satisfactory position by working with all parties involved and giving advice how it should be left. We will revisit in the spring to assess.

Fish Passage	
Project	Nant Glandulais
NGR	ST 20227 81309

Cost	£4,436 plus materials £2,727
Action	Installation of Baffles
Story	The Nant Glandulais runs into the River Rhymney where the A48 crosses the river. A culvert runs under the Hawthorns Footbridge which is causing a barrier to fish migrating upstream. The culvert creates shallow and fast water which makes it difficult for fish to pass through it. The installation of baffles both upstream and downstream of the culvert aims to slow the water, increasing the water's depth and creating diverse flows. This will be done by installing timber baffles which will be held into place by steel brackets which will be screwed into the concrete. We plan The installation of one timber baffle on the upstream side and two on the downstream side. Each baffle will be made up of two 1.4m long timbers alongside each other with a gap of 30cm in between them. These will each be held down by two steel brackets.

Lessons learned	Working on small flashy brooks is not easy especially when wet winters are part of the problem. 

Habitat Restoration	
Project	Fencing at The Bryn, Pendoylan
Action	To fence the River Ely
NGR	ST 06636 77735 to ST 06719 77126
Cost	£5,400 (plus VAT)

Story	The Bryn is a stock farm on the outskirts of Pendoylan. The land adjacent to the river has over time eroded away, up to 10m has been lost over the last 15 years, this includes the original fence which is in the river. There is also some poaching from cattle present. The objective was to erect a fence to prevent stock entering the river and to let some vegetation grow to help stabilise the banks. We would hope to revisit this area in the spring to see if we can limit the erosion by putting in some strategic deflected that have worked for us in the past

Photos Before

Photos After

	
Lessons learned	We used a combination of different types of fencing, depending on where the river flooded. In areas which flooding was significant we used three strands of barb to allow water and debris to flow through. In areas which the flooding risk was lower we used stock netting and barb. This combination of fencing has helped to reduce the pressure on the fence which flooding can cause and therefore protecting the site and fence for the future.

Habitat Restoration	
Project	Llandough House (Thaw)
NGR	SS 9975 7365 to SS 9957 7315
Cost	£6,000: Cost reduced to allow for Natural Resources Wales creating a wetland area. Remainder of work will be determined when this is completed
Action	Fencing to improve Habitat
Story	Land at Llandough House is farmed by cattle during most months of the year. The land is particularly heavy which has resulted in significant cattle poaching and damage through the main gateway off the road. The owner has been very interested in our work and has given us a large section of his riverbank to be fenced off. See Pics. The land is rented out with a large field on one side with a cattle drink at the main road end. This is causing problems that we will need to resolve but the river has washed away a large portion of land making a cattle drink difficult to make. The remainder of the work will now be phase two

Lessons learned	The landowner has been particularly helpful. There is much more that can be done to make this area into a more natural river corridor.

Habitat Restoration	
Project	Work on the Waycock
NGR	ST 09275 70898 to ST 09543 70187
Cost	£10,000 (plus VAT)
Action	To stock fence the Waycock and remove to obstructions
Story	Old Wallace Farm is a stock farm near Duffryn. They farm both sides of the Waycock with sheep and cattle using the river to get to the other side. There is some erosion and cattle poaching on both sides of the bank and the farm is prone to flooding during the winter months. The stock fencing will help to mitigate the erosion and poaching. Designated cattle drinking bay/crossing point will be installed to mitigate to issues. There is a large oak tree and a willow tree that will be removed as a potential river obstruction. The trees are being removed this week and fenced before the end of Dec 2020 weather permitting.

Photos Before	**Photos After**
	Currently in progress

Lessons learned	The farmer was approached after March and therefore no tree of hedges could be cut back until September due to the legislation regarding nesting birds.

Habitat Restoration	
Project	Flemingston Moor
NGR	ST 02121 70398 to ST 02992 69713
Cost	£7,500 (plus VAT)
Action	Fence the River Thaw
Story	To carrying on the fencing work, which was previously done by the Rivers Trust, this is to complete the additional 1200m of fencing. The moor will have stock fencing (wire and net) and a solar pump for cattle drinking.

Photos Before	**Photos After**
	

Lessons learned	Some of the fencing which has been done previously has been damaged from the flooding and as part of his contract with the River's Trust he has agreed to repair the fencing when he was down there erecting the additional. Therefore, it is essential to get all landowners to sign the contracts to ensure that work is protected.

Habitat Restoration	
Project	Cwmnofydd Farm – River Rhymney
NGR	ST 1948 8850 to ST 2012 8893
Cost	£7,253.50
Action	Fencing the river bank to prevent animal poaching
Story	Cwmnofydd is a dairy farm located on the River Rhymney. The land is predominately used for grazing young cattle and for silage. The farmer wanted stock fencing and barbed wire just in case they wanted to put sheep on in the future. There is an extremely popular footpath along the field as well as fishing rights therefore it was decided to leave a minimum of 3 meters between the river and the fence, to ensure there is enough room. There is approximately 20m of additional fence, which is located next to the river, this is because there is significant erosion at this point. The fence will allow for the regrowth to help stabilize the bank and prevent further erosion and to help protect the public. There are two 5ft gates located either end of the fence to allow access for walkers and fishers. No machinery access point is needed, the farmer can use a hedge trimmer over the fence if maintenance is needed. There is also an existing water trough in the field so no livestock will have access to the river at any point.

Photos Before	Photos After
	 

Lessons learned	There is a footpath which runs along the river, the owner has spoken to the council to gain permission and we will leave a minimum of 3 meters to comply with all the rules and regulations.

Habitat Restoration	
Project	Duffryn Bach Farm
NGR	ST 05794 79172 to ST 06638 78184
Cost	£6,500 plus VAT
Action	Fence the River Ely
Story	Duffryn Bach Farm is a stock farm near Pendoylan. The proposed site stretches three fields which have no fencing. There is some stock erosion and poaching, which the fence will help to protect. This farm will join up with The Bryn Farm to ensure that a large stretch will be protected from stock damage. The fence should be completed by Dec 2020.

Photos Before	Photos After
 	
	
Lessons learned	The farm is particularly wet and therefore we have been restricted to when we will be able to enter the land with tractors and trucks.

Habitat Restoration	
Project	Land at Llanblethin
Action	To fence the River Thaw

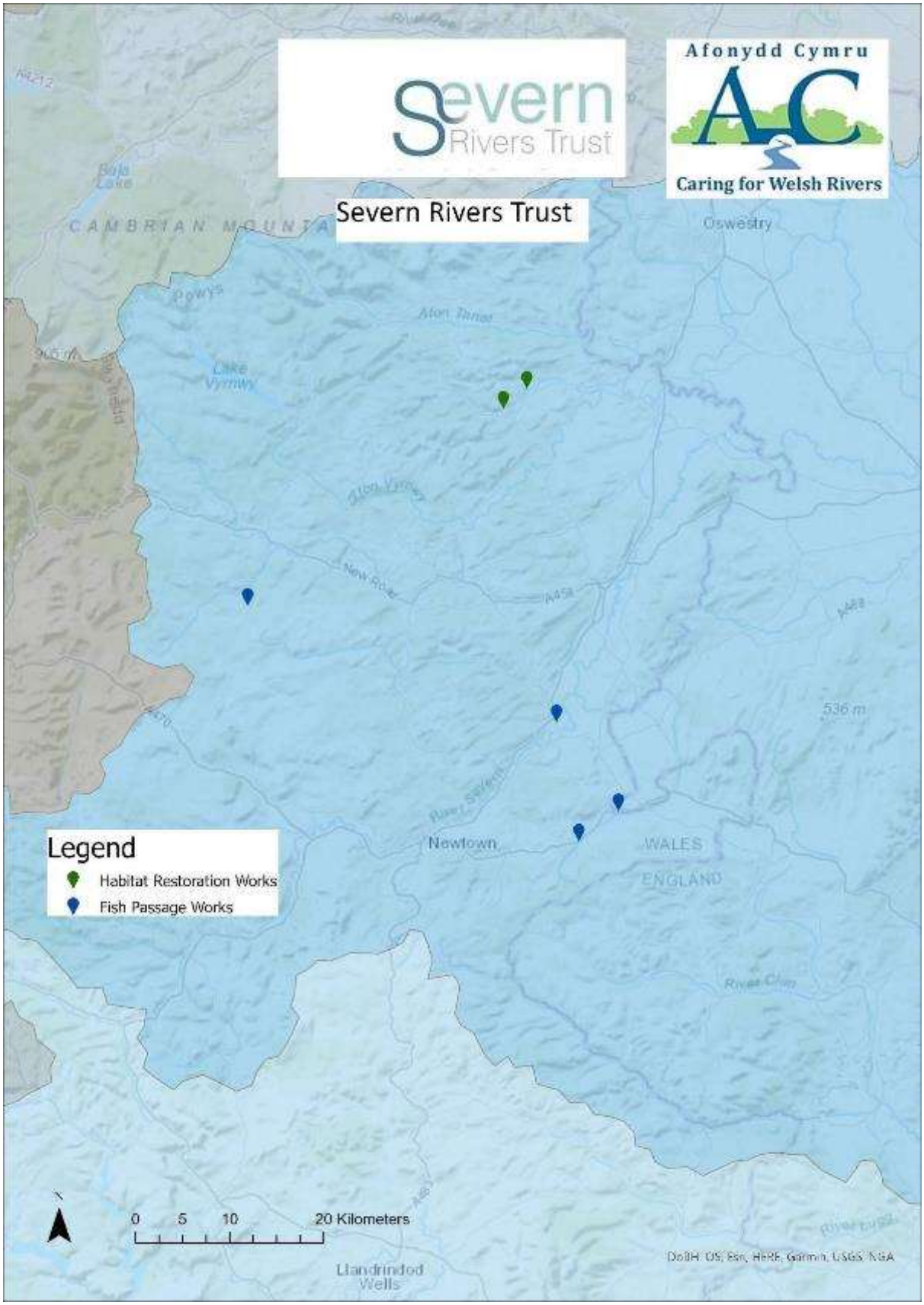
NGR	SS 99148 73856 to SS 99728 73585
Cost	£7,900 plus VAT
Story	The Lady has taken on the land from her father and she rents the fields out to a local farmer who grazing it with sheep and cattle. There is an existing old fencing which has been damaged through flooding and in parts is in the river due to bank erosion.

Photos Before

Photos After

Lessons learned	The land has been subject to work from Welsh Water which has caused a lot of damage to the topsoil, so it has been decided that this work will be completed in the summer when the weather has improved to prevent further damage.

Severn Rivers Trust



SRT Allocation: £107,250

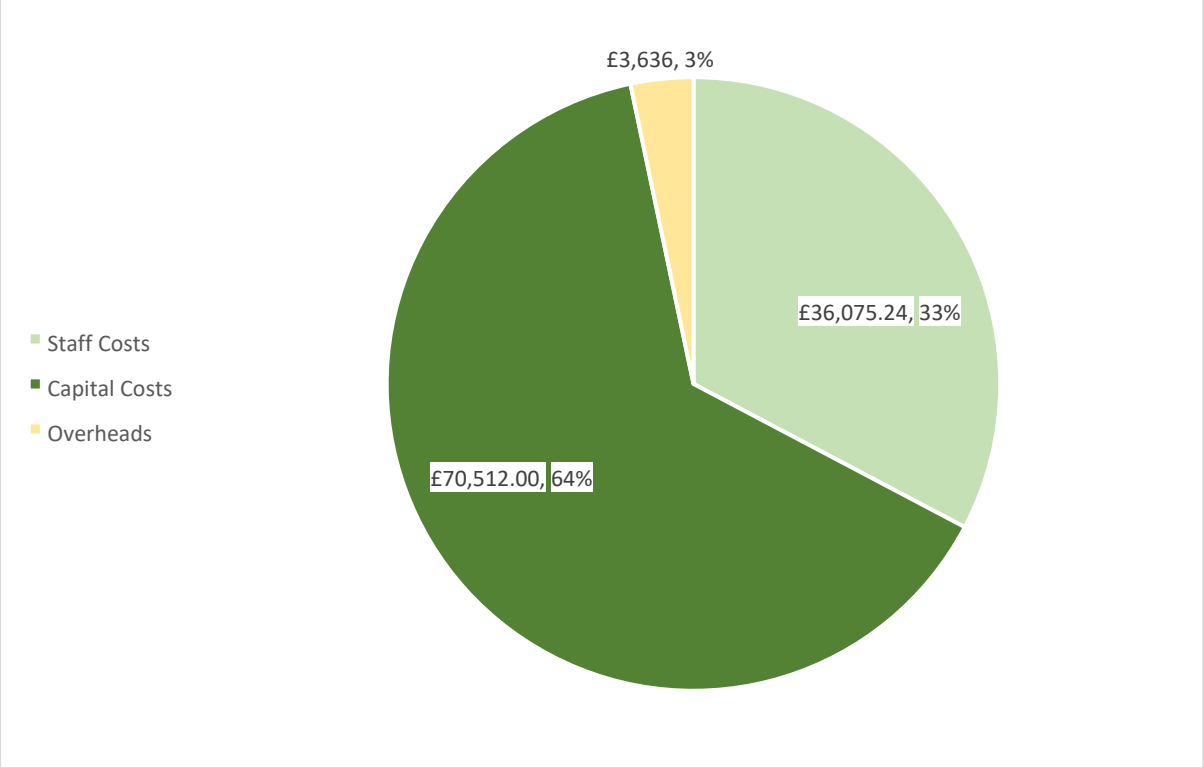
Total Spend: £107,078.95

Number of projects undertaken: 7 (3x habitat restoration, 4x fish passage easement).

KM Fish passage eased: 36

KM Habitat restored: 1

Spend breakdown:



NB: Severn Rivers Trust FishTek reports for fish passage technical easement works attached as appendix.

Fish passage	
Project	Fish passage designs on impassable weirs

Action	Complete designs for fish passage projects at four sites on the Cledan, Llifior, and Caebitra (x2)
NGR	Four sites - SH 99739 06514; SO 19570 98628; SO 23485 92823; SO 20891 90903
Cost	£67,387
Story	Four impassable barriers for fish migration were prioritised and selected by the Severn Rivers Trust and Natural Resources Wales to consider for Assessment and full Options Appraisal and to then move to Detailed Design and stakeholder engagement. An open tender resulted in Fishtek Consulting being appointed to undertake this project. The Options Appraisal has been completed and Detailed Design is underway. Future engagement into 2021/22 has been agreed to take the projects forward to ensure stakeholder buy in, Early Contractor Involvement and securing consents. The intention is that the construction shall take place during the summer of 2022, should funding be located.

Photos Before	**Photos after**
 **Barrier at Sarn on the Caebitra**  **Barrier at Pentreheyling on the Caebitra**	

Barrier at Red Bridge on the Llifior Brook

Barrier on the Cledan

Lessons learned:

Delays to the project caused by staff furlough during the Covid-19 pandemic, caused initial works to be delayed. Increased stakeholder engagement needs to have been undertaken earlier in the process but will take place alongside the detailed design and consent processing.

Habitat Restoration

Project	Green Hall cattle bridge
Action	Installation of cattle bridge and access track.
NGR	SJ16481889
Cost	£16,372
Story	The landowner at Green Hall is involved with the Cain Valley Sustainable Land and Water Management project. Due to funding delays brought about by the Covid19 pandemic, no funds were available under the SMS project for these works. The landowner does have a good relationship with Severn Rivers Trust and is in regular contract with the SMS project manager. 300 cattle cross the river Cain at Green Hall Farm daily between April and October. They are housed in the winter. A cattle bridge was installed by local contractor Gareth Jones, on the recommendation of local farmers to remove this access.

Photos Before

Photos after

The new cattle bridge.

 Photos showing cattle crossing.	

Lessons learned:

The project was delayed until November due to staff furlough during the covid19 pandemic. Works required a Flood Risk Activity Permit (8-week turnaround) and planning permission, followed by ten-week wait on concrete pads once ordered. This caused a tight turnaround time for works, in winter when wet weather could have caused further disruption. A good relationship with the local planning department reduced the amount of time taken to gain planning permission, as information given was correct on application and we were able to meet a deadline for planning meeting.

There was no time for detailed water quality monitoring before and after works.

Habitat Restoration	
Project	Llys, Llanfechain riverbank fencing, and associated tree works.
Action	Fencing 700m of riverbank and associated tree works. Installation of cattle troughs.
NGR	SJ18012015
Cost	£6,855.27
Story	The landowner at Llys is involved with the Cain Valley Sustainable Land and Water Management project. Due to funding delays brought about by the Covid19 pandemic, no funds were available under the SMS project for these works. The landowner does have a good relationship with Severn Rivers Trust and is in regular contract with the SMS project manager. Cattle have access to the river Cain, causing damage to riverbank trees and poaching of banks in summer. 700m of riparian stock fencing was installed by local contractor, Robert Williams. Tree work was undertaken before fencing by local contractor Lottie Des'ascoyne. 500 trees were planted along the riverbank, under the WISE project and partnership agreement with the Woodland Trust in Wales (Coed Cadw). These were planted by Severn Rivers Trust staff and the landowner.

	The landowner gave very positive feedback about the farm visit. She commented on how she felt she trusted SRT and could talk to us, which allowed the works to go ahead.

Photos Before	**Photos after**
  	 

Lessons learned:

Delays to the project caused by staff furlough during the covid19 pandemic, caused works to be delayed until November, when the ground was wet. The field was cropped with turnips, which initially caused the landowner to refuse access. Following a site visit and explanation about Severn Rivers Trust and the works in detail, permission was granted.

Habitat Restoration	
Project	Green Hall farm riverbank fencing and pletching willows.

Action	Fencing 250m of riverbank and associated tree works.
NGR	SJ16185290
Cost	£7,444.68
Story	The landowner at Green Hall is involved with the Cain Valley Sustainable Land and Water Management project. Due to funding delays brought about by the Covid19 pandemic, no funds were available under the SMS project for these works. The landowner does have a good relationship with Severn Rivers Trust and is in regular contract with the SMS project manager. The banks of the river Cain at Green Hall Farm, Llanfyllin are eroding, and large willows are at risk during flood events. Barry Thomas was contracted locally to: • Pletch the willows • Erect 250m of stock fencing to protect regrowth from sheep grazing.

Photos Before	**Photos after**
 View from right hand bank upstream, showing location of new fencing and willows to be pletched.	 Pletched willows on the right hang bank.
	 Location for gate.

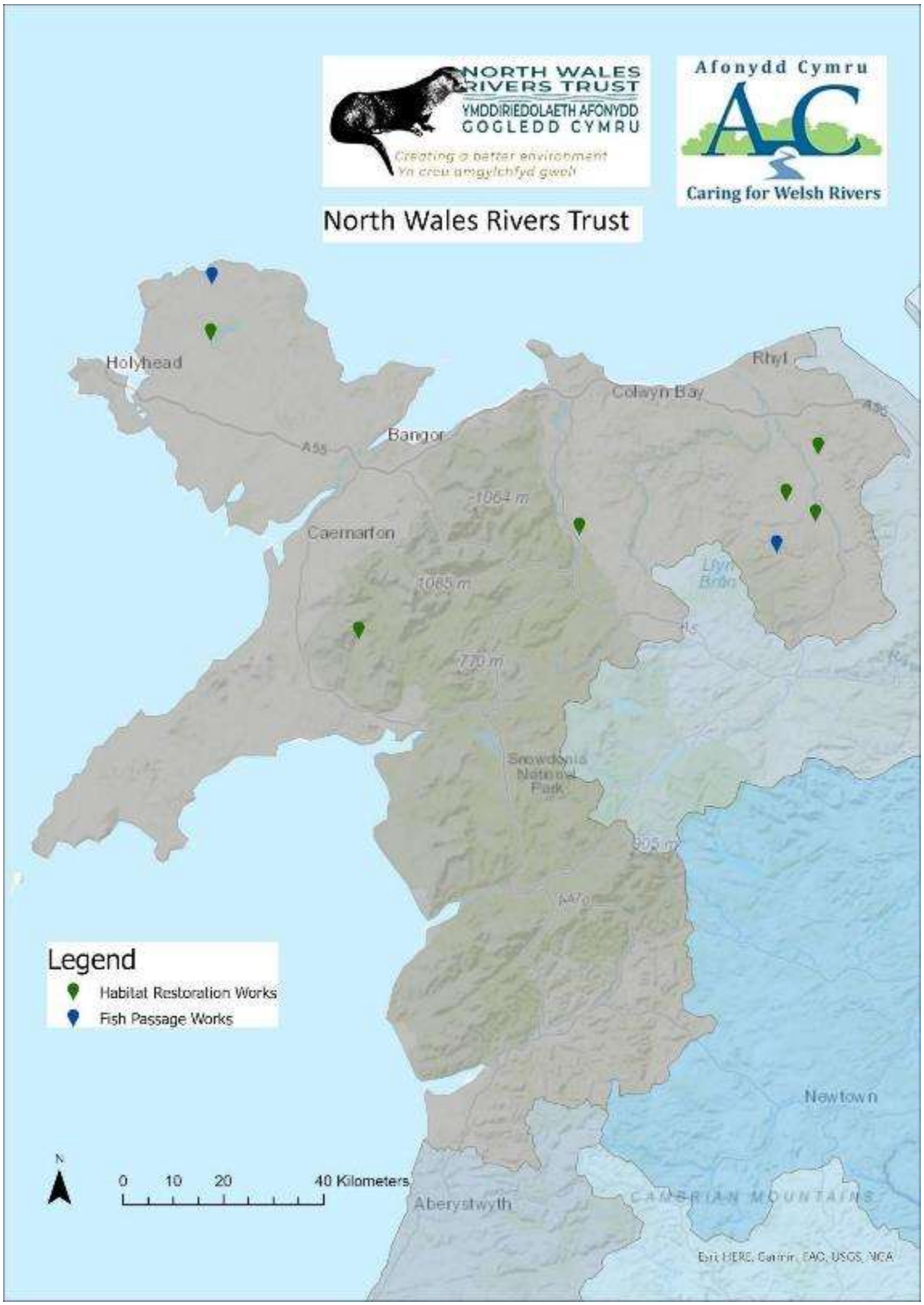
View from right hand bank downstream, showing location of new fencing and willows to be pletched.	 New fencing and pletched willows above and below. 

Lessons learned:

Delays to the project caused by staff furlough during the covid19 pandemic, caused works to be delayed until November, when the ground was wet.

National news about damage to the riverbank on the Usk at the time of works. Additional site visit carried out with contractor to identify trees to be felled and give reassurance that all consents were in place for tree works. Additional clear written guidance given to contractor on percentage of trees to be removed. Due to timing of works and project funds being allocated, this meeting occurred during Christmas holiday. So, there was potential for negative publicity when staff were unavailable. Timing of this project also coincided with local hedge coppicing undertaken by a landowner under Glastir, which had received negative feedback in local Facebook groups. To reduce the risk of negative publicity, additional community engagement was undertaken with Cain Valley River Group and local landowners, prior to works and Christmas break, to explain the purpose of the works. There has been no negative publicity about the project and the local community continue to be fully engaged with catchment management projects.

North Wales Rivers Trust



NWRT Allocation: £115,400

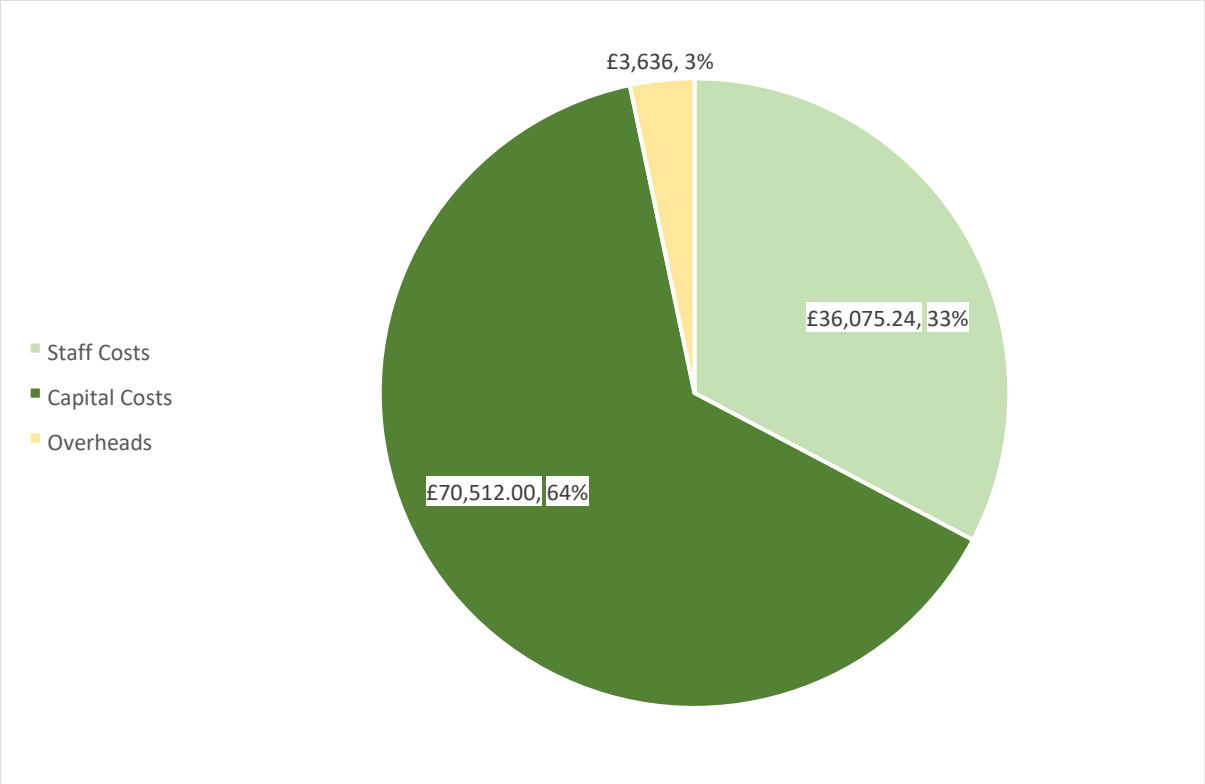
Total Spend: £110,223.24

Number of projects undertaken: 9 (6x habitat restoration, 3x fish passage easement).

KM Fish passage eased: 12.5

KM Habitat restored: 23

Spend breakdown:

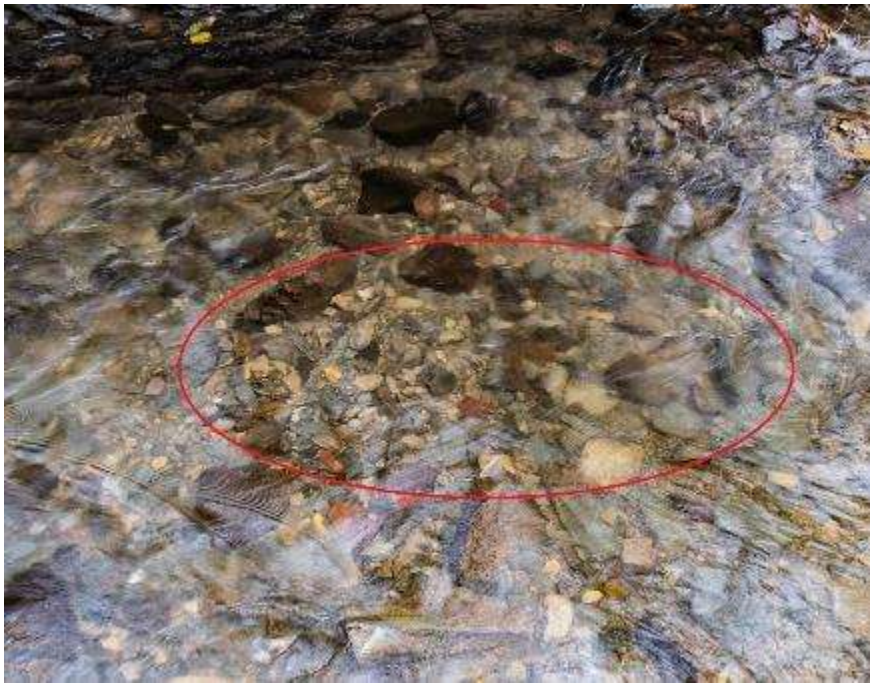


Fish Passage	
Project	Afon Concwest easement
Action	Removal of a large debris/boulder blockage

NGR	SJ 04497 58293
Cost	£4860
Story	The Afon Concwest is a tributary of the Clywedog sub-catchment of the Clwyd near Cyffylliog, Ruthin. A Fisheries Habitat Restoration Survey by the Trust identified a barrier to fish migration consisting of a large debris/boulder blockage in a gorge near the confluence with the Clywedog. NRW electrofishing surveys have found no salmonids upstream of this point, while good stocks remain downstream. The project aimed to improve fish passage over the structure by removing the obstruction and installing a boulder prebarrage downstream.

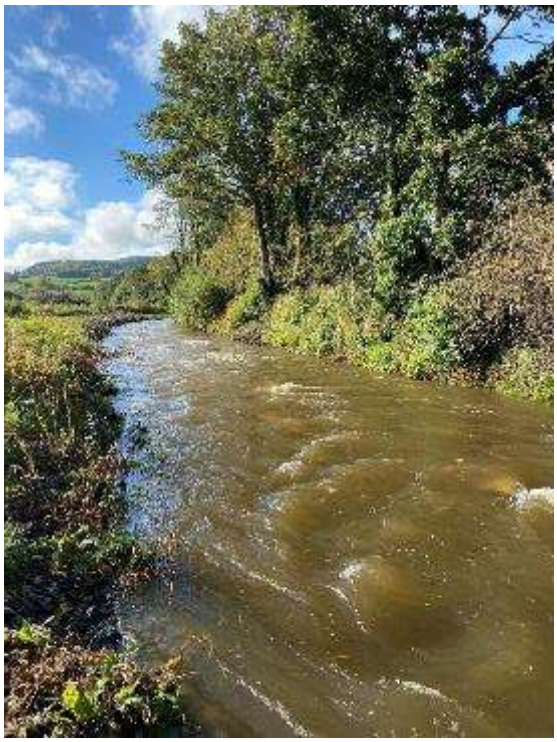
Photos Before	**Photos After**
	
The large (2.5m) boulder and fallen tree/debris blockage in a gorge just upstream of a rockramp easement.	The cleared obstruction with boulder prebarrage in the foreground.
Lessons learned	

Two



trout/seatrout redds observed upstream of the fish easements in November 2020. This is significant as NRW electrofishing data shows no salmonids upstream of the project site in recent years.

Habitat Restoration	
Project	Clywedog Restoration
NGR	SJ 09260 62108
Cost	£12984
Action	Install habitat features on a canalised section
Story	The site is located on the lower Clywedog near Pentre-Llanrhaeadr, approx.3km upstream of the confluence with the Afon Clwyd. Overzealous flood alleviation works carried out by the landowner had effectively dredged approx. 560m of the Afon Clywedog, leaving a featureless, canalized section, lacking in any in-stream habitat diversity. Gravel had been removed from the channel and deposited on the true right bank to bolster an existing flood embankment. The scheme aims to restore the habitat diversity and in-river pool/riffle structure over the dredged length. Natural materials were used to introduce instream structures such as channel constrictors, flow diverters, brash/timber revetment etc to restore a pool/riffle profile that increases biodiversity. Individual boulders were placed at intervals to disrupt the flow and provide refuge areas for fish and other species

Photos Before	**Photos After**
	

Lessons learned

Detail of nearside and far bank brash revetment and in -river boulder placement to give flow variation and refuge structure.
The project had to be completed during a period of high flow and a proportion of the restoration material was set aside for further repair if needed after the winter.

Fish Passage

Project	Afon Wygyr/Meddanen weir easements
NGR	SH 37847 92137
Cost	£4980
Action	Pre-barrage and weir notch easements
Story	Easements were completed on two small concrete weirs at the confluence with the Wygyr and Meddanen near Cemaes Anglesey. The structures are associated with a historic water works and could not be removed. The weirs were notched at centre and removable timber pre-barrages installed to reduce the overall height. The project also involved the clearing of an obstructive reed bed at the confluence and selective thinning of dense overshading vegetation upstream.

Photos Before	**Photos After**
 Weir before	 Weir with notch and removable timber prebarrage

Habitat Restoration	
Project	Nant y Goron Habitat
Action	Approx 800m double bank fencing, coppicing, revetment.
NGR	D/S SH 80875 60918 U/S SH 81390 60585
Cost	£20,208
Story	The Nant y Goron is a salmon and seatrout spawning tributary of the river Conwy at Llanrwst. Natural cascades and waterfalls restrict migratory fish access upstream of the village of Melin y Coed, thereby elevating the importance of the lower reaches. The area between the B5427 and the village consists of predominantly agricultural pasture and has been impacted by overgrazing and bankside poaching by cattle. The existing riparian fencing had fallen into disrepair and severe flooding of the area had further damaged cattle drinking bays and similar infrastructure. The project installed approx. 800m of new stock fence, repairing or replacing three drinking bays and a number of access gates. Extensive coppicing and clearing of flood debris had to be undertaken to prepare the site for fencing.

Photos Before	**Photos after**
 Typical flood damaged fence	 Replaced fence

Old drinking bay destroyed by flooding

Installation of new drinking bay

Lessons learned:

This was a replacement or 'plan B' scheme that was undertaken after the scheduled scheme was cancelled at the last minute after one landowner withdrew permission. It highlights the need for a variety of backup schemes that can be implemented at short notice.

Habitat Restoration	
Project	Afon Wheeler Habitat
Action	Habitat restoration of former trout farm
NGR	D/S SJ09705 69917 U/S SJ09877 70235
Cost	£15,840
Story	The wheeler originates on the slopes of Moel Evan upstream of Nannerch and flows west to meet the Afon Clwyd at Pontruffydd. It is prone to erosion of the soft, sandy soil, especially in overgrazed areas and this fine material easily smothers the abundant spawning gravel. The Old Forge Trout Farm in Bodfari was closed in 2020 and the site infrastructure removed. Discussions with the landowner initially investigated the potential to fence approx. 200m of pasture to exclude stock from the river channel. Recent flooding into this field precluded the installation of a stock netting fence as this would have trapped debris and caused significant damage. The riparian strip was heavily overshaded,

	suppressing the growth of marginal vegetation and the project evolved to coppice and thin this area to promote regeneration. An opportunity arose to landscape and plant native species on approx. 0.8 acres of the old fish-farm site that would have otherwise been turned to agricultural pasture. Decommissioning works had damaged the riparian embankment, leaving tree roots exposed and the scheme imported topsoil to re-profile the banks prior to tree planting. In total the project has helped create almost one acre of riparian woodland, repaired over 100m of bank and encouraged the growth of marginal vegetation by coppicing approx. 300m of overshaded channel.

Photos Before	**Photos after**
	
Old trout farm site before works	During landscaping works

Lessons learned:

This project highlights the need for flexibility and reacting to opportunity when developing a scheme as it started as a standard fencing project and developed into a significant tree planting/wildlife habitat creation scheme.

Habitat Restoration	
Project	Blaen Pennant Habitat
Action	Riparian fencing scheme over 900m
NGR	D/S SH 54047 49201 U/S SH 54089 49883
Cost	£11,640
Story	Blaen Pennant is located at the head of the Cwm Pennant valley on the upper Afon Dwyfor. The river at this point is relatively small but nevertheless an important area for seatrout spawning and many of the tributaries in this region are inaccessible due to natural waterfalls. The channel has been partially fenced in the past but has fallen into disrepair and suffered from recent flood damage, rendering it ineffective. The project aimed to double bank fence the watercourse over an 900m length, including the installation of several drinking bays and replacement or repair of footpath bridges. The naturally boggy moorland terrain restricted the use of large machinery and much of the fencing had to be done manually, accessing the site with a quad bike.

Photos Before	**Photos after**
	
Typical flood damaged/redundant fence	New fence installed.

Old ineffective fence

New fence being installed

Lessons learned:

High rainfall and resulting ground conditions during the period Jan-March threatened the scheduled delivery of this project and the contractor had to be flexible and switch to a manual method in order to complete. The current wet weather trend is making winter delivery of fencing schemes very difficult and consideration for alternative projects is needed.

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