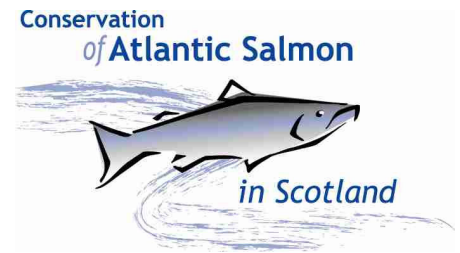


Conservation of Atlantic Salmon in Scotland

Project number: LIFE04NAT/GB/000250

After-LIFE conservation plan





After-LIFE conservation plan for the Conservation of Atlantic salmon in Scotland LIFE04NAT/GB/000250

List of Key words and Abbreviations

Keywords

Atlantic salmon

Conservation

Abbreviations

<i>EC</i>	European Commission
<i>SAC</i>	Special Area of Conservation
<i>CASS</i>	Conservation of Atlantic salmon in Scotland
<i>SNH</i>	Scottish Natural Heritage
<i>FRS</i>	Fisheries Research Service
<i>ASFB</i>	Association of District Salmon Fishery Boards
<i>DSFB</i>	District Salmon Fishery Board
<i>KoSDSFB</i>	Kyle of Sutherland District Salmon Fishery Board
<i>NDSFB</i>	Ness District Salmon Fishery Board
<i>SFB</i>	Spey Fishery Board
<i>DDSFB</i>	Dee District Salmon Fishery Board
<i>EDSFB</i>	Esk District Salmon Fishery Board
<i>TDSFB</i>	Tay District Salmon Fishery Board
<i>TF</i>	Tweed Foundation
<i>GFT</i>	Galloway Fisheries Trust
<i>BDSFB</i>	Bladnoch District Salmon Fishery Board
<i>FCS</i>	Forestry Commission Scotland
<i>SSE</i>	Scottish and Southern Energy
<i>LOPT</i>	Local Operational Planning Teams
<i>SEPA</i>	Scottish Environmental Protection Agency
<i>FWPM</i>	Freshwater Pearl Mussel

Attachments:

1. Table of After-LIFE actions and responsible partners
2. Map of project rivers and sites and potential extensions to SACs
3. List of Project partners and co-financiers

Executive Summary

The Project

Commencing in 2004, the Conservation of Atlantic Salmon in Scotland LIFE project (CASS) is the single most significant salmon conservation project ever undertaken in Scotland, with seventeen partners and nine co-financiers in addition to the European Commission. The project has significantly improved the natural freshwater habitat for salmon on 8 of the key salmon river SAC's in Scotland, which constitute approximately 38% of the Atlantic salmon resource in Scotland.

The overall objective of the project was

“to safeguard and maintain the abundance and diversity of salmon in Scotland through the significant improvement of freshwater habitats, the development of management guidelines, and the promotion and demonstration of best practice in removal of key threats through joint working and partnership.”

By project end at 31 July 2008, the key deliverables and outputs achieved were:

1. Halt the remaining commercial netting of salmon on **2** rivers
2. Remove or bypass 25 obstacles improving access for salmon to **187km** of habitat
3. Improve over **39,060m²** of freshwater habitat for spawning and juvenile salmon
4. Restock restored areas of habitat with local populations of wild salmon on **3 rivers**
5. Control grazing along **52.7 km** of river to improve river habitat and protect river banks
6. Stabilise **500m** of eroding riverbank and reduce siltation from surface runoff into two rivers
7. Extend and **diversify riparian woodland** habitat along **4** rivers
8. Provide general guidance and a local **code of practice for gravel extraction** in salmon rivers
9. **Raise awareness** of *Natura* and salmon conservation issues with river owners and the public

The After-LIFE conservation plan

Having achieved over 200 project deliverables in the 4 years of the CASS LIFE project, with the essential assistance of the 17 dedicated project partners and the various co-financiers, and the support of the EC, the project team and partners must consider how to ensure that the project achievements are maintained and that further conservation outcomes are possible once the CASS LIFE Project is complete.

To summarise, each project partner will continue to conserve Atlantic salmon and monitor the effectiveness of the CASS LIFE project actions on 8 key rivers in Scotland by:

- Site appraisals and monitoring
- Closure of netting rights and land management agreements

- Maintenance of restored connectivity of salmon habitat:
- Fencing and silt trap maintenance
- Maintenance of fish counters
- Continued management of riparian woodland
- Restocking of improved areas with local hatchery-reared salmon
- Public awareness

Site appraisals and monitoring:

Salmon population monitoring

- Monitoring of juvenile salmon will continue on all eight rivers under the guidance of the relevant District Salmon Fishery Boards and following agreed SFCC protocols.
- On the rivers Tweed, Spey, Tay and Oykel, this will be supplemented by data of adult and smolt numbers from the 6 fish counters installed as part of the CASS LIFE project,.

Habitat monitoring

- Sediment and fluvial audits will be conducted by the Esk Fishery Board 5 years after fencing has been installed. A photographic record of selected areas with severe erosion will be compiled.
- Habitat monitoring to SFCC protocol will be undertaken in areas of forest management and fencing.
- pH monitoring of the Polbae burn, River Bladnoch will be undertaken.
- SNH conducts six-yearly monitoring of Natura sites, which will provide additional site monitoring for the eight project SACs
- The results of monitoring will be reported to SNH for collation into SCM cycle.

Netting rights and land management agreements:

- On the River Bladnoch, all commercial netting has ceased, and monitoring will demonstrate the effectiveness of this on salmon populations in this River. On the River Oykel, 6 of 12 netting rights are owned or leased by the Kyle of Sutherland District Salmon Fishery Board for the purposes of conservation, 2 other netting leases are held by their respective owners and are not being used. The Board will continue to liaise with these 2 owners to ensure the netting leases remain unused.
- Land management agreements – the Rivers Dee and South Esk have land management agreements in place for 10 years, until 2018.

Maintenance of restored connectivity of salmon habitat:

- 25 obstacles to fish passage have been removed or modified to allow for the movement of salmon as part of the CASS LIFE project.
- Extensions to the SAC boundary on the Spey and Dee will be designated so as to include new stretches of river newly accessible to salmon.

- There remain obstacles to fish passage on many rivers, however legislative amendments now mean that a range of authorities are required to provide for fish passage. The relevant District salmon fishery boards will continue to work with the authorities to ensure these remaining structures are overcome appropriately.

Fencing and silt trap maintenance:

- Monitoring will determine the efficacy of fencing and grazing management of riparian buffers.
- Follow up maintenance of the fencing will be undertaken by the landholders or the relevant Fishery Board
- The benefits of fencing and riparian grazing control are already evident along the River Dee, with many landholders requesting to be involved in the scheme. The success of the programme will enable education and the formation of best-practice guidance for landholders.
- The number of silt traps on the River Dee was reduced due to the success of the fencing at controlling sediment transport from adjacent land. Ultimately only 60 silt traps were required, highlighting the efficacy of fencing not only as a way to provide a riparian buffer and exclude livestock, but also to reduce sediment input into salmon rivers.
- Silt traps will be emptied as required by land managers under the terms of their SNH management agreements?
- The national SEPA programme of water quality monitoring will provide details of sediment loadings.

Maintenance of fish counters

- Three of the fish counters are under the care of Scottish and Southern Energy for maintenance
- Two VAKI fish counters will be maintained by the Spey Fishery Board, whose staff have been trained in maintenance by VAKI
- The Tweed Foundation will maintain the third VAKI counter with assistance from the Spey Board.

Continued management of Riparian woodland:

- The monitoring and habitat surveys will determine the effectiveness of these actions on the Rivers Dee, Bladnoch, Tay and Spey.
- The water quality (pH) of the Polbae Burn, a tributary of the River Bladnoch, will be closely monitored to determine whether the forestry management here has reduced the acidity of the water.
- The habitat surveys conducted by the relevant fishery board will identify

any further areas requiring intervention. In cooperation with FCS, these areas will be assessed for any further action.

- Existing riparian coppicing and planting will require ongoing maintenance as canopy cover increases.

Restocking of improved areas with local hatchery-reared salmon:

On the rivers Bladnoch and Spey, the hatchery work will continue to restock rehabilitated areas.

Public awareness and information dissemination:

Salmon In the Classroom:

- The majority of project partners will be continuing this programme in schools within their catchment area, at least for the next few years.

Websites:

- Many project partners now have impressive websites which will continue to be developed. The CASS Project website (hosted by SNH) will continue to be functional for the next 5 years at least to enable monitoring results to be presented.

Newsletters:

- Many partners are now providing regular (monthly or bi-annual) newsletters distributed electronically. This will continue as it is an effective way to disseminate information.

Signage and interpretation boards:

- Permanent signage erected at project sites has a lifespan of 10 years. Interpretation panels are expected to last 6 years.

Liaison between river stakeholders:

- the DSFBs of the Dee, Esk, Oykel and Spey will continue to hold regular stakeholder liaison events.

Code of practice for Gravel extraction:

- The code of practice for gravel extraction was developed and launched nationally in 2008.
- Ongoing distribution and education of landholders regarding this code of practice will be conducted by SNH through it's series of Sharing Good Practice workshops, regular liaison with landholders through are officers, and through the District Salmon Fishery Boards.

Conclusion:

Monitoring

As is clearly apparent from the summary of key actions above, monitoring is the most important action for continuation after project end, and the one action that must continue for many years. Monitoring will determine the success of the project actions and will also assist with prioritisation of future actions, such as further obstacle removal, areas for in-stream restoration above former fish

passage obstacles, areas for fencing and grazing management above the former obstacles, areas for forestry or coppicing actions, or riparian vegetation restoration, and so on. Thus, monitoring must be the number one priority action for the after-LIFE conservation plan as it will determine the need for and suitability of future actions.

Maintenance works

A number of the projects require ongoing management and maintenance as well as monitoring. Fences, fish counters and fish passes may need repairs. Woodland management and silt trap maintenance will also be required. The cost of this maintenance will be met by the Fishery Boards and SSE in the main.

Knowledge transfer

The knowledge gained by the involved partners during the CASS LIFE Project will allow them to make informed and appropriate decisions regarding any future work, and may even be used to produce best-practice guidance which may in the future guide legislation and regulation for land practices adjacent to salmon rivers. The transfer of this knowledge to other DSFBs is assured by the cohesive structure of the ASFB which enables effective information transfer, arranges regular seminars and updates by way of newsletters.

The education of the local and general public has been the most enjoyable part of the CASS LIFE project, and the area all project partners will be gladly continuing. All partners have reported that the Salmon in the Classroom programme has been an effective and enjoyable way to educate the next generation about salmon conservation.

Site protection

The opening up of new stretches of river to the passage of salmon will lead to extending the boundary of the existing SACs. This will ensure that the Habitat Directive obligations will apply and that appropriate steps will be taken to avoid *“the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant”* and to ensure that *“Every competent authority in the exercise of any of their functions, shall have regard to the requirements fo the Habitats Directive so far as they may be affected by the exercise of those functions”*.

1 History

The Conservation of Atlantic Salmon in Scotland LIFE project (CASS) was the single most significant salmon conservation project ever undertaken in Scotland, with a beneficiary (Scottish Natural Heritage), seventeen project partners and nine co-financiers in addition to the European Commission. The project has significantly improved the natural freshwater habitat for salmon on 8 of the key salmon river SAC's in Scotland, which constitute approximately 38% of the Atlantic salmon resource in Scotland.

This project brought together organisations with responsibilities for much of the wild salmon resource in Scotland in a comprehensive programme of work to remove threats in freshwater. This complemented ongoing work at a national, European and international level to address threats to salmon within the marine environment.

The overall objective of the project was

“to safeguard and maintain the abundance and diversity of salmon in Scotland through the significant improvement of freshwater habitats, the development of management guidelines, and the promotion and demonstration of best practice in removal of key threats through joint working and partnership.”

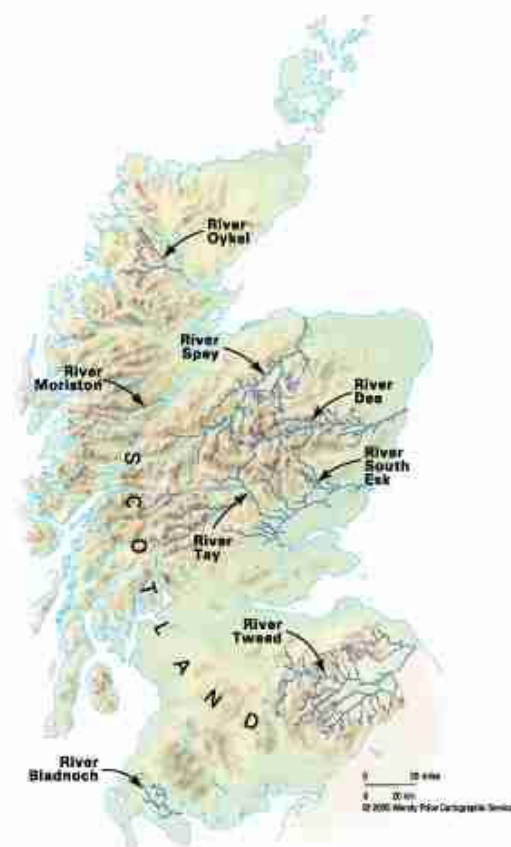


Figure 1. Map of the CASS LIFE Project rivers.

It has also produced a range of management demonstration products which will feed into wider conservation strategies for the species and guidance for application throughout Scotland and beyond

The project partners include the statutory bodies responsible for conservation of salmon stocks (District Salmon Fishery Boards), and also the public agencies responsible for population monitoring, Natura sites and species protection, natural heritage conservation and the management of forested catchment areas in public ownership. The partners provided match funding, contributed staff time and expertise, and liaised with others to share experiences and good practice.

1.1 Key deliverables and outputs achieved

1. Halt the remaining commercial netting of salmon on **2** rivers

The Bladnoch DSFB purchased a 99-year netting lease, which eliminated the only netting station at the mouth of the SAC, making the river Bladnoch entirely free from commercial Salmon netting. On the River Oykel the Kyle of Sutherland District Salmon Fishery Board (Kyle Board) secured the purchase of four, and leased the rights to one, netting stations on the Dornoch Firth, into which the River Oykel flows. This has removed 40% of the legal netting exploitation of Salmon from the area.

2. Remove or bypass 25 obstacles improving access for salmon to **187km** of habitat

The original target of 25 obstacles was met, despite some of the original actions being removed. On the river Spey Ten obstacles to fish passage were removed or bypassed. On the river Dee five obstacles were planned to be removed or bypassed however a total of seven were achieved within the original budget. On the river Moriston one obstacle, Ceannacroc heck, was modified to make the heck passable to migrating adult Salmon. On the river Oykel one obstacle was modified to allow fish passage. The river Tay actions were carried out by SSE to improve fish passage on a number of different obstacles. These include the improvement of three fish passes at hydroelectric dams and fish passes on three natural obstacles on the Lochay. The completion of the aforementioned actions improved access to 150km of habitat.

3. Improve over **39,060m²** of freshwater habitat for spawning and juvenile salmon

The final area of habitat which was improved was 70,137m², 180% of the original target. On the river Bladnoch various instream habitat improvement works were carried out including work on the Polbae dam and pipe bridge, debris removal, and boulder placement, which consequently created 31,692m² of improved habitat. Furthermore 33,420m² of improved habitat was created through the construction of rubble mats and debris removal on the river Dee.

4. Restock restored areas of habitat with local populations of wild salmon on **3 rivers**

Re-stocking was carried out on two rivers, the river Spey and the river Bladnoch. On the river Spey hatchery reared juveniles were released and eyed ova planted in 2005 and 2006 above obstacles. Eyed ova were again planted in 2007 and 2008. On tributaries of the river Bladnoch, hatchery reared Fry and eggs, stripped from natural broodstock were released and planted from 2006 to 2008.

5. Control grazing along **52.7 km** of river to improve river habitat and protect river banks

The total length of fencing achieved by the CASS project was 80.6km, 150% of the original target. This was achieved by erecting 34km of fencing on the river Dee, 6km on the river Bladnoch and 40.1km on the river South Esk. Benefits, in the form of vegetation regeneration and reduced siltation, have already been noticed in the areas where fencing has been erected.

6. Stabilise **500m** of eroding riverbank and reduce siltation from surface runoff into two rivers

Just one river was involved in addressing this threat, the river Bladnoch. Just over 500m of eroded riverbank on the river Bladnoch was repaired with rock and log revetments.

7. Extend and **diversify riparian woodland** habitat along **4** rivers

Riparian woodland on the rivers Dee, Bladnoch, Spey and Tay was addressed. On the river Dee various methods were used to diversify the woodland habitat including coppicing, vegetation control, felling respacing and restocking. Native deciduous trees were planted by GFT on 21,260m of river bank and 40ha of coniferous woodland was felled by FCS in the Bladnoch catchment to create a diverse woodland structure and improve conditions for Salmon.

8. Provide general guidance and a local **code of practice for gravel extraction** in salmon rivers

A code of practice for the river Tay and separate Scotland-wide brochures were produced and distributed as part of the CASS project.

9. **Raise awareness** of *Natura* and salmon conservation issues with river owners and the public

Raising awareness of *Natura* and Salmon conservation issues was achieved through a diverse number of activities. These included; The project website, newsletters, leaflets, production of a DVD video, media opportunities, workshops and seminars and Salmon in the Classroom. The Salmon in the Classroom programme was conducted in primary schools on seven of the eight rivers and well received all round with all project partners endeavouring to continue the programme after the project ends.

1.2 Key challenges

- Coordinating 17 project partners
- Changes to legislation during the project – introduced CAR licence requirement
- Challenging project actions requiring lengthy and protracted negotiation such as the design for the Coy Dam, the Oykel netting purchase.
- The project actions that could not be achieved – Rottal Burn, Batten Burn
- Budget management for so many project actions and partners
- Retention of project staff

2 Current situation

The CASS LIFE project commenced in February 2004, and was completed on 31 July 2008. The eight rivers in the CASS LIFE Project were all designated Special Areas of Conservation for salmon. At the time of completion, all eight Natura sites have been substantially improved in the ways detailed below:

2.1 The cessation of netting on two rivers

The River Bladnoch is now free of the last remaining commercial netting lease, which was purchased by the Bladnoch DSFB as part of the CASS LIFE Project. On the River Oykel, six netting stations were purchased through the CASS project, substantially reducing the level of commercial netting in the river. However 4 remain active.

2.2 Land management agreements

The land management agreements established during the CASS project on the rivers Dee, Esk and Bladnoch are in place for ten years. The relevant DSFBs are in the process of identifying any further opportunities for extending this program, however funding may need to be sought if further fencing work is required. The Scottish Rural Development Programme (SRDP) initiatives will be the focus of future land management initiatives.

2.3 SAC extensions through provision of fish passage

Two of the eight salmon rivers in the project (all designated Natura sites – Special Areas of Conservation) have potentially extended their boundaries due to the successful removal of obstacles to fish passage. The predicted new extents of the SACs are detailed in a series of maps at Attachment 2.

The Rivers Dee and Spey have had the most obstacles to fish passage overcome, thus their extents are much increased. The Bladnoch, Tay, Oykel and Moriston have had improvements made to the existing fish passage which will allow more salmon to reach upstream habitats. Monitoring will be able to confirm this. These areas were already passable to salmon and as such were already within the SAC boundaries.

2.4 In-stream habitat and unrestricted riparian grazing

Within the existing SAC boundaries, the in-stream habitat on the Rivers Dee and Bladnoch has been substantially improved (25,060m² on the River Dee and 36,967m² on the River Bladnoch), addressing threat 3. Fencing and controlled grazing on the Rivers Bladnoch, Dee and South Esk has addressed the threat to the rivers from sediment loads and associated degradation of in-stream spawning habitat (threat 4). Further habitat surveys will identify any further areas requiring restoration or where existing areas require further maintenance work. Monitoring of juvenile salmon populations will demonstrate the benefits of the work.

2.5 Riparian forestry management

Coppicing, felling and replanting with native mixed deciduous species has improved the riparian zones along the Rivers Dee, Spey, Bladnoch and Tay. This has reduced shading, improved conditions for the regrowth of more appropriate ground-level flora, and is anticipated to help reduce the acidity in the Polbae Burn (Bladnoch tributary). Also on the in the River Tay catchment temperature loggers have been installed on the River Errochty to monitor temperature changes brought about by recent coppicing work. Monitoring of juvenile salmon populations will demonstrate the benefits of the work

2.6 Gravel extraction code of practice

Following the report and recommendations of the fluvial audit, and consultation with river stakeholders, the River Tay Code of Practice for Gravel extraction has been completed. A national Code of Practice has been produced in conjunction with the licensing authority for in-river works, Scottish Environment Protection Agency.

2.7 Fishery Plans

Outwith the CASS project, all fisheries trusts, including the ones involved in the project have, after extensive consultation, developed fishery plans for their respective areas. These are the definitive plans to guide fishery management initiatives and monitoring.

3 Problems that remain

Identified issues remaining as threats to salmon on the 8 project rivers are listed below:

- Monitoring and habitat surveys above former obstacles to fish passage: the areas upstream of the now-bypassed obstacles to fish passage need to be assessed to determine the quality of the in-stream habitat for salmon, the threats to that habitat (sediment loads, debris, etc), the extent to which the salmon can now access the upstream areas, any further unnatural obstacles to fish passage, any threats from adjacent land-use such as forestry or agriculture or urban development, and also the need for stocking of newly opened-up areas.
- Netting – identifying any other netting stations that may be impacting the salmon on the 8 project rivers and the possibility of either obtaining them or collaborating with the lease or rights owner to cease use of the netting rights.

- Land management - identification of other areas within the existing or extended SAC requiring land management agreements to undertake riparian buffer creation and fencing of livestock.
- Riparian forestry management
- Restocking of river sections
- Publicity

While the above describes general issues that affect more than one river some of the project partners have highlighted specific problems on their own individual rivers. These problems are as follows.

River Bladnoch

Water quality, in the form of acidification of the head waters, is the remaining threat on the river Bladnoch.

River South Esk

Water quality/quantity issues emanating from:

- Agricultural diffuse pollution, especially high levels of phosphate
- Pollution from sewage effluent (septic tanks and treatment plants)
- Excessive drainage
- Abstraction for irrigation during low water flows

Reduced Biodiversity arising from:

- Canalisation of tributaries
- Spreading of non-native invasive species including American Signal Crayfish
- Hard engineering structures

Effects of forestry:

- Excessive shade and sedimentation

Exploitation

- Predation by birds and mink considered a significant issue
- Presence of a mixed-stock net fishery (As defined by the North Atlantic Salmon Conservation Organisation – NASCO) operating just to the south of the estuary (Salmon move from the South to the North, thus this intercepts fish in significant numbers prior to them reaching their rivers of origin). This may well be taking fish destined for other SAC rivers such as the Dee and Tay.

Biosecurity

- Initial consideration of biosecurity planning has stressed the danger of discharge of untreated ballast water from ships emanating from most Baltic and European ports into Montrose Harbour (South Esk estuary). This is considered an important vector for the potential introduction of non-native species such as the Chinese Mitten Crab and possibly Zebra Mussels.
- A draft biosecurity plan for the area which includes the river South Esk will be completed spring 2009

4 SWOT Analysis

<p><u>Strengths</u></p> <ul style="list-style-type: none"> • Knowledge gained by partners during the CASS project • Major infrastructure works are complete with monitoring and maintenance the primary after-LIFE commitments • Partnership working throughout the CASS project has increased knowledge transfer between partners and provides an information resource • Cohesive partnership that will continue after the CASS project ends • Strong national support from ASFB • Strong technical support form SNH • Refining of technical knowledge during the project • Experience with budgeting and resourcing actions ranging from small to large scale • Clarity over further priorities for salmon conservation 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> • Loss of knowledge through staff attrition • Lack of internal funding for key monitoring actions from partners • Potential for inadequate staffing for the carrying out of After-LIFE actions • Diverting resources to other actions unrelated to the After-LIFE plan
<p><u>Opportunities</u></p> <ul style="list-style-type: none"> • High profile of Atlantic salmon in Scotland • Public support for conservation of salmon in Scotland • Increasing awareness of fishing methods for catch and release salmon fishing • Increased awareness of anthropogenic impacts on salmon and habitats • Legislative improvements requiring landowner to improve fish passage and landholders to manage land use sustainably • Partners in better position to obtain and manage other external funding due to LIFE experience 	<p><u>Threats</u></p> <ul style="list-style-type: none"> • Lack of future funding opportunities for partners with substantial After-LIFE commitments • Impacts of climate change on salmon populations • Changes in adjacent land use • Changes to the roles and funding of SNH and the project partners • Unforeseen significant costs arising from expensive equipment or infrastructure failing

Future requirements, responsibilities, funding and proposed actions are provided in Table 1

5. Capacity Needs

The project will be handed over from the project team to the SNH Statutory Framework Unit who are responsible for advice and projects related to the birds and habitats directives. Transfer of knowledge to the new team will be carried out by a 'hand-over' briefing where the project will be discussed and responsibility handed over. The project team will also create a post-project guidance pack which will contain all information that could be needed should there be any queries or audit. The new team includes experts in conservation who have experience with LIFE projects and who would be adequately experienced to deal with any issues which may arise after the project end.

There should be no need to rely on volunteers as any work that is required can be organised by the respective Salmon fisheries boards and trusts. However with smaller fisheries trusts and boards, there would be less capacity to be able to deliver some of the actions

6. Institutional Issues

SNH is a large government agency which has capacity to manage any future work coming from this project. There are formal mechanisms already in place to ensure that monitoring results gathered by each of the fishery boards/trusts will be forwarded to SNH. SNH is required by government to monitor the status of designated sites on a regular six year cycle. These mechanisms and obligations will ensure monitoring is undertaken, collated, analysed and results made available.

7. Political Challenges

From the beginning of the CASS Life project there has been backing from ministerial level, government agencies, local authorities and fishery boards. It is anticipated that there will be continued support from all levels of authority for the conservation of Atlantic Salmon in Scotland.

8. Financial outlook

See table 1 for a detailed estimate of future financial requirements. There is a high likelihood of any future management work being eligible and a priority for funding under the Scottish Rural Development Programme as the management works would be on a designated wildlife site. Any eligible actions would be straightforward and relatively inexpensive such as fencing, and riparian woodland management. In addition the new SEPA WFD Restoration Fund is available. Examples of the types of work that can be funded include the removal of weirs or providing fish passes to overcome barriers to fish migration and the restoration of flood plains, coastal intertidal zones and wetlands. This is a high relevance to the CASS LIFE project actions. Much of the ongoing monitoring forms part of core work of the fisheries board/trust staff. It is difficult to cost this monitoring in detail but will only be between 2 – 20 days per year, depending on the river and so costs will be between £300 - 4000 per year. Maintenance costs will be low initially as the infrastructure and equipment is all new and will require regular servicing under warranty. Costs will increase over

time. The main risk will be an unforeseen major breakdown.

9. Technological Needs

With the installation of Fish counters on 3 of the CASS Life rivers, this brings with it a commitment to keep knowledge and expertise within the respective fisheries boards. To maintain the capacity to keep the counters running requires transfer of knowledge throughout the fishery board. This could be done informally by simply passing on anecdotal advice or by sending staff on official training courses ran by the fish counter manufacturers. The fish counters, themselves will need to be updated periodically as new software comes out and as advances are made which make counters more accurate.

Attachment 1.

Table 1. After-LIFE conservation plans actions, responsibilities, funding and risks

After-LIFE Action	SAC Location	Frequency	Method	Responsibility	Resourcing	Output	Funding	Estimated cost	Issues & risks	Options
Monitoring of salmon populations										
	River Dee SAC and tributaries	Annual	Electrofishing, redd counting,	Dee DSFB	Board staff	Data provided to SNH	Staff salary costs from DSFB	£9200	-	Fish counters
	River South Esk	Annual	Electrofishing	Esk DSFB	Contractor	Data provided to SNH	Staff salary costs from DSFB	£1000	Funding	Use of contractors
	River Bladnoch and tributaries	Bi-Annual	Electrofishing, smolt trap, rod catch statistics	Galloway Fisheries Trust	Trust staff	Data provided to SNH	Staff salary costs from Fishery Trust	-	Funding. Dependent on resources	Less frequent surveys. Only survey important sites.
	River Moriston	Annual	Electrofishing, smolt trap	Ness DSFB	Ness & Beaully Fisheries Trust	Data provided to SNH	Staff salary costs from DSFB	£1000	Funding	Use of contractors
	River Oykel	Annual	Electrofishing, fish counter (1)	Kyle of Sutherland DSFB	Board staff	Data provided to SNH	Staff salary costs from DSFB	£1000	Funding	Use of contractors
	River Spey	Annual	Electrofishing, smolt trap, fish counters (3)	Spey Fisheries Board	Board staff	Data provided to SNH	Staff salary costs from DSFB	£9000	Funding	Use of contractors
	River Tay	Annual	Electrofishing, fish counter (1)	Tay DSFB	Board staff	Data provided to SNH	Staff salary costs from DSFB	£1500	Funding	Use of contractors
	River Tweed	Annual	Fish counter (1)	Tweed Foundation	TF staff	Data provided to SNH	Staff salary costs from Tweed Foundation	-	VAKI counter failure	Consider Electrofishing as well.
Habitat surveys										
	River Dee	2/3 years	Riparian and in-stream assessment	Dee DSFB FCS	Board staff FCS staff	Data provided to SNH	Staff salary costs from DSFB and FCS	-	No issues	These surveys are carried out with Electrofishing surveys
	River South Esk	2/3 years	Habitat survey (SPCC)	Esk DSFB	Contractor	Data provided to SNH	Staff salary costs from DSFB	£3000	Funding.	Could be carried out at the same time as electrofishing
Sediment audit										
	River South Esk	3 yearly	As per original audit	Esk DSFB	Contractor	Data provided to SNH	Esk DSFB	£5000	Funding	External funding

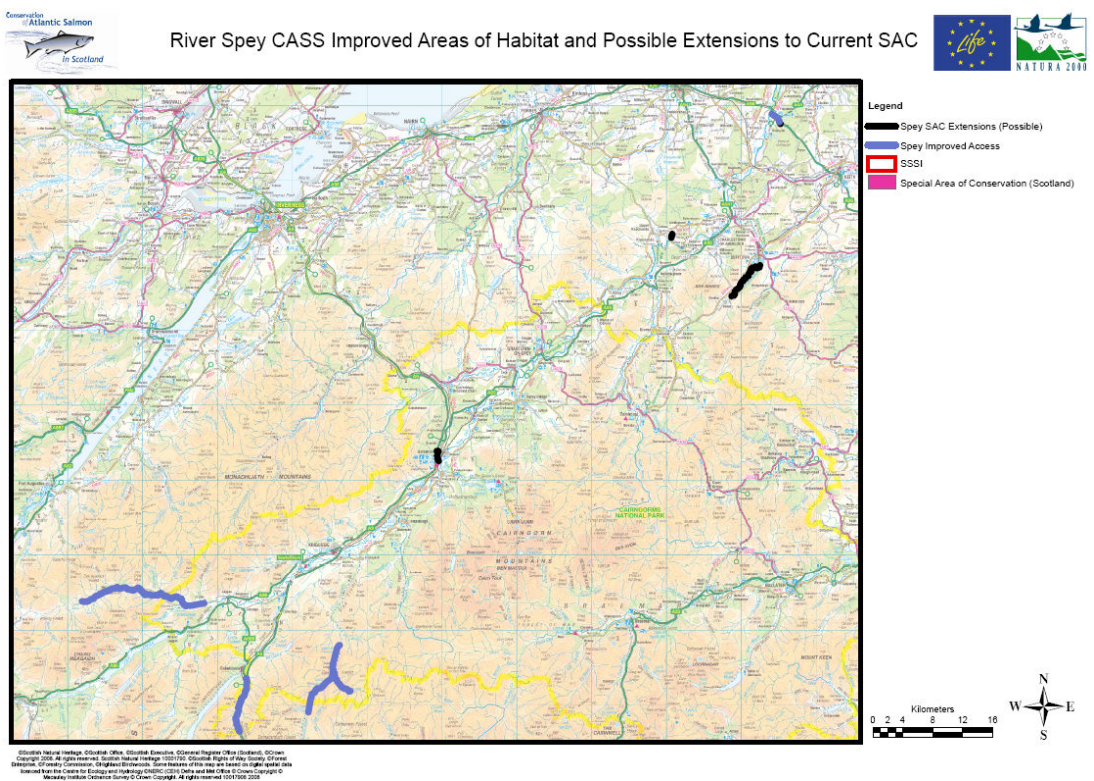
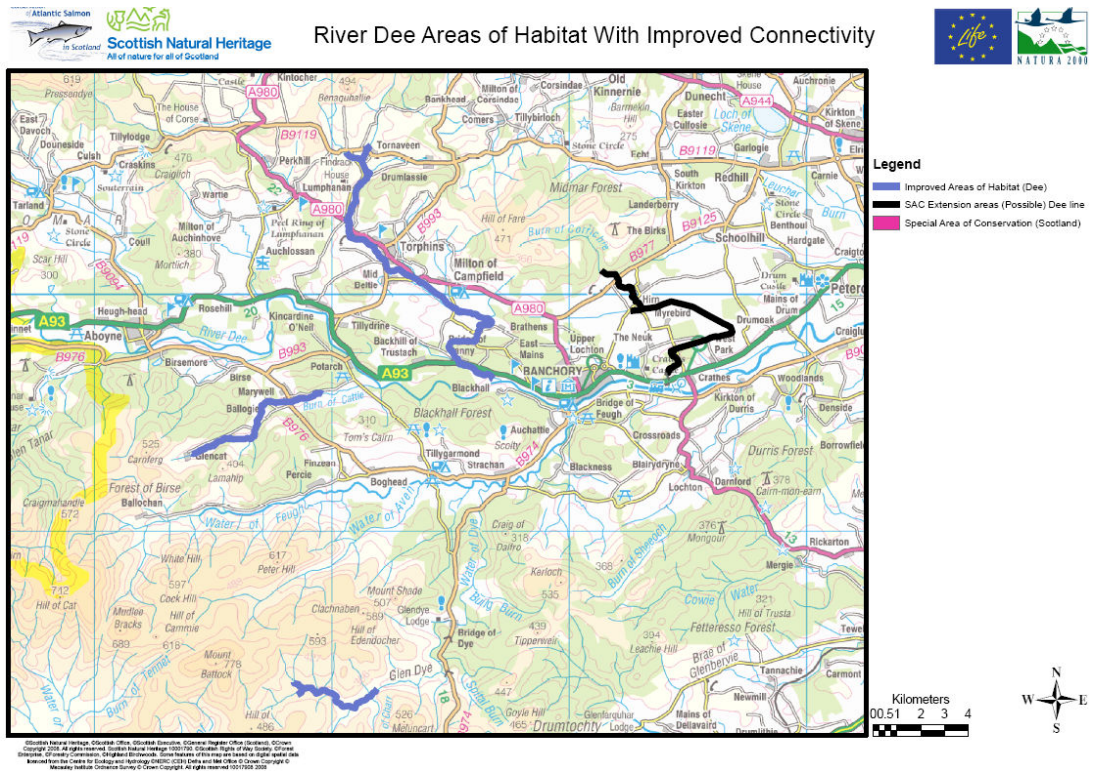
After-LIFE Action	SAC Location	Frequency	Method	Responsibility	Resourcing	Output	Funding	Estimated cost	Issues & risks	Options
Water quality monitoring										
	River Bladnoch – Polbae Burn	Annually (depending on funding)	Egg box surveys, pH measurements	Galloway Fisheries Trust	Trust staff	Data provided to SNH	Staff salary costs from DSFB	-	Highly dependent of resources and funding, difficult to estimate cost	External/Alternative funding
	River Dee	Annually	Siltation assessment	Dee DSFB	Board staff	Data provided to SNH	Staff salary costs from DSFB	£1,050	-	Use of contractor
Fencing and silt trap maintenance										
	River Dee	Annual	Landholder reporting, annual survey (fencing) Regular inspection (silt traps)	Landholder (fencing) Dee DSFB (silt traps)	Landholder, SNH staff Contractors & Board staff	Well-maintained fences for 10 years, restored riparian vegetation, reduced erosion and siltation	SNH Natural Care Agreement Scheme	?	Landholder fails to maintain fence. Emptying traps is another £30-35 per trap.	Use of SNH staff
	River South Esk	Annual	Landholder reporting, annual survey	Landholder	Landholder		Landholder	-	Flood risk area	Frequent ad-hoc checks
	River Bladnoch	Annual	Landholder reporting, annual survey	GFT	Trust staff		GFT	£1600	Flood damage	Frequent ad-hoc checks
Fish counter maintenance										
	River Oykel (1 counter)	As required	As per assessed need	SSE	Contractor	Data provided to SNH	Staff salary costs from SSE	-	Reliant on contractor expertise	In-house fish counter technician
	River Spey (3 counters)	As required	As per assessed need	Spey Fisheries Board	Board staff	Data provided to SNH	Staff salary costs from DSFB	-	Knowledgeable staff leave	Transfer of knowledge prior to staff leaving; training by VAKI
	River Tay (1 counter)	As required	As per assessed need	SSE	Contractor	Data provided to SNH	Staff salary costs from SSE	-	Reliant on contractor expertise	In-house fish counter technician
	River Tweed (1 counter)	As required	As per assessed need	Tweed Foundation	TF staff	Data provided to SNH	Staff salary costs from Tweed Foundation	-	Knowledgeable staff leave	Transfer of knowledge prior to staff leaving; training by VAKI
Fish Pass Maintenance										
River Dee (3 passes for maintenance)										
	Coy Dam (Crathes Castle)	As required	As per assessed need	National Trust of Scotland	Contractor	Maintained fish passage	DSFB	£300	Vandalism of pass.	Maintenance on ad-hoc basis
	Dye Dams 1 and 2	As required	As per assessed need	Scottish Water	Contractor	Both Dye dams will be removed once water abstraction ceases	DSFB	£300	-	Maintenance on ad-hoc basis.

After-LIFE Action	SAC Location	Frequency	Method	Responsibility	Resourcing	Output	Funding	Estimated cost	Issues & risks	Options
	River Moriston - Ceanacroc heck	As required	As per assessed need	Scottish and Southern Energy	Contractor	Maintained fish passage	SSE	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	River Oykel Duchally Dam	As required	As per assessed need	Scottish and Southern Energy	Contractor	Maintained fish passage	SSE	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	River Spey (11 passes) Spey Dam	As required	As per assessed need	Alcan	Contractor	Maintained fish passage	Alcan	-	Fish ladder too turbulent. Will probably be removed	Maintenance on ad-hoc basis
	Mortlach distillery weirs and passes	As required	As per assessed need	Diageo	Contractor	Maintained fish passage	Diageo	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	Truim weir and smolt screens, Tromie smolt curtain	As required	As per assessed need	Scottish and Southern Energy	Contractor	Maintained fish passage	SSE	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	Milton Burn culvert	As required	As per assessed need	Transport Scotland	Contractor	Maintained fish passage	Transport Scotland	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	Rothiemurchus smolt screens	As required	As per assessed need	Rothiemurchus Fish Farm	Contractor	Maintained fish passage	Rothiemurchus fish farm	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	Ballintomb Burn culvert	As required	As per assessed need	Moray Council	Contractor	Maintained fish passage	Moray Council	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	Fochabers Burn culvert 1	As required	As per assessed need	Crown Estate	Contractor	Maintained fish passage	Crown Estate	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	Fochavers Burn culvert 2	As required	As per assessed need	Moray Council	Contractor	Maintained fish passage	Moray Council	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis
	River Tay (3 passes)	As required	As per assessed need	Scottish and Southern Energy	Contractor	Maintained fish passage	SSE	-	Reliant on regular checks to initiate maintenance.	Maintenance on ad-hoc basis

After-LIFE Action	SAC Location	Frequency	Method	Responsibility	Resourcing	Output	Funding	Estimated cost	Issues & risks	Options
	River Bladnoch - Polbae dam - Pipe bridge	As required	As per assessed need	Galloway Fisheries Trust	Contractor	Maintained fish passage	GFT	£400 annually	-	Could be carried out only when needed.
Coppicing/Forestry maintenance										
	River Dee	Annual	Assess and manage as required	FCS Dee DSFB	FCS staff Dee Board staff	Woodland managed on rotation	FCS/DSFB staff costs	£8000 (DeeDSFB)	-	6km per year. Possible new project.
	River Bladnoch	Annual	Assess and manage as required	FCS	FCS staff or contractors	Woodland management plan	FCS/DSFB staff costs	Only when required difficult to estimate	Staff resources	External contractors
	River Spey	Annual	Assess and manage as required	FCS	FCS staff or contractors	Woodland management plan	FCS/DSFB staff costs	Only when required difficult to estimate	-	External contractors
	River Tay	Annual check	Assess and manage as required	Tay DSFB	Board staff	Woodland management plan	DSFB staff costs	£3000	Staff resources	External contractors
Restocking of improved areas										
	River Bladnoch	Annual	Hatchery reared juveniles	GFT/BDSFB	BDSFB	Increased numbers of juveniles	BDSFB	£6000	-	Will stop once natural spawning starts
	River Spey					No commitment				
Public awareness and information dissemination										
Project Website	SNH website	Annual	Incorporate into SNH website management	SNH	SNH staff web designers	Updated website with monitoring data included	SNH	-	Reliance on partners for updates on rivers.	
Salmon in the Classroom										
	River Dee	Annual	Standardised teaching resource available	Dee DSFB	DSFB	School visits	DSFB	£2800	Schools find difficult with travel costs	Funding support provided
	River Bladnoch	Annual	Standardised teaching resource available	GFT	GFT	School visits	GFT	£500	Schools find difficult with travel costs	Funding support provided
	River Moriston	Annual	Standardised teaching resource available	Ness DSFB	DSFB	School visits	Ness DSFB	£500	Schools find difficult with travel costs	Funding support provided
	River South Esk	Annual	Standardised teaching resource available	Ness DSFB	SNH/DSFB/AC	School visits	Ness DSFB	£2000	Schools find difficult with travel costs	Funding support provided

After-LIFE Action	SAC Location	Frequency	Method	Responsibility	Resourcing	Output	Funding	Estimated cost	Issues & risks	Options
	River Oykel	Annual	Standardised teaching resource available	KoS DSFB	DSFB	School visits	KoS DSFB	£500	Schools find difficult with travel costs	Funding support provided
	River Spey	Annual	Standardised teaching resource available	SFB	DSFB	School visits	SFB	£3000	Schools find difficult with travel costs	Funding support provided
	River Tay	Annual	Standardised teaching resource available	SNH/DSFB/Perth & Kinross Council	SNH/DSFB/PKC	School visits	SNH/DSFB/Perth & Kinross Council	£6000	Schools find difficult with travel costs	Funding support provided
Newsletters on Salmon Conservation										
	River Dee	Variable but minimum Annual	Circulation to key stakeholders and riparian owners	Dee DSFB	Dee DSFB	Newsletter – electronic and hard copy	Dee DSFB	£500	Frequency of newsletters at busy periods	Tours of sites included
	River Spey	Variable but minimum Annual	Circulation to key stakeholders and riparian owners	Spey DSFB	Spey DSFB	Newsletter – electronic and hard copy	Spey DSFB	£500	Frequency of newsletters at busy periods	Website updates
	River Bladnoch	Variable but minimum Annual	Circulation to key stakeholders and riparian owners	GFT	GFT	Newsletter – electronic and hard copy	GFT	£500	Frequency of newsletters at busy periods	Website updates
	River Oykel	Variable but minimum Annual	Circulation to key stakeholders and riparian owners	KoS DSFB	KoS DSFB	Newsletter – electronic and hard copy	KoS DSFB	£1500	Frequency of newsletters at busy periods	Website updates
Code of Practice on Gravel extraction										
	River Tay and Scotland	Ongoing	Distribution to stakeholders involved	SNH, ASFB, SEPA		Distribution of Gravel CoP	SNH	£1000	Make sure electronic version is promoted effectively	Distribution via email or website

Attachment 2. Maps showing possible extensions to SAC boundaries



Attachment 3. Project Partners & Co-financiers

Partners

Scottish Natural Heritage
The Association of Salmon Fishery Boards
Esk District Salmon Fishery Board
Tay District Salmon Fishery Board
Kyle of Sutherland District Salmon Fishery Board
Dee District Salmon Fishery Board
Spey District Salmon Fishery Board
Ness District Salmon Fishery Board
Bladnoch District Salmon Fishery Board
The Tweed Foundation
Galloway Fisheries Trust
Freshwater Research Services Freshwater Laboratory
Forestry Commission (Scotland)
Scottish Government (Formerly Scottish Executive)
Scottish and Southern Energy plc
The Crown Estate
Moray Council
Transport Scotland

Co-financiers

Inverness and Nairn Enterprise
Middle Dee Project
Carron Proprietors Association and the Laggan Fishings
Mr Christopher Martin
Alcan
Diageo
Rothiemurcus Estate