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Eden Crayfish Project

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Project reference no: CRF0039 (ST002)

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Final Report



White-clawed crayfish in the River Leith near Penrith 2012 © Linda Pitkin/2020Vision



Executive Summary

- **£362,300** spent on **31 farms** on **7 rivers** (Lyvennet, Lowther and Eamont, Hoff and Helm Becks, Croglin Water and Hell Gill);
- Installing **26,368 m** of fencing at **22 farms**, protecting **35,420m** of river bank;
- Planting **10,158** broadleaved, native trees at **14 farms**;
- **19 farm plans** produced, leading to farm improvement work at **16 farms** to reduce pollution;
- **£110,000** in grants provided with an additional **£70,000** and considerable **labour and machinery** invested by farmers and land owners
- Examples of work include roofing over cattle feeding yards, manure stores and silage stores to prevent rainwater falling on these areas, becoming contaminated and running off into the river. Farm yards, tracks, guttering and drainage systems were also improved to keep clean rain water separate from dirty areas;
- Stream habitats improved by removing 1 main weir and 6 minor obstacles to improve a 450 m stretch of the beck and opened up two kilometres of river to migratory fish;
- **93 sites** surveyed for white-clawed crayfish surveys, recording **2606 crayfish** on **9 rivers** (Rivers Leith, Lyvennet, Lowther and Eamont, Hoff, Helm, Hayber and Scandal Becks and Croglin Water);
- Native crayfish populations were found to be abundant, stable, healthy and successfully reproducing;
- Community engagement involved **117 days/events** with **21 community groups** and the general public, reaching **2408 people**, involving **363 volunteers**, **445 volunteer days** and **2488 volunteer hours**.

Contents

1. Project aims
 2. Project targets
 3. Project outputs
 - 3.1 Summary
 - 3.2 Fencing
 - 3.3 Tree planting
 - 3.4 Farm plans
 - 3.5 Farm improvement works
 - 3.6 In-stream habitat improvements
 - 3.7 Monitoring
 - 3.8 Community engagement and volunteers
- Pictures illustrating the Eden Crayfish CRF Project
- Annex 1 Location of all projects carried out under the Eden Crayfish CRF Project 2012-2014
- Annex 2 Location of all sites surveyed for native crayfish under the Eden Crayfish CRF Project 2012 – 2014
- Annex 3 Summary of Eden Crayfish CRF Project work
- Annex 4 Summary of Eden Crayfish CRF Community Engagement 2012 – 2014
- Annex 5 WFD Status and SAC Condition for target sub-catchments

1. Project aims

The project was aimed at improving the habitat and water quality of rivers within the Eden catchment in Cumbria. The River Eden is of international importance for its wildlife and is designated as a Special Area of Conservation (SAC). It supports many significant species including white-clawed crayfish, salmon, trout, eel, bullhead, lamprey, otter, water vole, invertebrates of river shingle and water crowfoot. The Eden is the best remaining stronghold of the endangered white-clawed crayfish, which is threatened and declining across the UK and Western Europe.

2. Project targets

Project targets comprised the following:

- Conservation actions to improve the river for crayfish and other wildlife:
 - Installing riverside fencing (20 km);
 - Planting riverside trees (6,000);
 - Producing 20 farm assessments in areas of crayfish populations;
 - Carrying out improvement work on 20 farms to reduce diffuse pollution;
 - Carrying out in-stream habitat improvements at 5 locations.
- Monitoring actions to assess the impact of project work:
 - Surveying 10 key crayfish populations and 6 ark site populations;
 - Conducting fixed point photography monitoring of the river at 25% of all works locations.
 - Carrying out crayfish surveys at 25% of all works locations;
 - Repeating farm assessments at 25% of farms involved.

3. Project outputs

3.1 Summary

Conservation work comprising riverside fencing, tree planting and farm improvements to reduce pollution were carried out within the Eden Valley. A total of **£362,300** was spent at **31 farms** on **seven rivers** in the River Eden system (Rivers Lyvennet, Lowther and Eamont, Hoff and Helm Becks, Croglin Water and Hell Gill - see maps at Annex 1 and 2). Details of all projects are listed in Annex 3 and 4.

3.2 Fencing

Rivers were improved by riverside fencing to prevent farm animals trampling river banks and polluting the water. A total of **26,368 m of fencing** was installed at **22 farms, protecting 35,420m of river bank** (project target was 20 km of fencing).

3.3 Tree planting

A total of **10,158 broadleaved, native trees** were planted along river banks at **14 farms** to stabilise river banks and improve river habitats for wildlife (project target was 6000 trees).

3.4 Farm plans

Farm assessments were carried out at **19 farms** to produce farm plans which advised farmers on how to reduce pollution from their farms (project target was 20). The plans were the basis for grants to farmers who implemented the recommendations and thereby reduced pollution reaching the river (see 3.5 below).

At the end of the project repeat visits were made to five farms where farm plans had been produced and work to reduce diffuse pollution had been undertaken (project target was 25% of locations). Updated farm plans were produced and provided to farmers to encourage continued efforts to reduce diffuse pollution from agriculture.

3.5 Farm improvement works

The farm plans led to improvement work being carried out at **16 farms** to actively reduce pollution in the river. Grants totalling **£110,000** were provided to farmers and land owners to carry out the work. They contributed a further **£70,000** and considerable **labour and machinery** to complete these projects.

Examples of the type of work carried out include roofing over cattle feeding yards, manure stores and silage stores to prevent rainwater falling on these areas, becoming contaminated and running off into the river. Farm yards, tracks, guttering and drainage systems were also improved to keep clean rain water separate from dirty areas. A sediment pond was created along a stream to collect soil, manure and fertiliser and prevent it entering the river. A farm adjacent to the river with inadequate manure management systems was de-commissioned to prevent any future pollution problems.

Eden Rivers Trust received an additional allocation of **£10,000** during the project to purchase a sub-soiler to address soil compaction issues in the Morland Beck catchment. This was purchased and is available for farmers in the Morland Beck area to use when appropriate. It will increase rainwater infiltration in to the soil, reduce sediment and nutrient run-off in to the river and increase soil health and productivity.

3.6 In-stream habitat improvements

A weir which posed a significant obstacle to migrating fish was removed on the Morland Beck, a tributary of the River Lyvennet, near Cliburn. In addition, 6 minor obstacles upstream of the weir were removed. This improved the habitat on a 450 m stretch of the beck and opened up two kilometres of river to migratory fish. At Crosby Ravensworth a 75 m stretch of Howe Beck, a tributary of the River Lyvennet, was re-meandered to increase the diversity of the beck and improve conditions for wildlife (project target was 5 locations).

3.7 Monitoring

Annual white-clawed crayfish surveys were carried out on nine rivers at a total of **93 sites** and **2606 crayfish** were recorded. The rivers studied included the Rivers Leith, Lyvennet, Lowther and Eamont, Hoff, Helm, Hayber and Scandal Becks and Croglin Water. The populations were found to be abundant, stable, healthy and successfully reproducing.

The American signal crayfish were found for the first time in the River Eden system in 2012. They were discovered in Warnel Beck, a tributary of the River Caldew where no native crayfish occur. Trappy traps were used to investigate the extent of the signal population and they were found many miles downstream of the source beck towards Dalston. For six weeks in 2013 signals were collected and destroyed from one short stretch of Warnel Beck and although the size of the individuals collected did decrease the overall numbers did not show enough of a depletion to warrant continuing the process.

The survey work investigated 10 key crayfish populations, including 6 safe havens or “ark” sites (project target was 10 key populations and 6 ark sites).

Crayfish surveys were carried out in all catchments where habitat improvement work was undertaken. The survey sites included 15 of the 31 farms where fencing, tree planting or farm improvement work had been carried out (project target was to survey 25% of locations).

Fixed point photography of the river was carried out at 10 of the 31 different farms where fencing, tree planting or farm improvement work had been carried out (project target was to record 25% of locations). These will be useful for monitoring future changes in the rivers concerned.

3.8 Community engagement and volunteers

Community engagement during the period of the project involved **117 days/events** with **21 community groups** and the general public, reaching **2408 people**, involving **363 volunteers**, **445 volunteer days** and **2488 volunteer hours**. Details of all events are shown in Annex 4.

Joanne Backshall
Eden Rivers Trust
8 May 2015

Pictures illustrating the Eden Crayfish CRF Project



Completed riverside fencing on the River Lowther at Rosgill, Shap



Completed tree planting and new sediment collection pond at Crosby Ravensworth



Chris West of ERT with Richard Carruthers of Rawfoot farm showing the new roof over a cattle feeding yard which will reduce pollution entering the River Lowther



Volunteers crayfish surveying on the River Leith near Penrith in 2012 and measuring crayfish on the Croglin Water in 2013



Volunteers on Eden Rivers Trust's Crayfish Survey Training Day July 2012



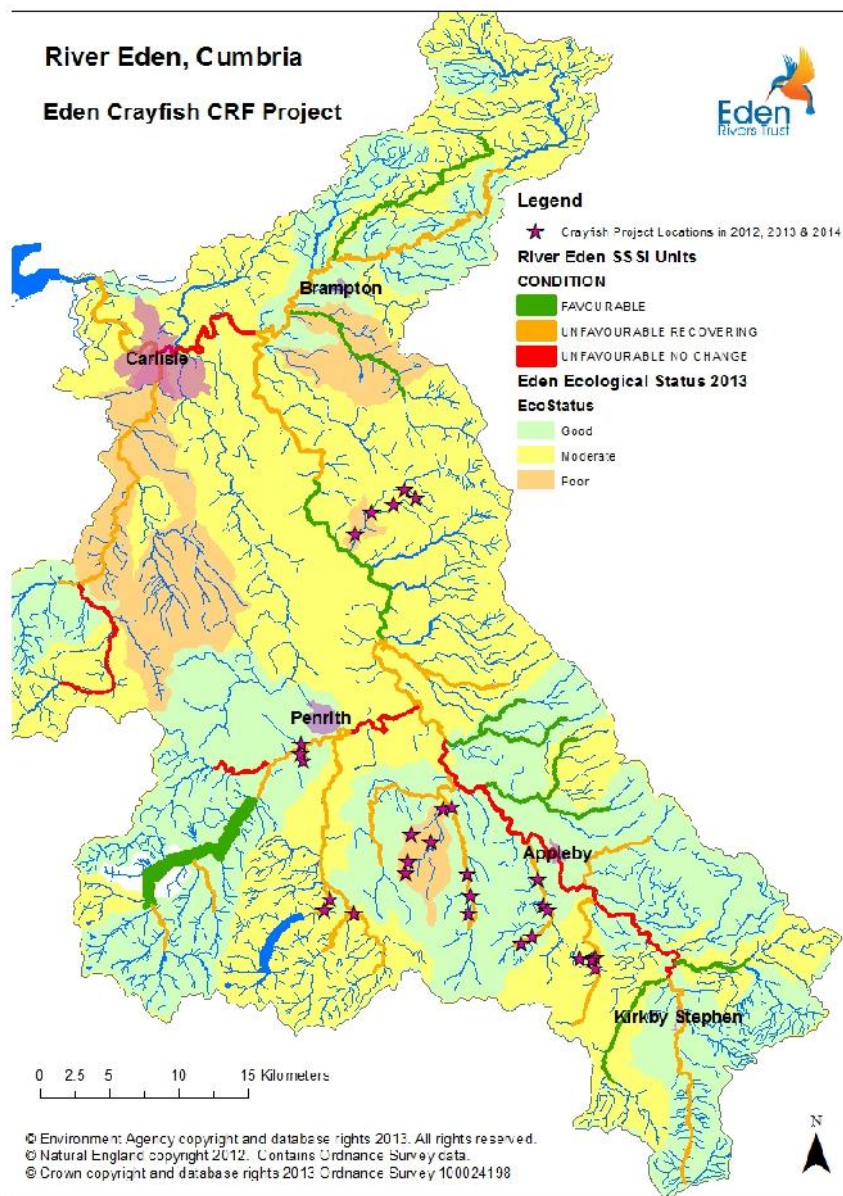
Volunteers on Eden Rivers Trust's Crayfish Survey Training Day July 2013



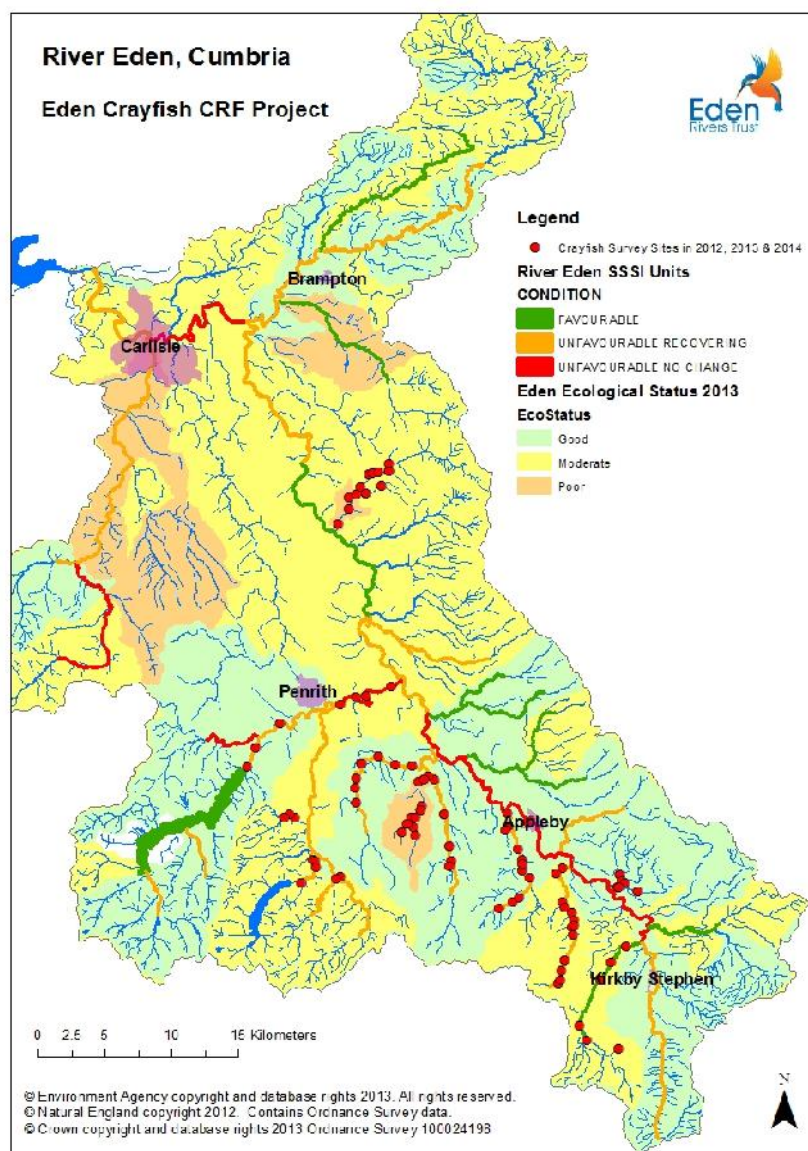
Volunteers on Eden Rivers Trust's Crayfish Survey Training Day July 2014

Annex 1 Location of all projects carried out under the Eden Crayfish CRF Project 2012-2014

Commented [DG1]: Appendices rather than annexes?



Annex 2 Location of all sites surveyed for native crayfish under the Eden Crayfish CRF Project 2012 - 2014



Annex 3 Summary of Eden Crayfish CRF Project work

	River	Farm	Fencing (m)	Bank protected (m)	Trees planted	Farm Plans	Farm Capital works	In-stream works	Grid References
			Target 20 km		Target 6000	Target 20	Target 20	Target 5 sites	
1	Lyvennet	Lansmere Farm, Newby	–	–	–	✓	✓	–	Farm at NY 58124 21689
2	Lyvennet	Towcett Farm, Towcett, Shap	450	900	–	✓	✓	–	Newby Beck Top NY 57725 18637 Mid NY 57674 18921 Bottom NY 57896 19211
3	Lyvennet	Dedra Banks, Newby	550	550	–	✓	✓	–	Long Sike Top NY 57688 19647 Mid NY 57832 19706 Bottom NY 57877 19601
4	Lyvennet	Brackenbank, Newby Beck, Newby	800	800	120	–	–	–	Newby Beck Top NY 59563 20973 Mid NY 59562 21134 Bottom NY 59546 21284
5	Lyvennet	Crossrigg Hall, Cliburn	–	–	–	–	–	Weir removal (1 main, 6 smaller)	Morland Beck Top 60148 23500, Mid 60396 23559, Bottom 60547 23618. Including 450 m of river habitat improved and 2 km of Morland Beck opened up to migratory fish.
6	Lyvennet	Birdby, Cliburn	320	370	600	–	–	–	River Lyvennet Top NY 61026 23578, Mid NY 61039 23662, Bottom NY 61051 23757
7	Lyvennet	Meaburn Hall, Maulds Meaburn	4170	4740	4500	✓	✓	–	River Lyvennet Top NY 62473 16926 Mid NY 62400 17283 Bottom NY 62215 17566 and Howe Beck Top NY 62170 16692 Mid NY 62151 17111 Bottom NY 62215 17566
8	Lyvennet	Barnskew, Maulds Meaburn	–	–	–	✓	✓	–	Farm at NY 62150 18837

9	Lyvennet	Craketrees, Crosby Ravensworth	320	640	1143	–	✓	Re-meandering	Howe Beck Top NY 62289 15812, Mid NY 62250 15951, Bottom NY 62220 16111
10	Hoff Beck	Friendship Farm, Hoff	780	740	–	✓	–	–	Hoff Beck Top NY 67559 16105, Mid NY 67653 17088, Bottom NY 67617 17256
11	Hoff Beck	Low Rutter, Hoff	4782	6659	500	✓	✓	–	Hoff Beck Top NY 68128 16163 Mid NY 67625 16559 Bottom NY 67599 16966
12	Hoff Beck	Newlands Farm, Drybeck	180	180	–	✓	–	–	Hoff Beck Top NY 68000 16194, Mid NY 67920 16234, Bottom NY 67833 16258
13	Hoff Beck	Swathburn, Great Asby	–	–	–	✓	✓	–	Farm at NY 70238 12737
14	Hoff Beck	Barwise Hall, Hoff	–	–	800	–	–	–	Hoff Beck Top NY 67293 18353 Mid NY 67247 18443 Bottom NY 67202 18538
15	Hoff Beck	Sycamore Rise, Great Asby	280	280	–	–	–	–	Scale Beck Top NY 66747 14242 Mid NY 66850 14293, Bottom NY 66990 14336
16	Hoff Beck	Halligill, Great Asby	1488	2000	470	–	–	–	Scale Beck Top NY 65902 13779 Mid NY 66013 13797 Bottom NY 66119 13836
17	Helm Beck	Low Griseburn, Asby	–	–	–	✓	–	–	Farm at NY 71384 12825
18	Helm Beck	Dona Close, Asby	740	1350	200	✓	–	–	Helm Beck Top NY 71576 11730, Mid NY 71368 11989, Bottom NY 71323 12271
19	Helm Beck	High Griseburn, Ormside	–	–	–	✓	✓	–	Farm at NY 71142 12645
20	Lowther	Rosgill Hall, Rosgill, Shap	5665	6070	–	–	✓	–	River Lowther Top NY 54508 15805 Mid NY 53948 15983 Bottom NY 535421 516497 and Swindale Beck Top NY 53127 15473 Mid NY 53524 15921 Bottom NY 53543 16364

21	Lowther	Rawfoot, Bampton	200	200	–	✓	✓	–	Haweswater Beck Top NY 52178 16922 Mid NY 52198 17013 Bottom NY 52217 17116
22	Lowther	Thornthwaite Hall, Bampton	–	–	450	–	–	–	Haweswater Beck Top 51108 16059 Mid 51863 16186 Bottom 52130 16863
23	Croglin	Raygarthfield, Croglin	456	1174	–	✓	✓	–	Lino Beck Top NY 57770 46471, Mid 57661 46599, Bottom 57631 46743
24	Croglin	Croglin Low Hall, Croglin	587	587	–	✓	–	–	Briggle Beck Top NY 55462 44996, Mid NY 55227 44943, Bottom 54923 44927
25	Croglin	Croglin High Hall, Croglin	265	530	75	✓	✓	–	Briggle Beck Top NY 56916 45550 Mid NY 56822 45510 Bottom NY 56721 45464
26	Croglin	Davygill, Croglin	520	520	300	✓	✓	–	Lino Beck Top NY 58710 45692 Mid NY 58437 45997 Bottom NY 58079 46798
27	Croglin	Fog Close, Croglin	865	1730	200	–	–	–	Croglin Water Top NY 54282 43446 Mid NY 54024 43357 Bottom NY 53916 43113
28	Eamont	Greystone House, Stainton	450	900	300	✓	✓	–	River Eamont Top NY 50003 28182 Mid NY 50188 28228 Bottom NY 50404 28151
29	Eamont	Sockbridge Hall, Stainton	–	–	–	✓	✓	–	Farm at NY 50330 27030
30	Eamont	HallBank, Stainton	500	500	500	–	–	–	River Eamont Top NY 49864 27725 Mid NY 50050 27505 Bottom NY 50360 27936
31	Hell Gill	Hell Gill, Mallerstang	2000	4000	–	–	–	–	Hell Gill Top NY 79952 97945 Mid NY 79230 97381 Bottom NY 78648 96871
	Total		26368	35420	10158	19	16	7 sites	

Annex 4 Summary of Eden Crayfish CRF Community Engagement 2012 - 2014

	Community Events	Days	People	Volunteer days	Volunteer hours
3	National Trust Acorn Bank Apple Day in 2012, 2013 & 2014	3	275	-	-
1	Great Asby After School Club – River dipping	0.5	12	-	-
1	Shap Cubs – River dipping	0.5	28	-	-
1	Education day with Crosby Ravensworth School at Meaburn Hall, River Lyvennet to learn about the river and produce material for the school and ERT website	1	23	23	100
1	Exhibition produced by Crosby Ravensworth School put up at Maulds Meaburn Village Institute	0.5	13	6.5	26
2	Summer Camp with Eden Community Outdoors at Scandal Beck	2	29	29	91
1	Cumbria Blue Badge Tourist Guides awareness raising day with ERT	1	7	7	42
3	Enterprise Mouchel awareness raising event with their staff as well as local authority representatives and local school children	3	240	-	-
1	Carlisle Bitts Park Family Fun Day	1	125	-	-
	Volunteer Events				
5	Crayfish Survey Training in 2012, 2013 and 2014	5	60	60	360
46	Crayfish Surveys in 2012, 2013 and 2014	46	100	181	1123
1	Volunteer taster day on crayfish surveying and invertebrate sampling	1	5	5	30
1	Volunteer signal crayfish monitoring day on River Caldew	1	5	2.5	13
6	Signal crayfish survey and removal carried out in River Caldew	6	29	29	174
3	Volunteer crayfish rescues at Meaburn Hall on the River Lyvennet	3	42	31	149
1	Volunteer tree planting day at Morland Beck, Newby	1	7	7	24
1	Volunteer guided walk at Meaburn Hall, River Lyvennet	1	24	12	94
1	Volunteer and Crosby Ravensworth School tree planting day on River Lyvennet at Maulds Meaburn	1	20	15	75
1	Volunteer tree planting day with Penrith Lions, Stainton and Yanwath School on River Eamont at Stainton	1	63	35	177
	Volunteer helping with GIS mapping of projects and survey data	2	1	2	10
	Talks				
2	Cumbria University - Animal Conservation students – x 2 events	1	9	-	-

1	Greystoke Social Club	0.5	15	-	-
1	Penrith Library	0.5	18	-	-
1	Pooley Bridge & District Women's Institute	0.5	20	-	-
1	Eden Valley Vintage Tractor Club	0.5	25	-	-
1	Newton Rigg Countryside Management students – talk and site visit to River Leith	7			
2	Maulds Meaburn Village Institute x 2 presentations	1	75	-	-
2	Carlisle Natural History Society x 2 presentations	1	98	-	-
1	Kirkby Stephen Angling Association	0.5	14	-	-
1	Appleby 41 Club	0.5	13	-	-
1	Border 41 Club	0.5	20	-	-
1	Pooley Bridge and District Women's Institute	0.5	20	-	-
1	Askham Ladies Group	0.5	10	-	-
1	Bewcastle Heritage Society	0.5	9	-	-
1	Penrith Inner Wheel	0.5	18	-	-
1	Crosby Ravensworth Parish Council	0.5	7	-	-
1	Stainton 1.30 Club	0.5	12	-	-
1	Penrith Tuesday Club	0.5	50	-	-
1	Dacre Women's Institute	0.5	18	-	-
1	Penrith Soroptomists	0.5	15	-	-
1	Watermillock Women's Institute	0.5	18	-	-
	Agricultural Shows				
3	Penrith Agricultural Show in 2012, 2013 & 2014	3	275	-	-
3	Newton Rigg College Countryside Day in 2012, 2013 & 2014	3	180	-	-
2	Appleby Agricultural Show in 2012 & 2013	2	61	-	-
2	Dufton Agricultural Show in 2013 & 2014	2	110	-	-
1	Skelton Agricultural Show in 2014	1	90	-	-
2	Brough Agricultural Show in 2013 & 2014	2	100	-	-
117	Totals	112	2408	445	2488

Annex 5 WFD Status and SAC Condition for target sub-catchments

Source:

- <http://environment.data.gov.uk/catchment-planning/ManagementCatchment/25>
- <https://designatedsites.naturalengland.org.uk/ReportUnitCondition.aspx?SiteCode=S2000215&ReportTitle=RIVER%20EDEN%20AND%20TRIBUTARIES>

River	WFD Status 2013	Reason for failure	SSSI Condition 2010	SSSI Units	Adverse Condition Reasons
Leith	Moderate	Phosphate	Unfavourable Recovering	213	Water quality
Lyvennet	Good	-	Unfavourable Recovering	212	Hydromorphology & classed "at

					risk”
Morland Beck (Lyvennet)	Moderate	Fish, pH, copper (fail)	Not SSSI	N/A	N/A
Hoff Beck – Lower	Good	-	Unfavourable Recovering	209	Not available
Hoff Beck – Upper	Moderate	Macrophytes and Phytobenthos combined	Unfavourable Recovering	209	Not available
Scale Beck (Hoff Beck)	Good	-	Unfavourable Recovering	209	Not available
Helm Beck	Poor	Macrophytes and Phytobenthos combined	Unfavourable Recovering	206	Not available
Hayber Beck (Low Gill, Crooks Beck)	Moderate	Fish	Not SSSI	N/A	N/A
Lowther - Lower	Moderate	Hydromorphology & surface water	Unfavourable Recovering	216	Hydromorphology & classed “at risk”
Lowther - Upper	Moderate	Hydromorphology & surface water	Unfavourable Recovering	216	Hydromorphology & classed “at risk”
Haweswater Beck (Lowther)	Moderate	Hydromorphology, phosphate, zinc (fail) & surface water	Unfavourable Recovering	216	Hydromorphology & classed “at risk”
Swindale Beck (Lowther)	Moderate	Hydromorphology & surface water	Unfavourable Recovering	216	Hydromorphology & classed “at risk”
Croglin Water - Lower	Poor	Fish	Not SSSI	N/A	N/A
Croglin Water - Upper	Poor	Fish	Not SSSI	N/A	N/A
Briggle Beck (Croglin)	Poor	Fish & phosphate	Not SSSI	N/A	N/A
Eamont - Lower	Moderate	Fluoranthene (fail)	Unfavourable No Change	222	Agriculture
Eamont - Upper	Good	-	Unfavourable Recovering	221	Hydromorphology & classed “at risk”
Scandal	Moderate	Macrophytes	Favourable	203	Not available

Beck (Eden Upper)		and Phytobenthos combined			
Hell Gill (Upper Eden)	Good	-	Not SSSI	N/A	N/A