SOLWAY TO SOURCE LITTER CLEAN

Summary report

Abstract

Pollution of Scotland's seas is becoming an ever-growing problem and something that can be reduced. 80% of marine pollution comes from terrestrial and riverine environments. The Solway to Source Litter Clean project is tackling that problem by removing litter from the River Annan and its associated coastline, addressing the problem at source before it can pollute the marine environment.

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Acknowledgements

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1. Introduction

The River Annan is approximately 40 miles long and runs from its source in the Moffat hills to its end at the river mouth in Annan where it meets the Solway Firth. Historically, it has been a well visited tourist area, and the river is used by anglers, walkers, tourists and Scotland's wildlife. Important fauna species include Atlantic salmon, seatrout, river lampreys, red squirrels, and otters. In recent years there has been a decline in salmon numbers in Scottish rivers resulting in it becoming an IUCN (International Union for Conservation of Nature, 2024) red listed species. In the River Annan the salmon numbers have reduced from 2255 in 2011 (Chisholm, et al., 2012) to 148 in 2023 (Colville, et al., 2023). Local industry has also expanded over time and began to use the river which also brings potential challenges. The industrial use of the river can not only directly impact the river and the species within but also alter the perception of the river to locals and tourists. The Annandale Way is a tourist footpath route that follows the River Annan and has become popular during summer months. But increased foot traffic comes with its own anthropogenic problems for the river, mainly litter. This littering problem is also increased due to the proximity of some major roads that transect the course of the river (e.g. the A75 and M74) and is increased where there are overnight parking laybys and motorway service areas. The River Annan District Salmon Fisheries Board (RADSFB) has partnered with SeaScope Fisheries Research (SeaScope), local volunteer groups and local communities to help clean the litter from the River Annan and local coastline and to try and identify and quantify the litter and its origin.

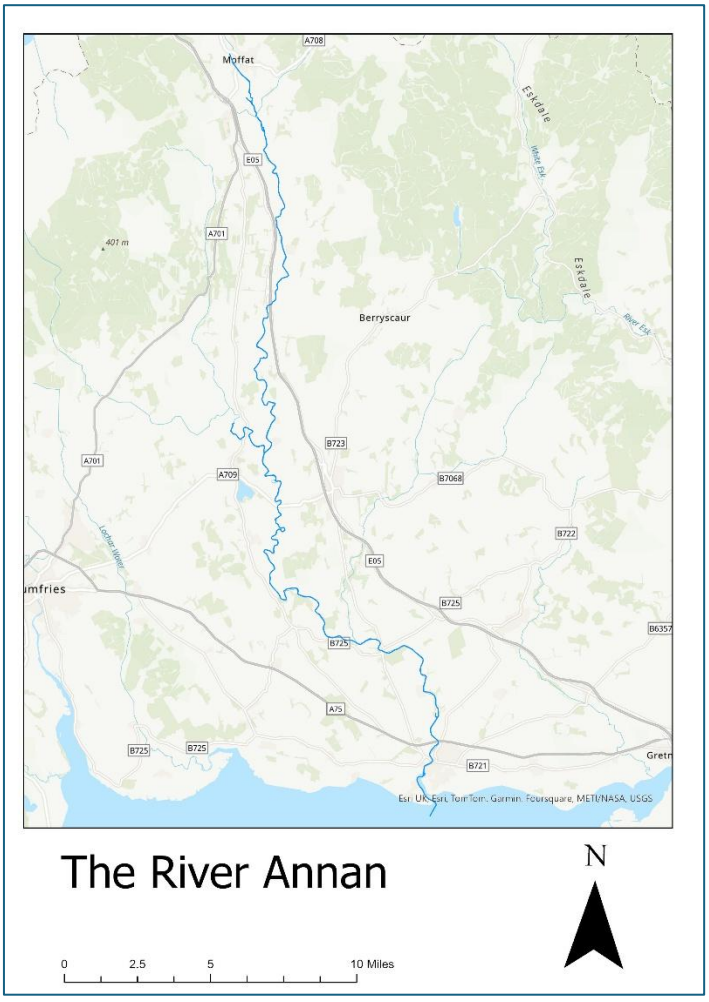

Figure 1. The main stem of the River Annan

2. Methodology

2.1 Aims and objectives

The Solway to Source project was established to address marine pollution before it had a chance to enter the marine environment and become a wider problem globally, by removing it from the river ecosystem before it could be washed down to the sea. The main aims of the project were:

1. Remove waste materials and improve the condition of the River Annan and its associated coastline.
2. Raise public awareness of marine environmental issues.
3. Engage with communities to improve the image of the River Annan and Solway Firth.
4. Improve and encourage responsible access to the coastal and marine spaces.
5. Collaborate with likeminded organisations and increase awareness of the litter issue

Figure 2. Beach cleaning at Newbie

2.2 Method of Delivery

Given the extent of the littering issue in the River Annan it was decided that a "two-sweep" approach to tackling the pollution should be adopted, An initial sweep in the autumn prior to winter flooding to immediately reduce the waste entering the marine environment, followed by a second sweep in the late winter to address anything missed during the first sweep or added between the two sweeps. Litter may have been hidden by vegetation and is now exposed, and new litter would have entered the river system during floods and through new fly tipping and general littering events. An initial visit to the river and potential access points was undertaken to allow for mapping and route planning. Recruitment of volunteers, engaging communities, and raising awareness was done on a continual basis throughout the duration of the project.

The RADSFB engaged with local anglers, youth organisations and colleges through in person engagement. Social media was also a tool used to recruit volunteers through Facebook pages and groups. Throughout the project there was collaboration with Solway Firth Partnership (SFP) who aided in finding volunteers and also publicising our litter cleaning days on their online diary,

so that public-spirited volunteers could join. Volunteers have been present on almost all stretches of the river Annan and associated coastline, despite the physical challenges that it presents. Providing locally sourced lunches and refreshments increased morale throughout the project which allowed for sustainable and continued recruitment.

Figure 3. Example of the poster used to recruit volunteers.

D&G Climate Hub also aided in volunteer outreach and recruitment by sharing social media posts. A climate officer also volunteered time to take part during one of the beach clean days and engaged volunteers with one of their projects in an effort to share knowledge and help promote the marine and coastal space.

To raise awareness of the marine and riverine environmental issues, local news televised (Border News Annan Litter Clean) and brought large scale awareness of the project and why the River Annan and coastal areas were being cleaned.

3. Results

Throughout the project we collected litter from approximately 146.97 miles of riverbank and coastline, with a total of 2,526kg of litter collected and prevented from entering the river and marine environment. This equates to 421 bags of litter at an average weight of 6kg/bag. It took approximately 1188 staff hours, 384 volunteer hours across 38 individuals to complete the

physical collection of the litter. Several volunteers took part on multiple days. There was an average density of litter of 22.8kg/km on the first sweep and 12.44kg/km on the second sweep (Appendix 1 and Appendix 2). The highest densities were found on the coast and on a large flood plain at Shillahill Bridge during the first sweep and the shoreline, and a blockage on the upper Annan between Three Waters Meet and the Moffat Nature Reserve during the second sweep. The reduced density of litter in the second sweep was confirmation of the large aggregation of litter over several years and the thoroughness of the litter cleaning during the first sweep. However, the presence of such high levels still being present during the second sweep indicates that litter is still entering the river on a continual basis and that some was hidden amongst vegetation during the first sweep and only became visible once the vegetation had died away during the winter. Increased density of litter on the beaches could have been due to floods and adverse weather displacing litter in the river or being washed inshore and deposited on the coastline, or a factor of the increased volunteer numbers associated with the second sweep.

Figure 4. a) shows a blockage on the upper River Annan identified on the second sweep. b) shows the same area after it had been cleared of the blockage, allowing for a clear and natural stream flow and improved access upstream for spawning fish.

3.1 Project summary

The Solway to Source Litter Clean project encountered many challenges; logistically, physically and socially. Trying to follow the course of the River Annan closely often meant accessing the riverside in remote areas, walking on unpaved and rough tracks, clambering through dense woods and vegetation, traversing fences, and often having several miles between access and parking locations. All these presented us with many logistical challenges throughout the project. Physically this project was demanding on staff and volunteers, the sheer distance covered of 146.97 miles across unfavourable walking conditions, around tributaries and over fences was very challenging. This is a straight-line equivalent of walking from Annan to Aviemore. This physical demand meant that the selection of volunteers had to consider each person's physical suitability for the stretch of river or coast to be cleaned. Finally, the effort to raising interest in volunteers proved to be its own challenge. Beach cleans at weekends understandably raised the highest interest from volunteers and allowed a broader range of volunteers to be physically suitable. Whereas on very thin bankside tracks it was more appropriate to have a maximum of 2 volunteers per day partnered with staff, due to space and terrain. This allowed these stretches to be completed during weekdays when less volunteers were available.

The marine and riverine environments definitely benefitted from the increased attention to waste collection. The project reached a wide audience and brought many likeminded people together

to reach a common goal. The project allowed for successful collaboration with many different organisations to enable communities local to the River Annan to be involved. The project also provided a chance to aid local business and initiatives, through support and providing a platform to be visible and increase their exposure and the profile of the local region. This project helped bring together many different people and introduce them to the green and blue spaces of Dumfries and Galloway. Utilising Facebook pages, such as the Powfoot and Cummertrees page, helped highlight these places as areas where locals are trying to improve the local environment and so increase their public visibility and potential as a nice area for tourists to visit and stay.

Figure 5. Castle Milk Estates and Robert Humes Youth Organisation volunteering on the Shillahill Bridge floodplain.

4. Future Projects

Although this project managed to remove 2,526kg from the river and marine environment there is still a considerable amount that still needs to be removed. Especially large items that could not be manually removed or items that were semi -buried in the riverbanks or submerged in the river. Ideally these could be removed during a new future project. Also, the second sweep of the river still yielded 36% of the overall total litter removed, which demonstrates that flooding and winter plant die-off reveals additional waste material that was not previously accessible, and that new additional waste is constantly entering the ecosystem. The river and local coastline would benefit from annual organised litter cleans. The nature of the environment being cleaned and the accessibility of some areas means that volunteers cannot always be relied upon to complete this work safely or thoroughly. RADSFB intends to apply again for funding to undertake a litter clean programme and to recruit and supervise volunteers as part of a wider project in 2025/26. This

project will also involve SeaScope and the University of Glasgow, and will investigate microplastics in the soil, fauna and flora of the River Annan and the adjacent local coastline.

Figure 6. Volunteers and Staff with a haul of litter from a small stretch of coastline at Powfoot.

6.References

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Appendix 1

Date of Clean	Location	Bags	KG	Length Cleaned (m)	Length Cleaned (km)	Litter Density kg/km
09/09/2024	Powfoot	15	90	3141	3.141	28.7
10/09/2024	Newbie	12	72	2170	2.17	33.2
16/09/2024	Annan	10	60	6480	6.48	9.3
17/09/2024	Brydekirk	9	54	5340	5.34	10.1
23/09/2024	Hoddom	5	30	7117	7.117	4.2
24/09/2024	Williamwath Bridge	5	30	3817	3.817	7.9
14/10/2024	Bengal Farm	5	30	2522	2.522	11.9
15/10/2024	Shillahill Bridge	30	1010	1900	1.9	531.6
07/10/2024	Dryfeholm	4	24	4205	4.205	5.7
08/10/2024	Millhousebridge	5	30	3205	3.205	9.4
16/10/2024	Spedlins Castle	4	24	3070	3.07	7.8
21/10/2024	Johnstonebridge	8	48	4837	4.837	9.9
28/10/2024	Wamphray	6	36	4441	4.441	8.1
29/10/2024	Poldean East	4	24	6711	6.711	3.6
04/11/2024	Poldean West	2	12	6711	6.711	1.8
04/11/2024	Poldean	3	18	1849	1.849	9.7
05/11/2024	Three Waters Meet	2	12	1365	1.365	8.8
18/11/2024	Moffat	3	18	2238	2.238	8.0
Totals		132	**1622**	71119	71.119	**22.8**

Appendix 2

Date of Clean	Location	Bags	KG	Length Cleaned (m)	Length Cleaned (km)	Litter Density (kg/km)
18/01/2025 & 19/01/2025	Powfoot	24	166*	3141	3.141	52.8
27/01/2025 & 28/01/2025	Newbie	29	174	2170	2.17	80.2
03/02/2025	Annan	6	36	6480	6.48	5.6
04/02/2025	Brydekirk	5	30	5340	5.34	5.6
10/02/2025	Hoddom	4	24	7117	7.117	3.4
11/02/2025 & 17/02/2025	Williamwath Bridge	6	36	7634	7.634	4.7
17/02/2025 & 17/03/2025	Bengal Farm	8	48	5044	5.044	9.5
17/02/2025 & 17/03/2025	Shillahill Bridge	14	84	3800	3.8	22.1
18/02/2025	Dryfeholm	4	24	4205	4.205	5.7
24/02/2025	Millhousebridge	5	30	3205	3.205	9.4
25/02/2025	Spedlins Castle	3	18	3070	3.07	5.9
03/03/2025	Johnstonebridge	5	30	4837	4.837	6.2
04/03/2025	Wamphray	6	36	4441	4.441	8.1
10/03/2025	Poldean	7	42	6711	6.711	6.3
11/03/2025 & 18/03/2025	Three Waters Meet	12	72	1849	1.849	38.9
11/03/2025	Moffat Nature Reserve	4	24	1365	1.365	17.6
11/03/2025	Moffat	5	30	2238	2.238	13.4
Totals		147	**904**	72647	72.647	**12.4**

**includes an estimated weight of an IBC (Intermediate Bulk Container) which was collected.*