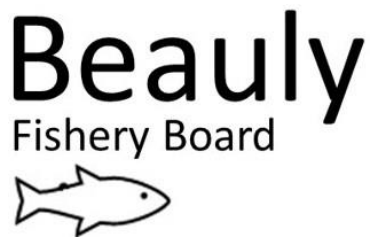


Beauly Catchment Fishery Management Plan 2022-2027



CONTENTS

FOREWORD

1. INTRODUCTION

2. CONTEXT

3. THE CATCHMENT

3.1 Beaully

3.2 Farrar

3.3 Glass (including Affric and Cannich)

3.4 The Beaully Firth

3.5 Hydro

3.6 Fish

4. INFORMATION SOURCES

4.1 2021 Electro-fishing Data

4.2 Fish Counts

4.3 Rod Catch

4.31 Conservation status

4.4 Local, National and Moray-Firth wide projects

5. THE PRESSURES

5.1 Climate Change

5.2 Loss of Riparian vegetation (lack of nutrients)

5.3 Estuarine netting

5.4 Illegal Exploitation

5.5 Smolt passage

5.6 Hydro-morphology

5.7 Predation

5.8 Angling

5.9 Other pressures

6. BEAULY FISHERY BOARD PRINCIPLES

7. PEOPLE: COMMUNITY ENGAGEMENT, PARTICIPATION AND HERITAGE

8. MONITORING METHODS

9. WORK PLAN

10. PARTNER ORGANISATIONS AND GROUPS

- 10.1 Fishery Management Scotland
- 10.2 Scottish and Southern Energy
- 10.3 Scottish Environment Protection Agency
- 10.4 NatureScot
- 10.5 Marine Scotland
- 10.6 Neighbouring Fishery Boards and Trusts
- 10.7 Highland Environment Forum
- 10.8 OurSeas
- 10.9 Highland Council
- 10.10 Trees for Life and Riverwoods initiative
- 10.11 Proprietors

11. REFERENCES

APPENDIX 1 Data to Illustrate Relative Pressures Graph

APPENDIX 2 Known Locations of Invasive Non-Native plants

FOREWORD

“It is with great pleasure that I introduce you to our Fisheries Management Plan for 2022-27 that has been produced by our Senior Biologist, Ruth Watts. This key document sets out how over the next five years the Beauly Fishery Board is going to monitor, manage and protect our salmon stocks. This plan builds on previous plans and is ambitious in its outcomes. In 2021 we commenced smolt monitoring to inform SSE’s management of flows in the catchment for improved smolt passage down the river and we hope to build on this in future years.

I would like to thank our hard-working team consisting of the Senior Biologist, the Fisheries Officer and seasonal staff, together with all the volunteers who help them.

We work closely with all parties and partners who share an interest in fisheries management in the Beauly catchment. We greatly value and seek the support of the community from schools, families, and businesses to the landowners, fishery proprietors, their employees and their fishing guests through engagement, education and communication.

The best interests of the River Beauly and its tributaries are key to us all.”

Frank Spencer-Nairn (Chairman of Beauly Fishery Board)



**Frank Spencer- Nairn
Chairman**



**Mike Spencer-Nairn
Deputy chair**



**Alastair Campbell
Clerk to the Board**



**Ruth Watts
Senior Biologist**



**Ali Skinner
Fisheries Officer**

1. INTRODUCTION

This Fishery Management Plan (FMP) takes a catchment-based approach and outlines the main pressures that Atlantic salmon and sea trout face and our plan to address these pressures in the Beaully catchment. This plan follows on from the previous [Fishery Management Plan 2014-2020](#) and background information can be viewed in that document.

The Beaully Fishery Board (BFB) takes an evidence-based approach to make good management decisions and recognises that information comes from not only practical scientific study but a wide range of sources including those who have lived their lives close to the river.

Our statutory aim as a fishery board is to protect and improve the salmon and sea trout fishery ([Salmon and Freshwater Fisheries Act 2003](#)). BFB see fish in the context of the river and catchment as a whole. Fish need clean, cold water to be able to **breath**, they need a range of substrate to be able to **live** their various life stages, and they need natural nutrient levels and riparian vegetation so they can **feed**.

Our Aims:

- Maintain or increase the density and distribution of juvenile salmonid populations
- Stabilisation of the number of resident or returning adults
- Maintain or increase the socio-economic value of fisheries in the Beaully district

BFB will do this through information gathering, assessment of the key pressures faced by salmonids and delivery of actions to reduce these pressures. The main focus is on improving degraded habitat and fish passage, whilst protecting the genetic integrity of fish in the catchment so they can adapt to the rapidly changing environment.

Broad action themes are covered under '5. THE PRESSURES' and specific planned work to tackle the pressures are tabled under '9. WORK PLAN'. This plan will be reviewed annually, with a full review due by the end of 2025.

All references to "salmon" refer to the Atlantic salmon (*Salmo salar*), and references to "trout" refer to both Brown trout and sea trout (*Salmo trutta*).

Specifically, our main work areas over the next few years include:

- Maintaining a strong bailiffing presence
- Assessing fish habitat in relation to hydro dams to see if there is an impact on the availability of spawning substrate with a view to better sediment management and habitat restoration if necessary
- Continuing smolt monitoring to inform regulated flows for better smolt survival plus conduct a smolt study in relation to the dams
- Encouraging riparian tree planting at the top of the catchment for climate change resilience

2. CONTEXT

This Fishery Management Plan aligns with international and national guidance.

Table 1: International (NASCO) and national (Scottish Government) guidance summary.	
The North Atlantic Salmon Conservation organization (NASCO) , the international organisation who protect Atlantic salmon	Scottish Government Wild Salmon Strategy [11]: Themes for Action
Managers and conservation organisations need to promote strong, healthy, and resilient populations of local wild salmonids in rivers and estuaries in order to reduce the impacts of changing ecosystems. A primary strategy to achieve this is protecting the genetic integrity of stocks, enhanced water quality and habitat protection including improving access for salmon to important habitats, and minimizing human impacts reducing growth and survival in rivers and coastal areas.	Improving the condition of rivers and giving salmon free access to cold, clean water
In the face of a rapidly changing environment, management approaches and decision-making should be broadened to include ecosystem protection of rivers, estuaries and marine environments including water quality, habitat quality and other valued components of the ecosystem.	Managing exploitation through effective regulation, deterrents, and enforcement
Agencies, managers and conservation organizations considering introductions or managing invasive species should consider the following principles: a. Discourage any introduction, intentional or otherwise, of non-native species into salmon rivers; b. If established, invasive species should be eradicated where possible, and prevented from spreading when eradication is not feasible; c. Work with other organizations to ensure strong and healthy populations of local Atlantic salmon to mitigate the potential impacts of invasive species.	Understanding and mitigating pressures in the marine and coastal environment
To optimize species productivity under future conditions fisheries managers and conservation organizations should ensure the highest number of wild smolts in the best condition leave from rivers and near-coastal areas to the ocean.	Making a positive contribution through international collaborations
	Developing a modernised and fit for purpose policy framework

Membership and close co-operation with our representative body Fisheries Management Scotland (FMS) will be maintained so that our local activities are in line with, and influence wider government policy.

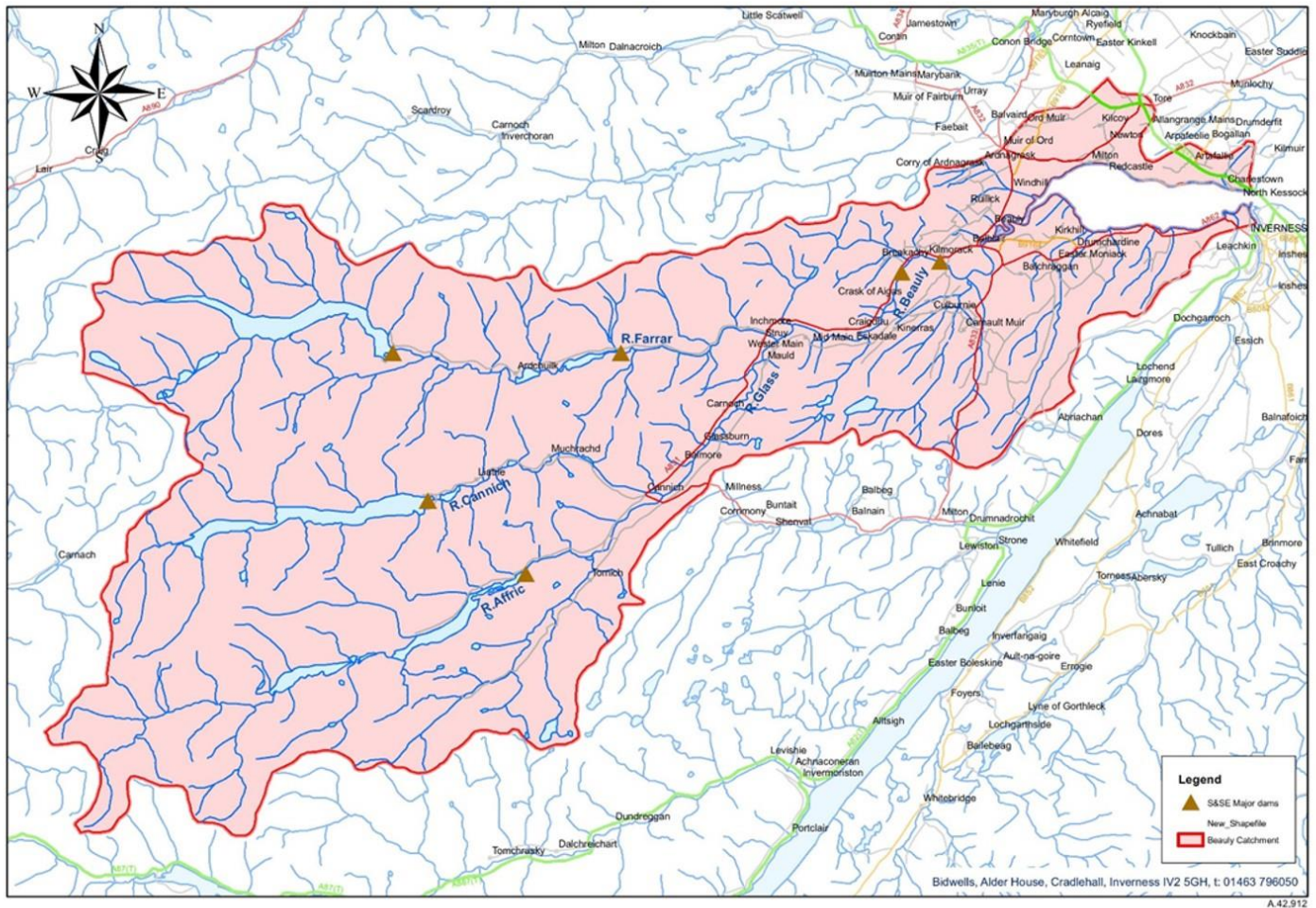
Apart from the Beaully District Salmon Fishery Board, a range of organisations have a part to play in managing the catchment. This plan is designed to link with other existing management plans. See Section 10 PARTNER ORGANISATIONS AND GROUPS.

Landowners and proprietors are key in delivering many of the aims of this FMP as well as farmers and other individuals/ community groups and it is through our relationships with them and wider stakeholders that we can make things happen (often in partnership).

3. THE CATCHMENT

The River Beauly has an approximate catchment area of 1000km² and 120km of accessible reach. The R. Beauly has two main tributaries naturally accessible to salmon and sea trout, they are the R. Farrar and the R. Glass.

Figure 1: Overview map of the catchment.



The catchment can be broadly split into four main management units.

3.1 Beauly

The R. Beauly is host to two large hydro dams (Kilmorack and Aigas), both allow fish passage via Borland fish lifts. The majority of the angling happens on the River Beauly below Kilmorack dam. The Beauly's main tributary is the Belladrum burn which has a rich geology compared with the rest of the catchment and hosts both excellent numbers of juvenile salmon as well as trout. The Belladrum sub-catchment is one of the main spawning areas for sea trout (as well as small coastal burns).

3.2 Farrar

The R. Farrar is one of the two main tributaries of the R. Beauly. The Farrar is host to Beannacharan dam which is equipped with a Borland fish lift. Numerous hydro abstractions are present on the R.

Farrar’s tributaries. The U. Misge is the R. Farrar’s main tributary. Loch Monar (a large hydro loch) at the top of the Glen Strathfarrar provides water for the R. Farrar.

3.3 Glass (including Affric, Cannich)

The R. Glass is the other of two main tributaries of the R. Beaully, with the majority of the potential spawning habitat for the catchment. The main proprietor for this section is the Glass syndicate. At the top of the R. Glass is the Abhainn Deabhag above the confluence with the R. Affric. The A. Deabhag contains excellent juvenile habitat. The Rivers Affric and Cannich are tributaries of the R. Glass. Both have natural barriers close to the confluence with the mainstem Glass making them largely inaccessible to migratory fish. Both host large hydro lochs (Loch Beinn a’ Mheadhoin and Loch Mullardoch) respectively.

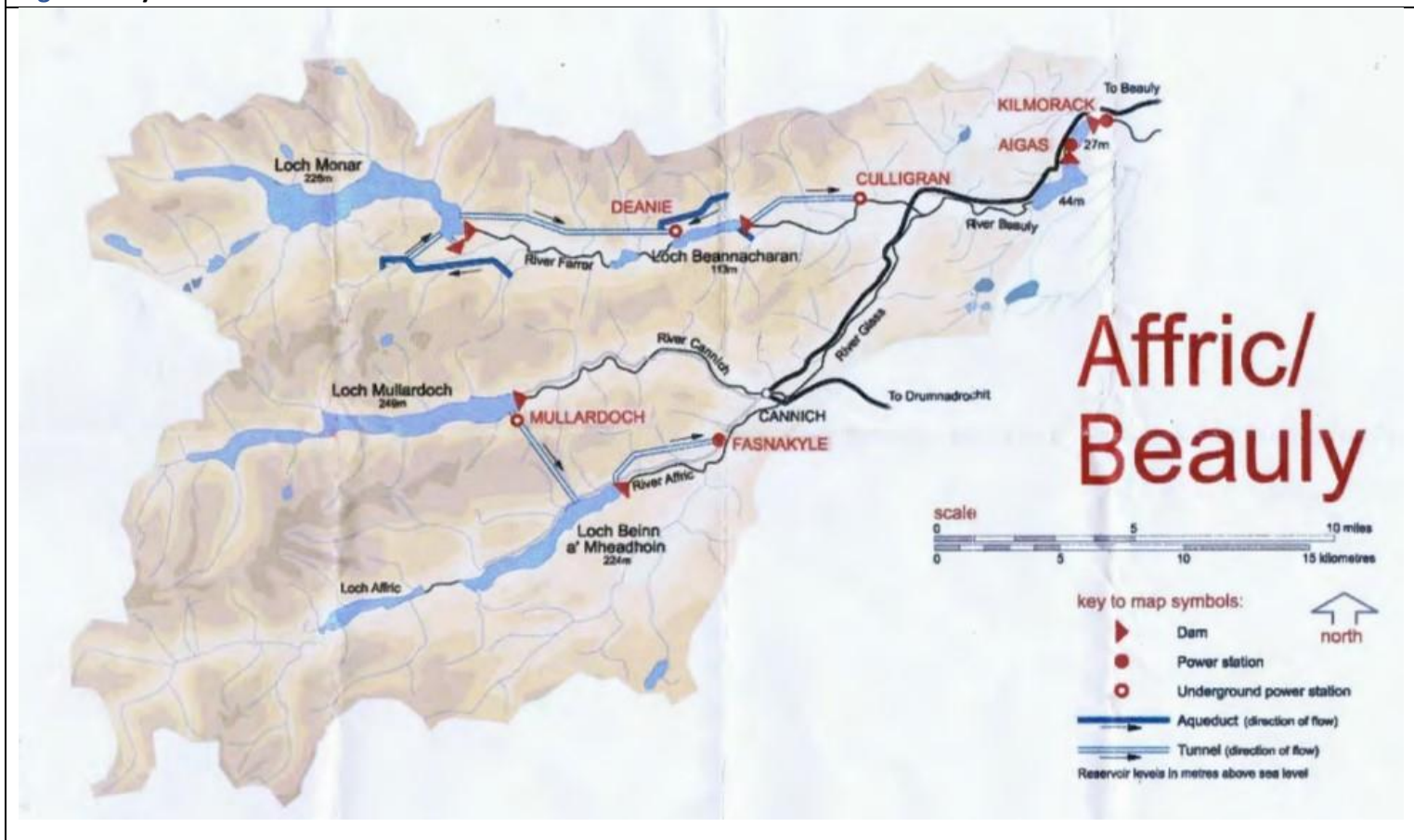
3.4 The Beaully Firth

The Beaully Firth hosts several coastal burns suitable for sea trout, and despite their size are extremely important for the sea trout who spawn there. Key burns include: Bunchrew burn, Kirkton burn, Moniack burn, Bridgend burn, Tomich burn and Redcastle burn.

3.5 Hydro

The Beaully catchment is host to hydro infrastructure, schemes built 1951-1963. Three dams with Borland fish lifts (Kilmorack, Aigas, and Beannacharan) are present in the accessible reach to migratory fish, with storage dams present at the top of the Farrar (Monar), Cannich (Mullardoch) and Affric (Beinn a’ Mheadhoin).

Figure 2: Hydro infrastructure across the catchment



3.6 Fish

The catchment hosts juvenile and adult Atlantic salmon *Salmo salar*, Brown trout and sea trout *Salmo trutta*, eels *Anguilla anguilla*, 3-spined stickle back *Gasterosteus aculeatus*, Brook lamprey *Lampetra planeri*, River lamprey *Lampetra fluviatilis* and Sea lamprey *Petromyzon marinus*. It is not clear whether Pike *Esox lucius* are indigenous to the catchment. Being north of the Great Glen they may have been introduced. Minnows *Phoxinus phoxinus* are an invasive non-native species but occur throughout the catchment. Charr *Salvelinus alpinus* originally occurred in Loch Bruicheach and Loch Sealbhanach, and Perch *Perca fluviatilis* (introduced) are thought to occur in a few small periphery lochans. Other non-native fish species (e.g. Carp, rudd, roach) occur in stocked ponds.

See the previous [Fishery Management Plan \[2\]](#) for more detailed catchment information



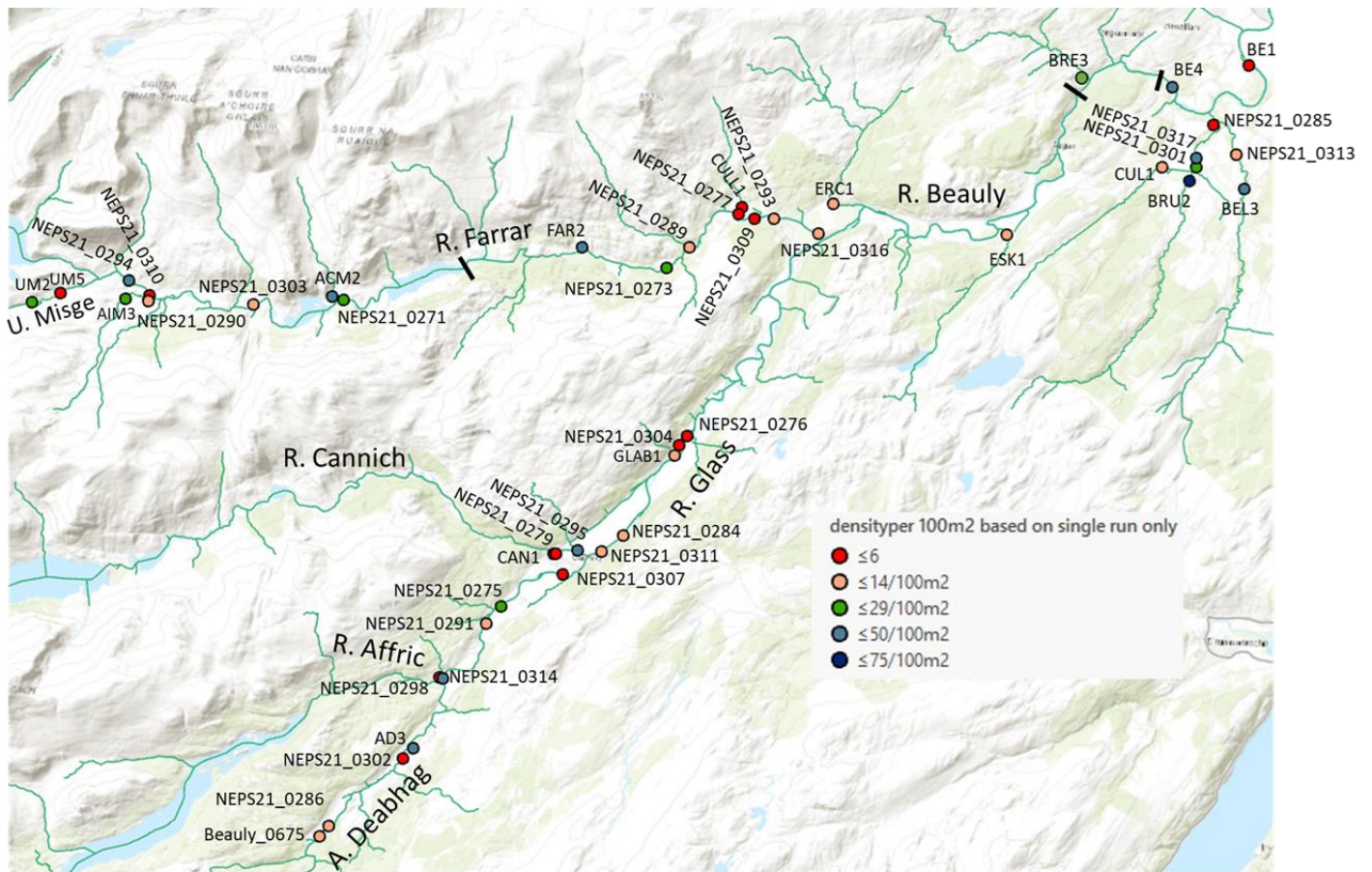
Adult River Lamprey caught on Bruaich burn during a 2021 Electro-fishing survey

4. INFORMATION SOURCES

4.1 2021 Electro-fishing Data

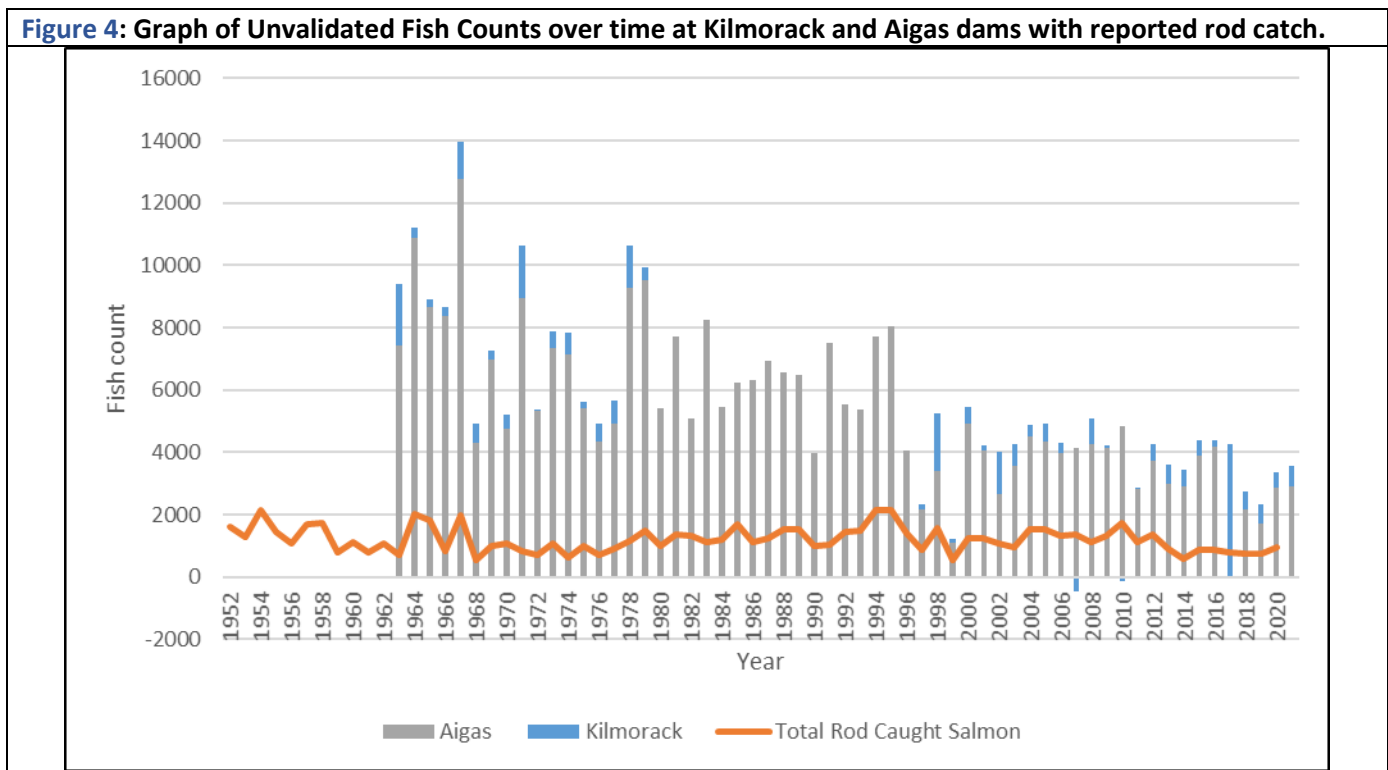
Electro-fishing surveys are carried out annually. In 2021 the most comprehensive survey of the catchment was carried out with 48 sites being visited, spread out across the catchment (a mixture of National Electro-fishing sites and Historic site re-visits). For the first time insight was gained into juvenile fish densities on the mainstem Glass. Salmon fry densities were on average the highest compared to the other management units. Electro-fishing is an extremely useful tool to show how fish are using the catchment, it can highlight problems and identify trends. Fish survey results can make a good starting point for wider conversations about the river and providing evidence to justify and monitor the effect of responsible management actions. See [2021 Electro-fishing Report \[20\]](#) for more information. Recommendations made in that report are included in this FMP.

Figure 3: Map of Atlantic salmon parr minimum densities per 100m² (2021 NEPs and historic sites). Categories based on Natural breaks (Jenks). Green category includes catchment mean for 2021.



4.2 Fish Counts

At each of the hydro dams in the accessible reach (Kilmorack, Aigas, Beannacharan) a fish counter is installed. These fish counters are there for the purposes of showing SEPA that SSE are meeting their fish passage obligations however this data is also useful to BFB and wider stakeholders as the fish counts show trends in adult fish returning to the catchment. This is especially true at Kilmorack dam as the dam is just 5.5km above the Normal Tidal Limit. Over the years, the model of counters has changed with varying count accuracy. Currently the Mark 12s are in place, and based on SSE observations at Pitlochry, efficiency is thought to be between 65-75%. An Artificial Intelligence counter and a Mark 14 counter are being trialled. Taking account of the varying efficiencies of the fish counters, there is a downward trend in returning adult salmon numbers. Evidence from [ICES](#), NASCO and a network of index sites across Scotland and the UK shows us that this is mostly due to reduced sea survival, although there are other factors at play too.



To understand better what is happening with adult salmon return, we will work alongside SSE whilst they improve the accuracy of the fish counters.

4.3 Rod Catch

Rod catch can help to show what’s going on in the catchment if reporting is accurate and angling effort and fishing conditions are taken into account. Angler observations (e.g. fish condition, presence of sea lice, predation marks, netting marks) can be useful in highlighting potential issues and patterns in the adult fish return. See [Figures 5A](#) and [5B](#).

Figure 5A : Graph of historical Atlantic salmon rod catch for the Beauly catchment.

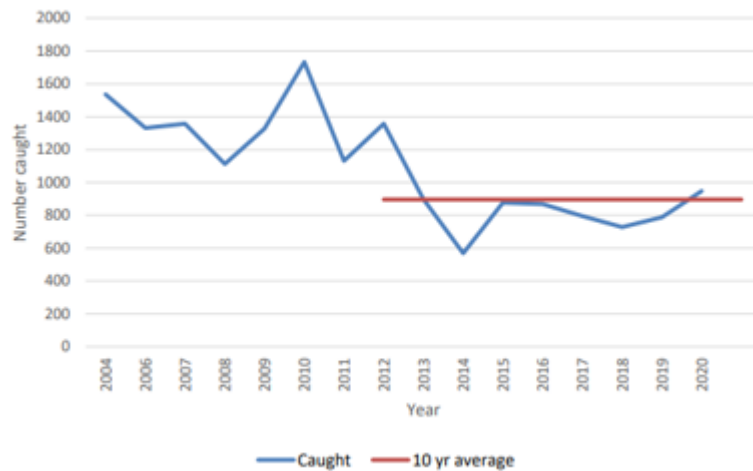
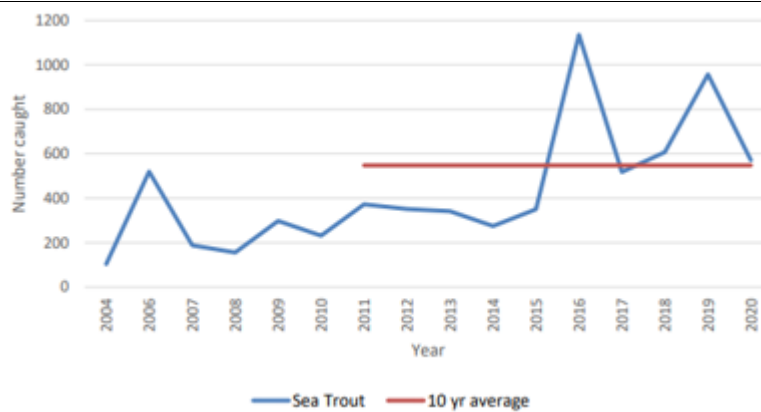


Figure 5B: Graph of historical sea trout rod catch for the Beauly catchment.

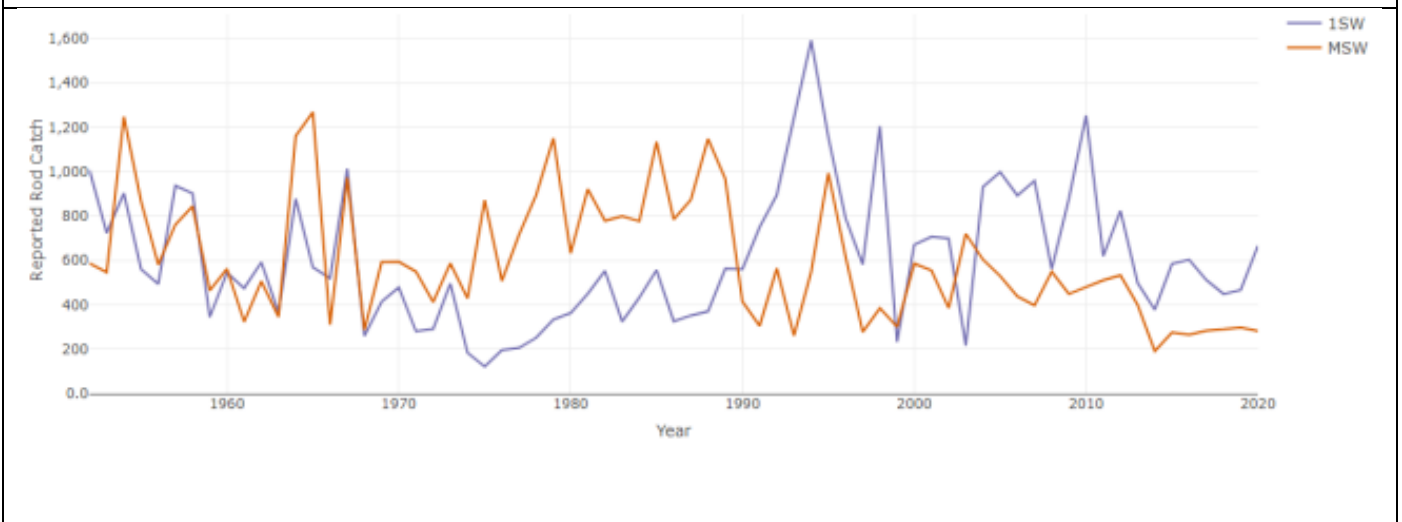


It is important that end of season angling returns are shared with board staff (via the Clerk) so that information such as weight, condition of fish, patterns in catch etc are available, and the value of this information maximised.

Adult scale reading can provide valuable information about individual life histories of Beauly fish and the population as a whole i.e. How are the sizes of grilse and multi-sea-winter (MSW) fish changing? We intend to participate in any national scale sampling and/ or genetics projects. The board in partnership with the Lower Beauly Fishing Syndicate participated in the National adult sampling project in 2021 and 2022 and hope to build on this in the coming years.

Salmon return age is partly determined by genetics, partly determined by the size fish leave the freshwater environment as smolts, and there are also natural cycles in fish return and timing of return based on the [North Atlantic Oscillation](#). Reductions in food availability at sea will likely result in an increase of MSW fish returning to the Beaully, and they are likely to be smaller than in the past [24]. See Figure 6.

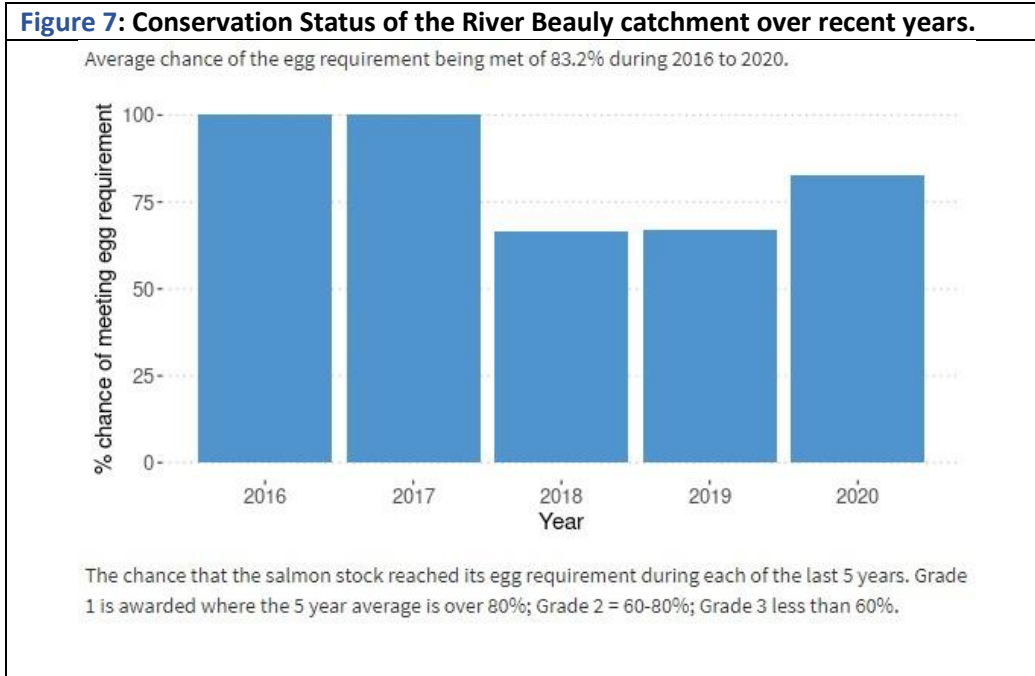
Figure 6: Rod catch by age over time for the Beaully Catchment (1SW=1 sea winter, MSW=Multi sea winter). Marine Scotland. 2021. Salmon and Sea Trout fishery statistics: 2020 season- reported catch and effort by method. DOI:10.7489/12373-1.



4.31 Conservation Status

Setting Conservation Limits is a basic requirement under NASCO. Marine Scotland (on behalf of Scottish government) use a combination of rod catch and dam count data to calculate the chance of the Beaully meeting its egg target based on available habitat. In 2021 and 2022 the Beaully had >80% chance of meeting its egg target/ conservation limit and is categorised as a Grade 1 river (good).

Figure 7: Conservation Status of the River Beaully catchment over recent years.

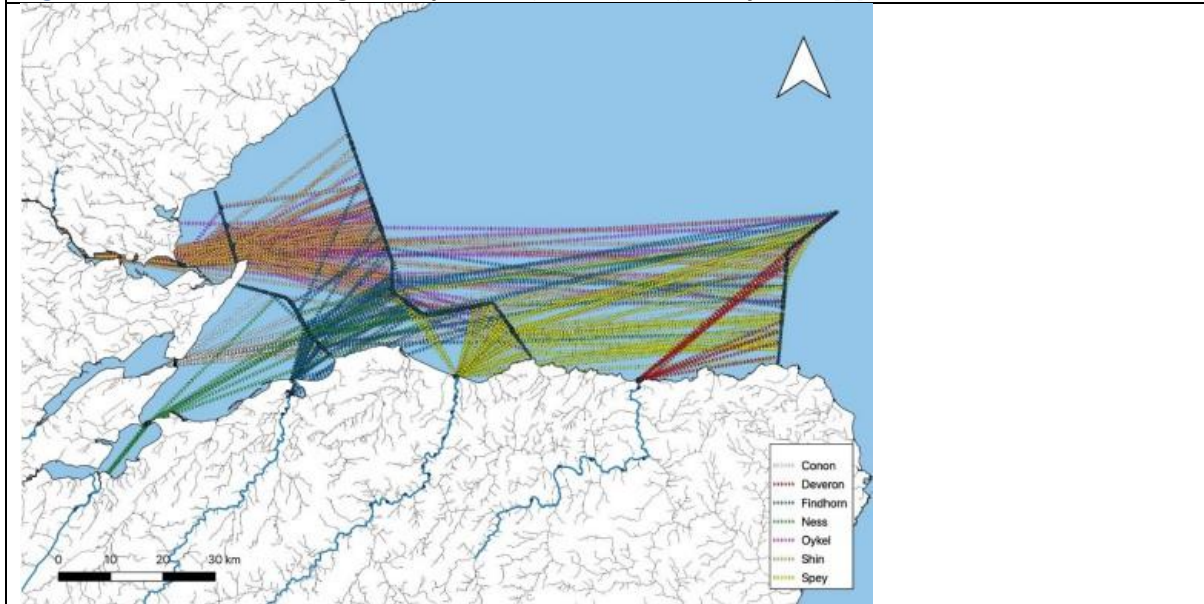


The conservation status informs BFB's Conservation Policy which includes catch and release (see section 5.7 Angling).

4.4 Local, National and Moray-Firth wide projects

2021 saw the BFB embark on smolt monitoring to help improve smolt survival (further information in section 5.5 Smolt passage), however national and Moray-Firth wide projects can really improve understanding of salmon and sea trout ecology, behaviour and pressures. For example the Missing Salmon Alliance- Moray Firth Tracking Project [3]- highlighted that the majority of smolts from the neighbouring Ness and Conon travel East and North-Eastwards towards Fraserburgh (before heading north (Figure 8)).

Figure 8: Salmon smolt migration pattern (AST, SCENE) study 2019 [3].



Recent, national, funded projects e.g. the [National Adult Sampling Project](#), [National Electro-fishing Programme](#), National Introgression Programme (See section 8. Monitoring) allows BFB to learn more than before about the salmonids of the Beaully catchment whilst answering some of the more specific questions BFB have. For example, The National Adult Sampling pilot project in 2021 highlighted that salmon returning to the Moray Firth (despite being among some of the biggest fish returning to Scotland) are generally getting smaller and lighter in the months July-September, with significant size overlap between 1 sea winter (grilse) and 2 sea winter fish.

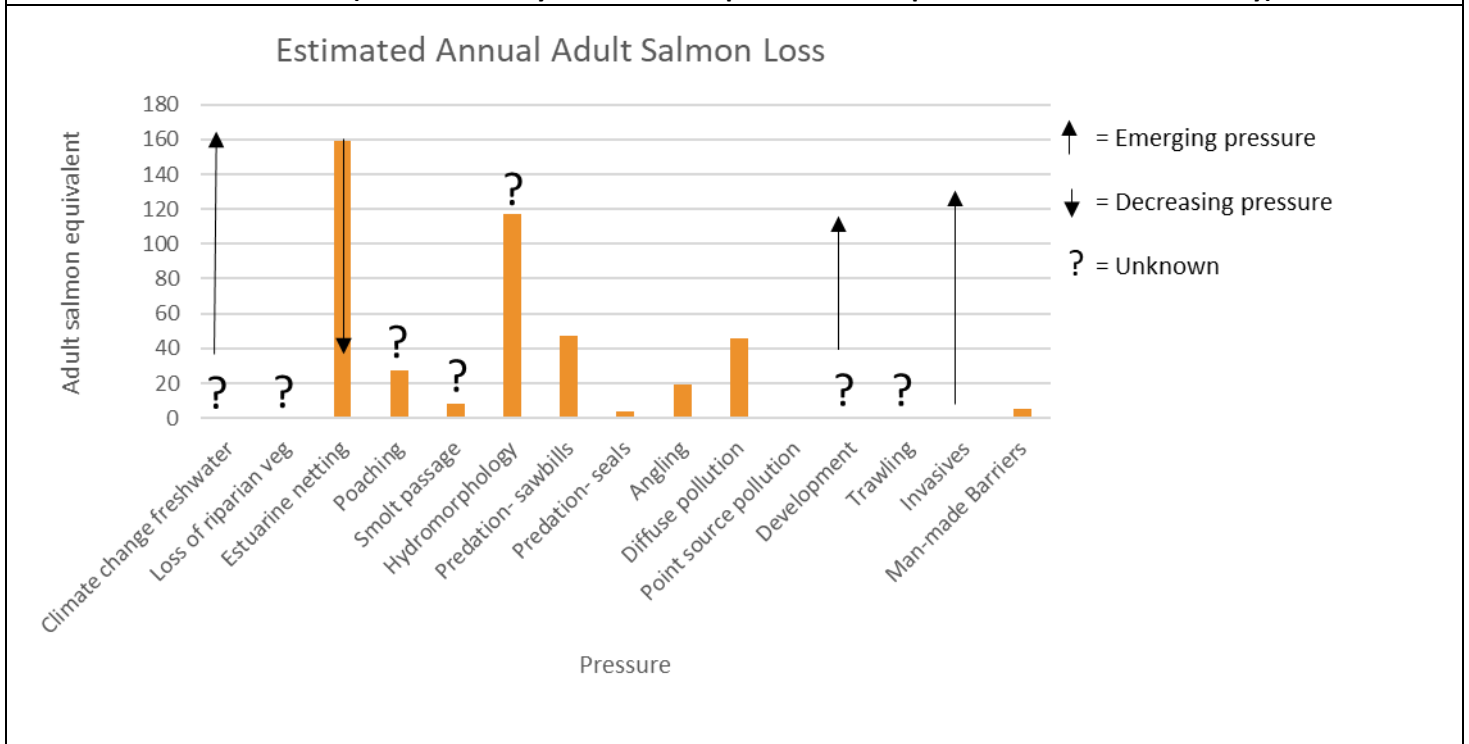
5. THE PRESSURES

There are many pressures facing salmon, sea trout, and the catchment as a whole.

In Spring 2021, BFB participated in identifying and mapping pressures on salmon using evidence where possible. Please refer to the Maps produced [here LINK \(awaiting publication from MS\)](#). Some pressures are emerging (i.e. they are getting bigger with time), some pressures are declining (i.e. getting less with time), some are chronic whereas others are episodic. Individually these pressures may have a relatively small impact but if we tackle each of them we can go some way to helping salmon and sea trout. Climate change and associated declining marine survival is likely to be the biggest pressure on salmon, however the pressures highlighted below are the ones that we CAN influence.

The size of the bars have been worked out using information we have available and are estimates only. As the information we have improves we can refine the size of the pressure bars. Notes on how bar sizes were worked out are given in [Appendix 1](#).

Figure 9: Bar chart showing pressures on salmon and sea trout relative to each other, presented as 'Estimated Annual Adult Salmon Loss' (illustrative only as data incomplete and each pressure assessed differently).

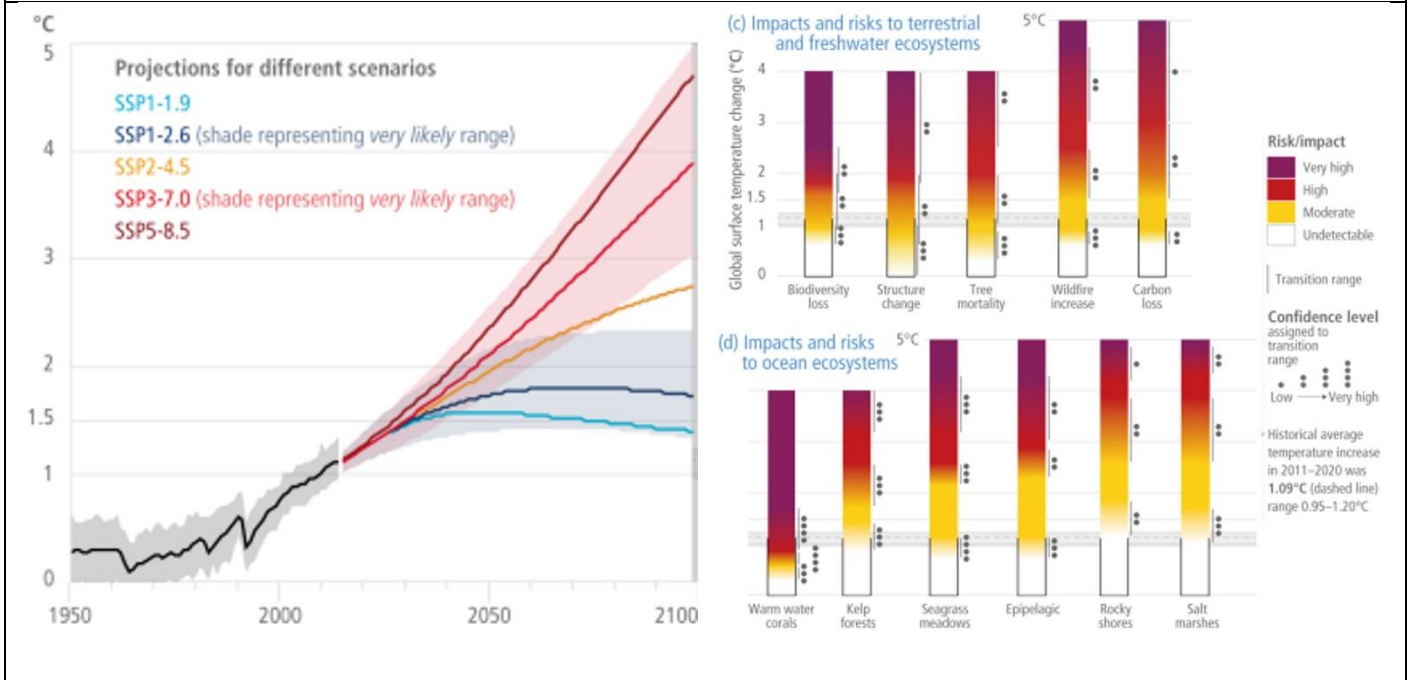


This bar chart can help to show why we want to focus our work in certain areas.

5.1 Climate Change

Climate change is happening and we are seeing the impacts of this around the world. The latest [IPCC report](#) highlights how the environment is changing more quickly than originally predicted as we approach various tipping points. Our behaviour as a species **now** will determine the fate of many others, including that of the Atlantic salmon.

Figure 10: Global surface temperature change. Increase relative to the period 1850-1900. Extract from ‘Summary for Policy makers’ p16. IPCC February 2022.



Climate change is already affecting marine survival of salmon and sea trout through changes in ocean currents (for example warmer water temperature in the North Atlantic is reducing food availability, and fish are having to spend longer at sea before reaching a suitable return size [24]) but changing climate is also affecting the freshwater environment too through increased redd wash-out, increased thermal stress and disease, lower dissolved oxygen levels, water scarcity, and changes to invertebrate lifecycles etc.

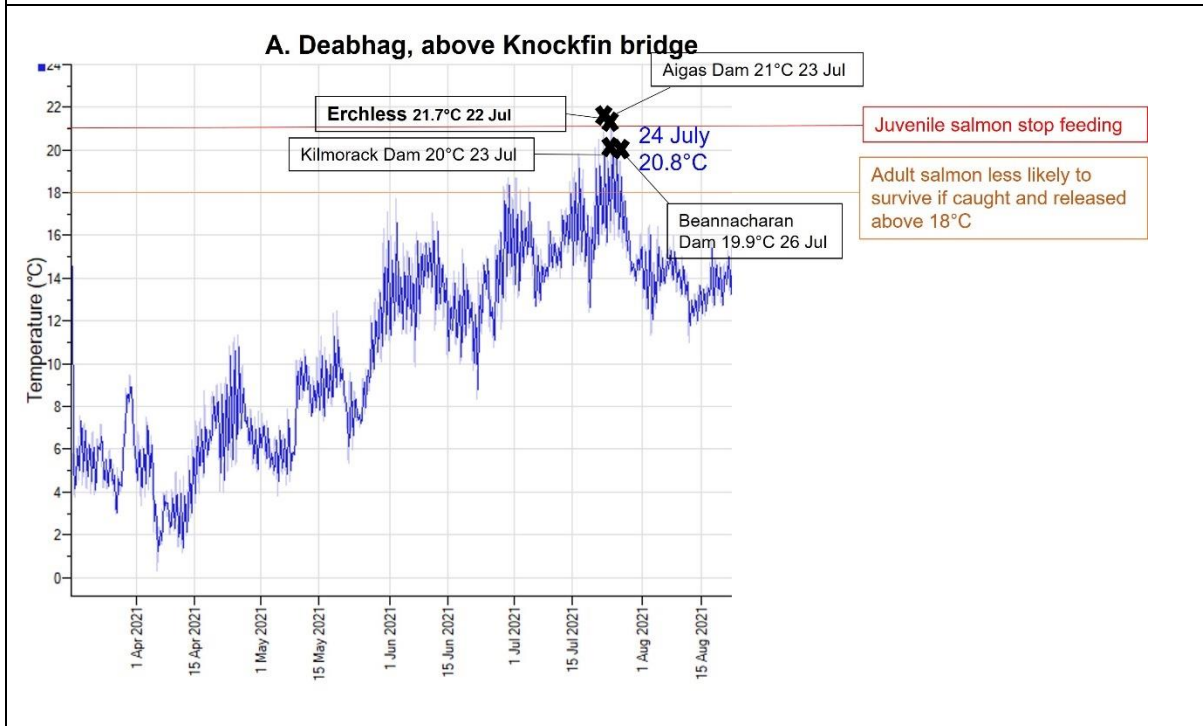
Fish and invertebrates like it cold, however recent years have seen high river temperatures in the catchment and water scarcity across Scotland, see [Figure 11](#).

Historical drainage of moorland has increased the volume and speed of run-off, leading to more erosive spates and loss of peat, soil, and reduced water retention.

The MSS led Scottish River Temperature Monitoring Network (SRTMN) programme of research has allowed a model of river temperatures in Scottish rivers to be developed which identifies where rivers are most sensitive to climatic change and rising temperatures [8].

BFB run two calibrated temperature loggers, one on the U. Midge near the top of the R. Farrar and the other on the A. Deabhag, near the top of the R. Glass. Both are in the accessible reach to salmon and sea trout. Other temperature data is recorded at the dams and at SEPA gauging stations.

Figure 11: Graph showing 2021 highest temperatures in the catchment (at monitoring sites only). Temperatures will have been higher than this further up the catchment in small burns, and are on the increase.



How we aim to tackle the Climate change pressure

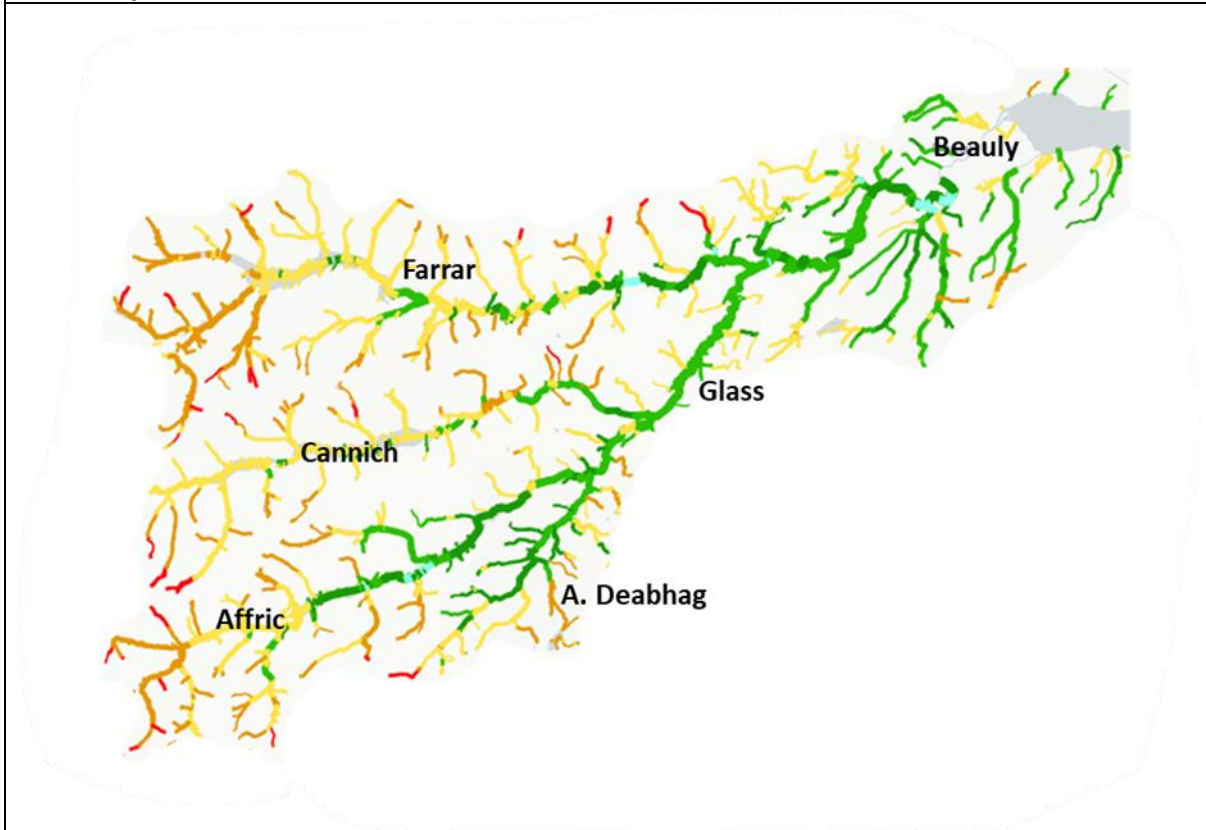
-The 2022 Conservation Policy for anglers now includes a temperature element. Anglers should stop fishing if water temperature reaches or goes above 18°C.

-Riparian Tree Planting. Native, deciduous riparian trees (of local origin) can help to keep rivers cool as well as bringing multiple benefits if planted in the right place:

- 1) Shade helps keep water cool for salmon and sea trout. Marine Scotland have published maps of forecast temperature on the river network which highlights priority areas (especially at the top of the catchment) where we should be encouraging natural regeneration and/ or riparian tree planting.
- 2) Trees can help improve fish productivity in rivers, where salmon numbers have declined.
- 3) Root systems and large woody debris can alter flows and improve habitat for fish.
- 4) Wider biodiversity benefits.

BFB aim to encourage riparian tree planting by engaging with landowners and linking them up with sources of funding and support. BFB hope to continue working with Trees for Life and Riverwoods to help landowners plant trees and will use the SRTMN map to guide prioritisation of this work.

Figure 12: Map showing the Scottish River Temperature Monitoring Network (SRTMN), Management Priority Areas. Red=highest priority (high river temperature with high climate sensitivity).



- Continue temperature monitoring, and gathering data from SEPA and SSE.
- Work with SSE, FMS and SEPA for **better strategic management of the water** resource.
- Encourage landowners to carry out peatland restoration i.e. drain blocking.
- Reduce the Board's carbon footprint.** Leading by example may encourage behaviour change in others. E.g. being conscientious when procuring kit and planning work activities to make trips efficient and worthwhile.

5.2 Loss of Riparian vegetation (Cultural Oligotrophication/ lack of nutrients)

Phosphorous is the limiting nutrient when it comes to freshwater productivity. The balance of this in relation to Nitrogen is important in determining what ecological community exists in the river.

Apart from natural processes, changes to land-use and vegetation since the last ice age (especially at the top of catchments where high deer numbers are prevalent and natural tree regen has been suppressed) is a cause of less nutrients in the freshwater environment [15].

Salmon are key vectors in transferring marine nutrients to the freshwater (and wider) environment when they die after spawning. As adult salmon numbers have declined, it is thought that nutrient levels in the upper catchments of rivers has dropped.

The reduction in nutrients over time has been shown to be the case using diatom cores from lochs e.g. Loch Ness.

Deciduous, riparian trees are ultimately the best way of ensuring fish have enough food to eat, and restoring nutrients to more **natural** levels, however it may be the case that nutrient levels may need further restoration to improve productivity. Work done on the Conon [9] shows that artificial nutrient input can increase growth rates and reduce the time it takes for juvenile salmon to smolt, however there are other consequences associated with this type of work which would need to be considered carefully (e.g. resultant marine survival of smolts).

The 2021 water sampling associated with NEPS were analysed for a wide range of determinants including pH, Nitrate and Phosphate and will make a useful starting point for looking at nutrient levels.

How we aim to tackle the Loss of Riparian Vegetation (lack of nutrients) pressure

-BFB will encourage deciduous, riparian tree planting where possible in the upper catchment. This ties in with existing plans to tackle rising water temperatures in small burns.

-BFB hope to commence invertebrate monitoring (and possibly other monitoring e.g. diatoms or algae) at historic sites to look at nutrient and food availability to fish.

-BFB can look at existing information including the NEPS water sampling results (Nitrate and Phosphate) and see if any sediment core work has been done in the Beaully catchment, as a start to seeing what nutrient levels could be aimed for.

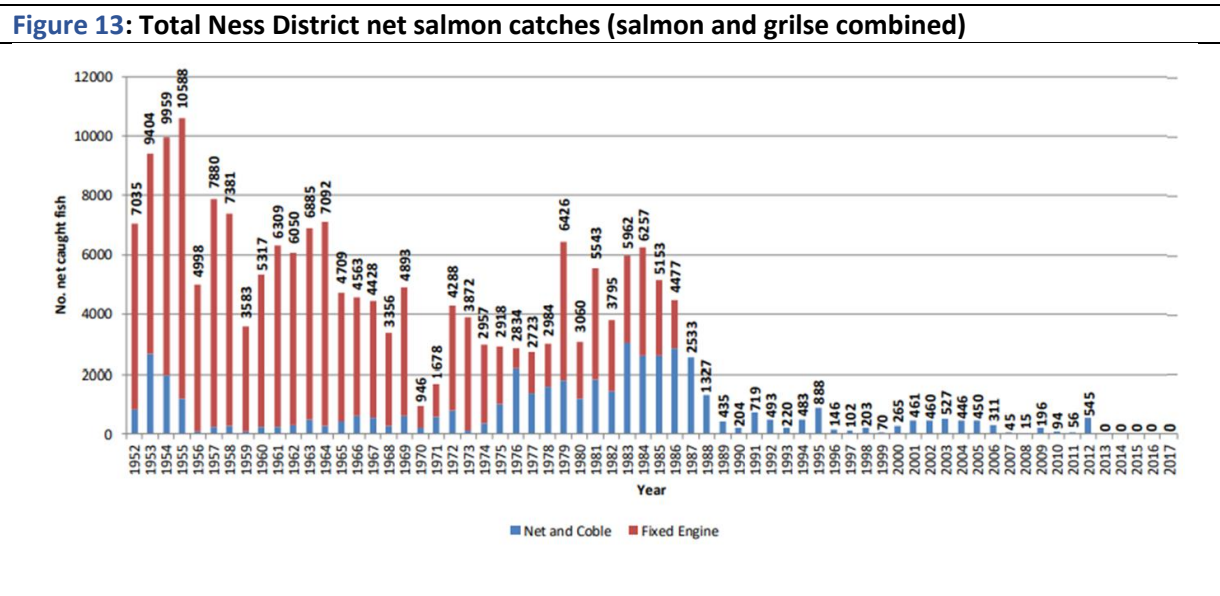


The R. Farrar at Neaty burn confluence, riparian tree cover providing shade and invertebrate prey

5.3 Estuarine netting

Many of the original salmon netting stations in the Beaully district were bought out by the Atlantic Salmon Conservation Trust in the 1980s. These and several others are no longer operational, resulting in a significant reduction in the total numbers of net caught salmon reported. The fixed engine or ‘bag net’ fishery closed in 1986. Those remaining are net and cobble fisheries, which use a ‘sweep net’ paid out from a boat and worked from the shore. The key remaining operational sweep netting stations are located at Rosemarkie, Longman and Alturlie Point and are currently under the jurisdiction of the Ness DSFB.

Conservation agreements (both voluntary and mandatory) have been in place in recent years to stop the taking of salmon. At Rosemarkie, agreements were in place 2007-2011 and 2013-2018. In 2012 when no agreement was in place, 545 fish were captured. Generally the netting stations are not operated as the numbers of salmon have dropped to levels that make it unworthwhile to fish for them using this method. See [Figure 13](#).



Partnership work including the Ness and Beaully Fishery Trust was carried out in 2018-19. Acoustic tagging including tagging fish at Chanonry point (and at the netting stations) with receivers at the mouths of several rivers has shown that fish head to various Moray Firth rivers and suggests the greatest proportion end up in the River Beaully [23].

How we aim to tackle the Estuarine Netting pressure

As the estuarine netting stations have the potential to catch fish from various river stocks (not just the Ness) communications are under way with Marine Scotland, FMS and the Ness Board to see if the jurisdiction of these netting stations can be updated and how conservation agreements to stop the taking of fish (apart from for scientific research purposes) can continue in the future.

5.4 Illegal Exploitation

Illegal Exploitation (the taking of salmon and sea trout without a permit) can have significant consequences for the fishery. Without a full-time bailiff in the past, the Beauly catchment may have been seen as a soft spot for poachers.

In 2021, with funding from SSE and an increased levy to proprietors, BFB employed a Fisheries Officer and Seasonal bailiff who between them patrolled the catchment for 14hrs most days in the season. Their work found evidence of illegal fishing throughout the catchment with a limited use of permits.

Recommendations included to the board

- Improve the permitting systems in place
- Retain a high profile and good relationships with Police Scotland, anglers, ghillies, bailiffs and neighbouring catchments

Lower Beauly: Continue pointing 'accidental' poachers in the direction of the Beauly Angling Association, and youth casting sessions. Improve net mark recording by anglers.

Glass: Jointly agree a bailiffing strategy with the Glass Syndicate. Better signage may be required in the Cannich area.

Farrar: Improvements to permitting where possible

Firth: Work with Marine Scotland Compliance and gather more evidence about illegal RIB and netting activity.

How we aim to tackle Illegal Exploitation pressure

BFB will continue to employ a full-time bailiff to patrol the catchment and work on the recommendations highlighted at the end of each season to improve enforcement effectiveness.



Bailiffing photos taken during the 2021 season

5.5 Smolt passage pressure from hydro dams

Smolts in the Beaully catchment have to negotiate the hydro dams on their way out to sea. At Beannacharan, smolts go down the fish pass, and at Aigas and Kilmorack they go through the Kaplan turbines.

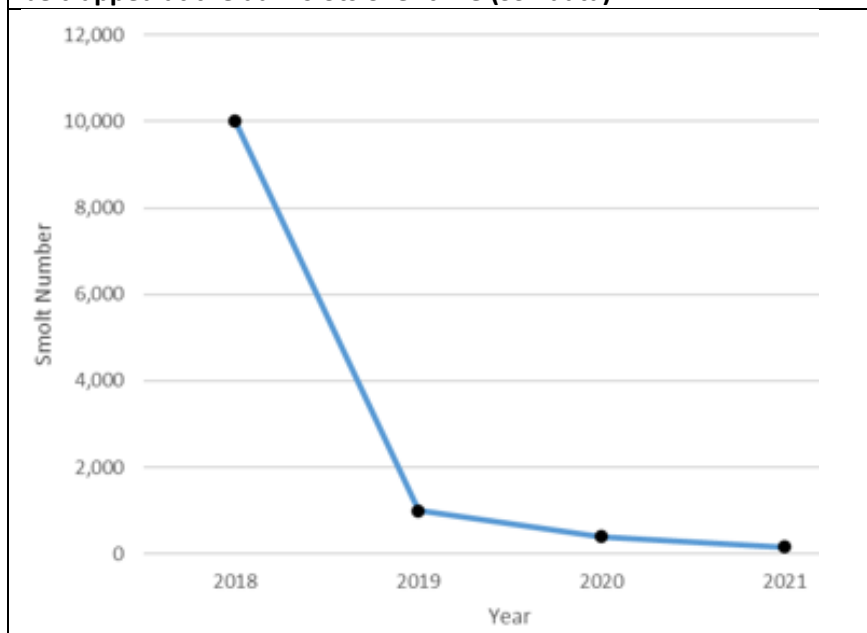
Apart from negotiating the infrastructure itself, the slack water created behind the dams are host to pike and if smolts struggle to find their way out/ downstream then they could be vulnerable to predation and migration delays.

In 2018 it became apparent that there was a problem with smolt migration through the Aigas and Kilmorack turbines in low flows when **>8,000** smolts (approximately 10% of the smolt run) were rescued by SSE and the Ness and Beaully Fishery Trust. In 2019 SSE installed brushes on the entrance to the G1 gate slots at Aigas and Kilmorack ahead of the smolt run to deter smolts from entering. In 2019 **864** smolts were rescued (with a further 100 found during a dive survey). Further brushes were fitted to the G2 turbines at Aigas and Kilmorack in 2020 ahead of the smolt run. In 2020 a total of **310** smolts were observed by SSE as being trapped at the gate slots. Work done by SSE suggests that Kaplan turbines run at higher load improve smolt survival [14].

In 2021 BFB carried out smolt monitoring to pin down the timing of the smolt run in the catchment to enable better flow management by SSE for improved smolt survival. A 4ft rotary screw trap placed at Fasnakyle (the top of the Glass) was monitored and showed the smolt run to have occurred between 15 April-12 May. As a result enhanced flows for smolts were in place between 22 April-1 June, with a peak total of 152 smolts being reported to be seen by SSE at Aigas and Kilmorack on 27 May. This is a 50% improvement compared to the previous year. For more information see [2021 Smolt report](#) [21].

In 2022, sub-sampling was carried out on the Farrar in the form of box trapping to start to look at smolt run timing in this part of the catchment.

Figure 14: Graph showing the total numbers of smolts observed to be trapped at the dam slots over time (SSE data)



How we aim to tackle the pressure on smolt passage from the hydro dams

This pressure appears to be declining at Aigas and Kilmorack dams due to the mitigation put in by SSE and work being done by SSE and BFB. It is currently unknown how Beannacharan dam on the Farrar may impact smolt survival during the smolt run.

-BFB will continue to work with SSE and SEPA to agree an updated smolt protection protocol ahead of each smolt season. In 2021 this included a two-stage regime:

1) April-May: “where reasonably practicable, only the G1 machines shall be run if the load is less than 10MW”.

2) During the smolt run as identified by the board: “where reasonably practicable, if either Culligran or Fasnakyle main machines are generating into the evening then they must maintain generation such that the load at Aigas is not reduced during the hours of darkness”.

- BFB will continue monitoring smolt run timing in the catchment whilst this improves smolt survival.

- BFB aim to carry out an acoustic tagging (or equivalent study) into smolt behaviour in relation to the dams to see if further mitigation is necessary. Precise study remit/ location will vary with available resource.

-BFB will continue to request a national project through FMS and SSE to look at the physiological stress, disorientation, and resultant survival of smolts going through Kaplan turbines.

-BFB will improve the monitoring and reporting of possible smolt mortality in association with the dams.



Photo collage of 2021 smolt monitoring work

5.6 Hydro-morphology pressure (substrate and flows)

Hydro:

It is widely accepted that large hydro dams impede sediment movement and unless managed (with flows), can have detrimental impacts on fish habitat.

Flow regimes originally agreed when the hydro dams went in, in the mid 1950s-60s were set up for angling purposes however as time has gone by the effects of the lack of sediment management in the catchment seems to be becoming apparent. Not least in terms of the lack of spawning habitat present in certain areas below the dams, reflected in juvenile fish numbers. The Rivers Cannich, Affric, Farrar and Lower Beaully require further assessment to see if the over-stability and lack of suitable spawning substrate is natural or not.

Additionally there is now suitable guidance, expertise and case-studies out there to help come up with solutions to rectify the problem (e.g. WFD21d Ecological indicators of the effects of abstraction and flow regulation; and optimisation of flow releases from water storage reservoirs SNIFFER guidance, SEPA sediment management plan guidance).

See [2021 Electro-fishing Report \[20\]](#) for further info on hydro-morphology.

East Deanie burn (Farrar tributary) has historically had low-no fry present, this is thought to be due to a lack of attraction flow at the bottom due to realignment during Beannacharan dam construction/ large silty alluvial fan. There are also a couple of tributaries of the Farrar that are dry and re-watering may be an option if useful fish habitat will be created.

Other human hydro-morphology pressure:

There is also a site at the top of the Farrar that appears to be hydro-morphologically altered although on old maps it appears to have been like it since the early 1900s. Further investigation as to the history of this part of the river (in front of Braulen lodge) is required.

The old Cruives structure appears to hold back valuable spawning substrate. Sediment management here may help improve substrate composition further downstream.

How we aim to tackle the hydro-morphology pressure

-BFB will continue to carry out electro-fishing and make hydro-morphological observations. BFB intend to write a summary report of observations as a starting point for discussions with SSE and SEPA. Following advice, a hydro-morphology survey may be commissioned (scope to be decided with SSE's input) and recommendations followed-up. This may ultimately involve working to get better sediment management planning into the CAR licences, reviewing the flow regimes currently in place, devising restoration project(s) if applicable.

-Concerns have been raised on the Farrar of flows being too low during adult migration and this will be investigated.

-Continue requesting sediment management from SSE at the spout and other intakes on the Farrar.

-Electro-fish E Deanie burn to see if fry distribution has improved. Assess if hydro-morphology is the root cause for lack of/ few fry (past invertebrate sampling showed invertebrates were good).

-Assess if any of the Farrar tributaries would benefit fish significantly from their re-watering and discuss a way forward with SSE.

- Investigate the history of the river in front of Braulen lodge.
- Investigate if sediment management could be worthwhile and implemented at Cruives.



The base of Mullardoch dam with compensation flow, Glen Cannich

5.7 Predation

Predation is a natural part of the ecology of the Moray Firth, however with the decline of salmon stocks, and predation being exacerbated by human impacts (i.e. manmade barriers, climate change, a lack of other prey items) predator management may be justified to Marine Scotland if supported by evidence.

Mammals

Mammals are natural predators of salmon and sea trout and are an important part of the ecosystem.

Seals haul out at the bottom of the R. Beaully however occasionally a specialist seal may come into the river itself and eat salmon up to Kilmorack dam. This is a learned behaviour and any seal management (if it is deemed there is a significant impact to the salmon or sea trout population) should concentrate only on these specialist seals.

Overall, seal numbers counted in the Moray Firth were similar in 2017 compared to 1996 although the proportion of common: grey seals has changed over time [4]. Common seals' main food is sand eels, which have declined in the Moray Firth [18] this is likely due to climate change, where-as grey seals have increased in number and are more generalist feeders.

Dolphins also predate salmon in the Moray Firth, especially at Channonry point where the geographical bottle neck makes salmon easier to catch.

Fish-eating Birds (Goosander, Merganser, Cormorant)

Fish-eating birds such as mergansers, goosanders and cormorants are generalist feeders. They feed on whatever prey is available including on juvenile salmonids. Man-made barriers (including the three hydro dams in the accessible reach) are likely to exacerbate salmon parr and smolt vulnerability to predators. In winter, parr are especially vulnerable as their mobility is mostly determined by temperature.

Historically the populations of sawbill ducks have been monitored annually on the Beaully. Currently monitoring is done 2-3 times a year when a full catchment count of the mainstem is done (down from Plodda at the top of the Abhainn Deabhag, R. Glass, and down from the top of Loch a Mhuillidh on the R. Farrar). Ad-hoc sightings are also recorded by staff on patrol and from ghillies.

Count data is submitted as a licence application to scare and control sawbills especially during the spring when smolts are migrating.

Fish (Pike, Trout)

Little information is available on the impact of large trout and pike on salmon and trout in the catchment, however pike are known to occur in the slack areas behind the dams, in the slow-flowing parts of the Glass, and in lochs. Large trout are known to occur below Kilmorack dam.

How we aim to tackle the predation pressure

Predation management is just one tool in the toolbox alongside all the other measures BFB take to conserve salmon in the river. It is not the standalone answer to save salmon and should always be a last resort as seals (especially) are a natural and loved resident of the Moray Firth.

Seals

-First BFB need to establish whether specialist seals are having a significant impact on Atlantic salmon and sea trout in the R. Beaully or not. BFB will continue recording when seals enter the river and what they're doing. SFCC's seal sighting recording app is used by anglers and ghillies to record seal sightings. Data gathered will help improve BFB's assessment of this pressure and support seal licence applications if made.

-BFB will explore non-lethal seal deterrent methods through engagement with the Moray Firth Predator Management group and FMS (likely through the responsible use of a paintball gun) and ensure that relevant personnel in LBFS are trained.

-Liaise with FMS to review any changes to seal legislation and control.

Birds

-Remain part of the Moray Firth Sawbill Management group. Continue bird count monitoring (winter and spring) to support bird licence application whilst this is an efficient use of time. Utilise any improvements to monitoring through an app developed by SFCC.

-Explore and implement scaring techniques with a range of proprietors.

Fish

-Collect information on pike fisheries (e.g. Loch Beannacharan, Farrar).

5.8 Angling

Angling funds Atlantic salmon and sea trout conservation in the catchment through the levies issued to proprietors. Angling is also important to the local economy. Angling, although an essential part of salmon and sea trout conservation can impact the survival of the fish once released back to the river if not done responsibly.

Angling pressure on fish in the Beaully catchment is thought to be relatively high when compared to other catchments due to the relative location of Kilmorack dam in relation to the catchment's biggest rod fishery (below the dam).

How we aim to tackle angling pressure

BFB produce an updated Conservation Policy at the beginning of each season to encourage best practice in anglers to protect fish (see [website \[1\]](#)).

The policy promotes:

- Catch and release where possible. In 2020 the recorded release rate was 98%. The Conservation Policy aims to protect spring fish and female fish in particular.
- Fish handling in the water only
- The use of barbless hooks and other fish friendly tackle
- The cessation of fishing if water temperatures reach 18°C to protect fish from undue stress (introduced in 2022).
- General best practice
- Work with SSE to ensure fish passage is maintained throughout the migration period, and consider discussing extending the months the fish pass is in operation.



Angler with fresh run salmon (NBFT photo)

5.9 Other pressures

Diffuse pollution

Diffuse pollution refers to low level pollution across a wide area i.e. elevated nutrient levels, silt release etc. Water quality is generally of a high standard in the catchment however there are a few areas where cattle and sheep are eroding the banks of the river and small watercourses. The silt released has the potential to clog and cause compaction of spawning gravels in the long term. When significant, poached banks are in breach of SEPA's General Binding Rules [12].

How we aim to tackle the Diffuse Pollution pressure

BFB aim to work with farmers to encourage fencing off of riverbank in key areas, or alternative stock feeding/ watering regimes. BFB want to encourage participation in Agri-Environment schemes or changes in land-use e.g. R. Glass above Cannich, Kilmorack, Belladrum sub-catchment, Bridgend burn, Tomich burn and Redcastle burn.



Sand deposition on Bridgend burn (historically a sea trout burn)

Point source pollution

Overall water quality is good in the catchment however pollution incidents do occasionally occur due to accidents.

How we aim to tackle the Point Source pressure

BFB have fish monitoring sites up and downstream of key operations in the catchment (e.g. Sewage treatment works) so that the impact of any accidents can be assessed appropriately. BFB hope to add to these. All pollution events involving dead fish are reported to SEPA and investigated.

If significant point source pollution is found then BFB contact the person responsible to make them aware of the potential impact they are having on fish.

Development

Development (e.g. windfarms, hydro-schemes, forestry) in the wrong place or constructed badly can have severe consequences for salmon and sea trout, through the pollution of water courses. The potential impact of **off-shore windfarms** on adult salmon and sea trout migration routes is currently unknown due to a lack of baseline information and the construction of Beatrice windfarm (operational since June 2019) and further planned windfarms ('Moray East' and 'Moray West') on the Smith bank (feeding ground) in the Moray Firth is a concern. Impacts are likely to include changes in currents and tidal flow, changes in benthic sediment composition and loss of nursery habitat (with impact on prey fish- sand eels, sprat, herring), noise and vibration effects, electro-magnetic changes from cabling with potential impact on salmon navigation.

The catchment is host to several commercial **forests**. Bad forestry practice can result in negative impacts on fish through the silting of riverbeds, overshadowing, and acidification.

How we aim to tackle the Development pressure

-BFB will continue to respond to planning applications when consulted and provide advice to developers and consultants to help protect salmon and sea trout.

-Work with FMS to channel funding from off-shore wind-farm development to fund research on the potential impact of off-shore windfarms on salmon and sea trout.

-BFB aim to tackle **Forestry** pressure by inputting into the planning process and stipulating that foresters should adhere to the [UK Forestry Standard \[5\]](#) on water quality and biodiversity. BFB generally have a good relationship with [Forestry Land Scotland](#) and engage with them when it comes to invasives control or requesting access to survey sites.

-Riparian, deciduous, native trees can have positive impacts on fish through shading (to buffer rising river temperatures) and nutrient input so it is important to engage with local Long Term Forest Planning to see if any improvements can be made for the river at the start of the process.

Trawling- OurSeas

Trawling of the Moray Firth damages the seabed and nursery habitats of salmon and sea trout prey. Many coastal fish stocks have collapsed leaving less food for sea trout (and salmon).

How we aim to tackle the Trawling pressure

We are an official supporter of the [#Ourseas](#) initiative who work to get the 3 mile limit re-instated to protect the inshore fisheries across Scotland.

Invasive Non-Native Species (INNS) and Biosecurity

Increased mobilisation of people has led to the increased probability of invasive non-native species (INNS) being accidentally (and intentionally) introduced to the catchment. INNS damage the environment, the economy, health and ways of life.

Although the presence of INNS plants does not appear to have resulted in silting up of spawning areas yet, INNS are an emerging pressure and action to eradicate them now will mean that we do not face an impossible task in the future. The BFB is in a fortunate position where invasives CAN be eradicated before it's too late.

BFB are already dealing with Mink and Invasive plants through the help of the [SISI project](#) however BFB also need to be vigilant about other invasives and fish diseases that are not necessarily visible e.g. *Gyrodactylus salaris*.

Originally from E Russia, and introduced to W Russia, Pink salmon in Norway experienced a sharp increase in numbers and were recorded on the Beaully for the first time in 2021. Although seeming to have a preference for larger river systems, and with no evidence of homing behaviour, they are likely to become more frequent summer visitors to the River Beaully in the future.

How we aim to tackle the INNS and Biosecurity pressure

-BFB works to our [Biosecurity plan \[19\]](#). This includes working with anglers and kayak companies to encourage the proper drying and disinfection of kit if previously used in other catchments.

-All Invasives work is currently funded by the Scottish Invasive Species Initiative which is due to end in October 2022. BFB intend to participate in any future national invasive projects. BFB aim to tackle invasive plants from the top of the catchment to the bottom, and BFB aim to include local volunteers to help carry out this work. i.e. by supporting the Beaully Balsam Bashers. A key part of delivering this work involves having staff and volunteers trained in herbicide application.

-BFB also aims to keep records of all known locations of invasive plants and monitor progress of the work being undertaken (through kayak surveys, drone work and fixed-point photography).

-Work to remove Pink salmon (under licence) if spotted in the Beaully.

- Encourage landowners to control rhododendron adjacent to riverbanks through Forestry Grant Scheme etc. e.g. Erchless and Beaufort.

See [Appendix 2](#) for known Japanese knotweed, Himalayan Balsam and Skunk Cabbage locations.

Barriers

Access to suitable habitat is a key requirement for salmon and sea trout to complete their lifecycle. BFB and SEPA keep a record of known fish barriers in the catchment. The high impact, man-made barriers identified do not seem viable for remediation in a cost: benefit analysis (cost: habitat area opened up). None of the known barriers come close to blocking >1.5km of habitat and so would not qualify for [Water Environment Funding](#).

Temporary debris blockages occur across the catchment and it is important that these are dealt with ahead of spawning time especially in the Belladrum sub-catchment.

The three hydro dams in the catchment are fitted with Borland Lift fish passes. In 2021 the lifts operated 3 times daily (up from the 2 per day prior) but there are occasional breakdowns caused by mechanical faults (e.g. August 2020). SSE are generally quick to respond to any fish passage issues.

The effect of the dams on the migration of other species is unknown, although there have been a few observations in relation to silver eels in the autumn that have evidently gone through the turbines and not survived. The passage of glass eels, elvers and eels is important for the overall function of the freshwater environment. A lack of these native fish may put increased pressure on juvenile salmon from predation etc.

How we aim to tackle the Barriers pressure

- Work with SSE and SEPA to get 3 lifts written into the Kilmorack and Aigas CAR licence (or equivalent). Investigate if longer duration of lifts or night time lifts for sea trout is necessary.
- Carry out debris clearing ahead of spawning time in the catchment tributaries (e.g. Bridgend, Belladrum sub-catchment, Erchless, Eskdale, Home burn) with relevant proprietors (e.g. LBFS ghillies).
- Assess the bridge apron at Bunchrew to see if sea trout passage could be improved using soft engineering/ wooden structures.
- There is a bridge apron (low impact barrier) on the Allt na h-Innse Creagaich (tributary of the Farrar) which could be eased. Despite salmon spotted spawning in past years, 250m could be more easily accessed with simple improvements. Highlighted in the previous FMP.
- Continue identifying and assessing barriers using SNIFFER2 methodology as they are discovered.
- Continue gathering eel data during electro-fishing surveys and observations in the autumn. Analyse fish pass photos. If a problem is suspected then mitigation could be implemented e.g. explore options of improving upstream glass eel/ elver passage through the Borland fish lifts, explore options of improving downstream eel passage above the dams e.g. floating rafts could be installed upstream of dams to then transport the eels downstream but this might not be effective due to adult eel behaviour during migration.

Beavers

Although not strictly a pressure (Atlantic salmon and beavers [*Castor fiber*] co-evolved, with beavers and their predators being a natural part of the ecosystem prior to them being hunted to extinction before the 16th century), our perception of what constitutes a 'healthy' river system is influenced by what we are used to witnessing in current times. Although there are small numbers of beavers living in the catchment already, we are not used to seeing their broad effects on the landscape. Conversely, we are accustomed to the current status and distribution of salmon and sea trout populations. The planned translocation of beavers into the catchment (as a wider governmental tool to reduce the impacts of national biodiversity loss, under the [Beaver Management Strategy](#)) may affect the distribution of salmon and sea trout in the catchment.

The [Glen Affric, River Glass and Beaully Catchment Feasibility study](#) (2022) highlights areas of beaver habitat and suitable gradient for damming in the Beaully catchment.

Based on the available evidence we may experience various conflict in relation to salmon and sea trout, specifically:

- A loss of riparian trees
- A loss of spawning and fry habitat caused by damming and creation of wetland
- Undermining and erosion of riverbanks with possible silting of salmonid spawning substrate
- Possible fish migration issues

Brown trout are likely to benefit from the presence of beavers. An expected increase in abundance of invertebrates due to the creation of wetland may have indirect benefits to salmon but this is yet to be documented in Scotland.

Advice and [mitigation](#) measures are available on a case-by-case basis through NatureScot.

Please see [Briefing note: Beavers, Atlantic salmon and Sea trout](#) for more information.

How we aim to work with Beavers in the catchment

- We aim to work with proprietors to keep burns clear/ remove dams in the lower-middle reaches of burns ahead of the fish migration period in line with NatureScot mitigation guidance.
- We will work with external bodies (e.g. The Beaver Trust, Trees for Life, UHI and Forestry Land Scotland) to better understand the interaction between beavers and fish.
- We will provide comments on consultations/ beaver translocation applications.
- We will engage with national consultations on the Beaver Management Strategy through FMS.

6. BEAULY FISHERY BOARD PRINCIPLES

The BFB have a set of principles to guide their work, they include:

- Putting wild fish first.** Without fish there is no fishing, or funding to carry out our work.
- Aligning with national guidance and best practice.** Working with the system will allow BFB to get more work done whilst getting the best for the Beauly catchment. It also gives BFB an opportunity to influence the national agenda, through FMS. Looking outward (as well as inward) also allows BFB to tap into a wealth of resource that can help inform our work and may lead to more research being done in the Beauly catchment.
- **Long term thinking.** Management decisions BFB make now will affect the future viability of Atlantic salmon and sea trout in the catchment, so we have to be responsible.
- **Putting fish in the wider context** of river ecology and landscape. Fish do not live isolated from their environment, they are inter-connected and affected by the surrounding land-use and in-river processes.
- Working with operators** (and other partners) to get the best for the river and fish. There is much to be gained from good working relationships, especially as we are a small organisation.
- Making evidence-based decisions.**



Previous Chair of the board with SSE staff at Loch Monar 2020

7. PEOPLE: COMMUNITY ENGAGEMENT, PARTICIPATION AND HERITAGE

BFB recognise the large part that local **people** can play in securing the future of the river, fish and fisheries, the necessity to foster future generations' connection with the river, and that the river sits in the wider landscape rich in history and cultural heritage. BFB also benefits the local community as fishing contributes significantly to the local economy and we have an opportunity to help upskill local people (e.g. through traineeships etc).

As a key part of the board's funding is through angling which is in itself in decline, BFB needs to encourage responsible angling in the next generation so we can continue to protect salmon and sea trout in the catchment and foster future stewards of the river.

In 2022 the board hosted a Working with Rivers Trainee and carried out an Oral History Project to tap into the wealth of local knowledge on the river. Recordings are due to be made accessible and archived with Am Baile.

The emerging pressures on the river are often too big for just BFB to deal with alone and volunteers and the local community can help us achieve our objectives whilst everyone benefits from a broad range of positives e.g. sense of community, well being etc.

We aim to continue promoting community engagement, participation and link to the catchment's heritage through:

- Involving volunteers in BFB's work (e.g. smolt trapping, electro-fishing, invasive species control).
- Supporting our Scottish Invasive Species volunteers (including the Beauly Balsam Bashers and Mink volunteers).
- Annual Public Meetings to ensure the public and those working on the river (e.g. ghillies) have the opportunity to engage with the board's work.
- Ensure good communication between board members, proprietors, anglers and the local community. i.e. regular meetings, email updates, webpage and Facebook page updates.
- Work in schools/ with youth development.
- Encourage angling e.g. through NE SANDS steering committee.
- Encourage better connection between locals and the river e.g. there is potential for opening up the river near to the Priory and putting in interpretation and better access.
- Exploring the future of the Ness and Beauly Fishery Trust.



Beauly Balsam Basher volunteers 2021

8. MONITORING METHODS

Monitoring is important so that BFB has evidence on which to base management decisions. Ideally monitoring is linked to an improved management outcome.

Fish Counts continue to be a key source of information regarding the number of adult returners and **BFB will continue to work alongside SSE as they improve the accuracy of their counters.**

Rod catch in combination with angling effort provide data on adult salmon number, size and behaviour. This data is also necessary to set the conservation limit for the river (if fish counts are lacking). **BFB is legally allowed to collect rod catch data.** Scales taken by anglers are also useful to analyse to look at life history and the age of fish compared to their size. In 2021 scales were collected as part of the National Adult Sampling Project and analysed by MSS. **BFB will continue to collect scales from anglers and analyse as time permits.**

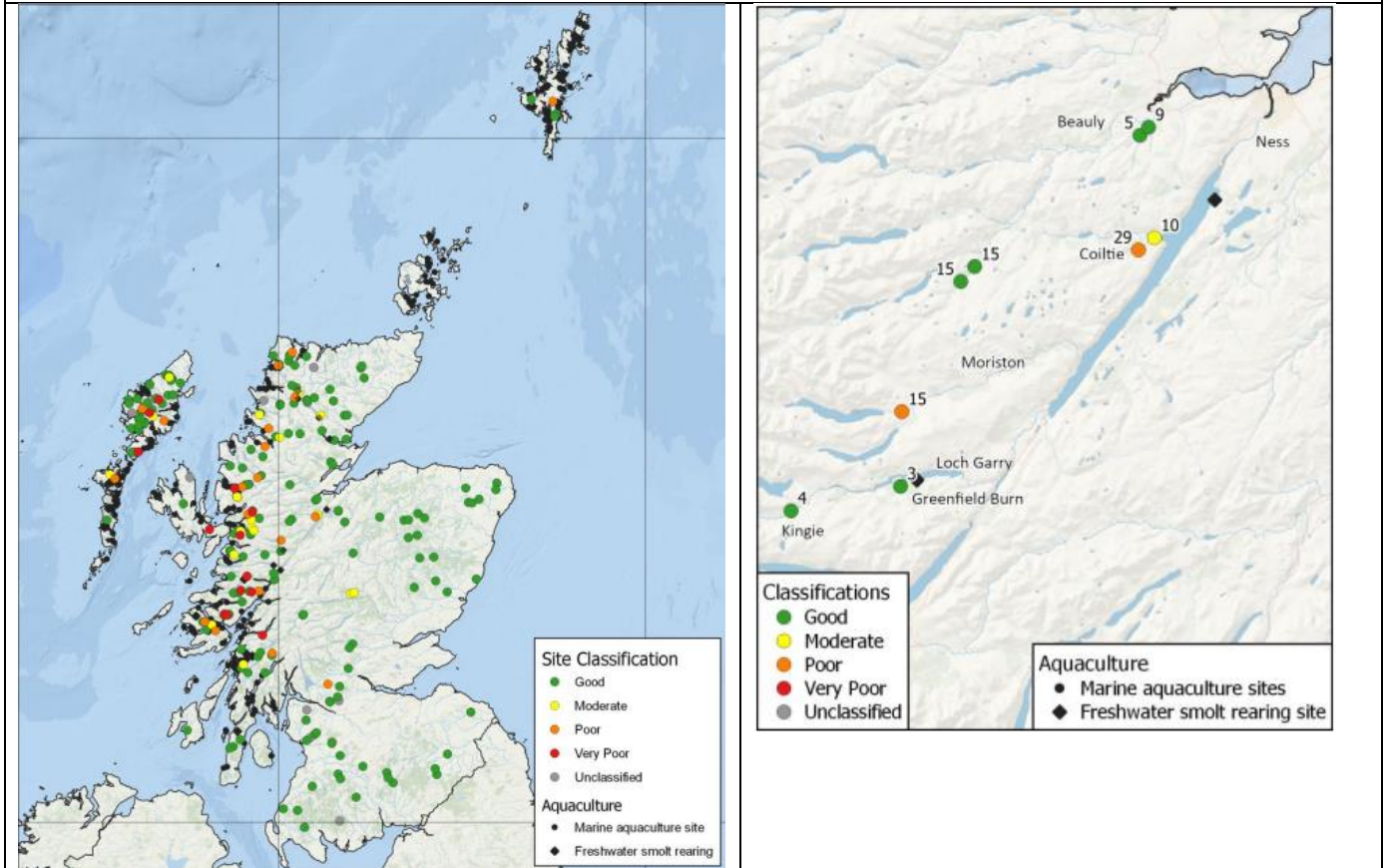
Electro-fishing can show us where spawning is occurring and how parr numbers (related to smolt output) are changing over time. This data is crucial in highlighting potential issues, monitoring any management changes and giving us evidence to base conversations on. **BFB will continue engaging with the National Electro-fishing Programme for Scotland whilst this leaves capacity for other more focused electro-fishing to be carried out.**

Smolt monitoring Whilst this helps improve the management of the river (flows for smolts, improved mitigation at dams) **we shall aim to continue this work to assess smolt run timing** at various locations in the catchment given resource available. BFB aim to do mark-recapture work to see if trap efficiency and smolt output can be calculated in relation to smolt trapping. BFB will review temperature monitoring data to see if this can be used to predict smolt run timing on the Glass and Farrar. BFB will work with LBFS ghillies to improve the reporting and monitoring of possible smolt mortality in relation to the dams.

Increasingly, genetics are proving to be useful as more genetic markers are used to identify various traits of fish e.g. temperature resilience, life history traits. Genetics can reveal areas we need to focus our efforts on e.g. location of MSW or spring fish spawning.

BFB intend to participate in national genetics projects and local ones too (resource dependent) to start building a genetic library of the salmon populations in the catchment for the purposes of potential restoration stocking activities in the future. Already the National Introgression Programme for Scotland (NIPs [6]) sampling (carried out whilst undertaking NEPs work) has shown that the Beaully catchment is less affected by genetic introgression by aquaculture than the west coast (no individual sampled fish were classified as a hybrid). The board with the Lower Beaully Syndicate ghillies participated in the National Adult Sampling Project in 2021 and also a Farrar genetics project has commenced to look at the number of spawners on the Farrar.

Figure 15a: Site classification of the genetic status of sampled wild salmon across Scotland in relation to aquaculture production facilities in the marine and freshwater environments. **Figure 15b:** Genetic status in the Ness and Beauly catchments [6].



Drone work is also planned to be developed, initially through working with board members and volunteers with drones. In 2021 the Fisheries Officer passed the A2CofC pilot exam and survey work will aim to include substrate surveys in relation to hydro dams, redd counts in relation to various flow regimes as well as invasive plant surveys. Ultimately a drone could be used to aid bailiffing (with thermal imaging) and a wide range of other things e.g. illustrating the changes to tree cover in the upper catchment, thermal mapping, smolt migration etc.

Predator monitoring will continue to inform licence applications where this is an efficient use of time. (See 'Predation' Section).

Wider ecology monitoring. Invertebrate monitoring can give BFB an insight into what food is available to fish. This may in future inform any potential nutrient restoration or tree planting work. Algae can be useful indicators of nutrients and other pressures, and identification will be done on an ad-hoc basis.

BFB will generally support external research conducted in the catchment to gain useful insight into the ecology of the river and will aim to maximise the value of any data gathered.

Generally, BFB will aim to participate in national and wider projects where possible.

Beaulieu Catchment Fishery Management Plan
2022-2027

9. WORK PLAN

The following tables show the actions planned to be carried out by BFB over the next 5 or so years by management unit with indicative time frames. Please note that the work programme may change based on work opportunities and developments that may arise so a degree of flexibility is essential.

Table 2A: Catchment-wide Actions										
(Blue= specific time frame/ focus. Light blue= ongoing)										
Pressure	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Climate Change	We can protect adult salmon and sea trout from thermal stress by working with anglers.	-Ensure the Conservation Policy includes temperature, work with ghillies to encourage responsible angling.							Proprietors	
Climate Change	Water temperatures are predicted to increase, especially in small, high altitude burns. We can encourage landowners in the high priority management areas (SRTMN map) to plant riparian trees (native, deciduous, of local origin) or allow natural regeneration.	-Having hosted a landowner engagement evening (Feb 2022) with Russ Jobson (Riverwoods) to highlight funding and support for landowners in the area, build on this through exploring further sources of local funding e.g. Tomich windfarm. Speak to all landowners in the high risk areas and link them up with funding where possible. If invited, attend Deer Management Group meeting.							Local Deer management Groups	
Climate Change		-Engage with Trees for Life (and other partners) to see if there are any partnership opportunities. Work with TFL project Officer to get tree plans put together.							TFL, Riverwoods	
Climate Change		-Continue temperature monitoring								
Climate Change	Being a hydroed catchment we have an opportunity to buffer the effects of rising water temperatures through working with SSE.	-Ensure continued engagement with SSE, FMS and SEPA on how strategic flow management may be used.							SSE, FMS, SEPA	
Climate Change	Healthy peatlands store carbon. Drained and damaged peatland release carbon and cause poor water quality.	-Encourage landowners to carry out peatland restoration.							Landowners	
Climate Change	As climate change is the number one cause of salmon decline, we have a duty to work conscientiously.	-Work to reduce BFB's carbon footprint through responsible procurement, efficient work trips, using the correct vehicle for the job.								

Beaully Catchment Fishery Management Plan
2022-2027

Table 2A continued: Catchment-wide Actions			(Blue= specific time frame/ focus. Light blue= ongoing)							Partners	Approximate cost
Pressure	Description	Action	2022	2023	2024	2025	2026	2027			
Loss of Riparian Vegetation	The decline in adult spawner numbers and land-use practice may have resulted in there being less nutrients compared to natural levels in the freshwater environment, and less productivity than previous.	-Explore how present nutrient levels in the upper catchment compare to historic nutrient levels (pre-industrial). Look at relevant core sample info and NEPS water sampling results (Nitrate and Phosphate).							MS		
Loss of Riparian Vegetation		-Assess the current availability of food to juvenile fish through invertebrate monitoring.									
Loss of Riparian Vegetation		-Encourage riparian deciduous tree planting in the upper-catchment to improve productivity.							Landowners		
Illegal exploitation	Bailiffing conducted in 2021 found evidence of illegal fishing throughout the catchment. At the end of the season a review was conducted, highlighting areas to work on.	-Continue employing at least one bailiff over the season (and a Seasonal bailiff if necessary/ budget allows).									
Illegal exploitation		-Work on implementing the recommendations highlighted at the end of season 2021. These include: -Improving permitting throughout the catchment. -Retain a high profile and good relationships with Police Scotland, anglers, ghillies, bailiffs and neighbouring catchments							Police Scotland, Marine Scotland Compliance		

Beaully Catchment Fishery Management Plan
2022-2027

Table 2A continued: Catchment- wide Actions			(Blue= specific time frame/ focus. Light blue= ongoing)							Partners	Approximate cost
Pressure	Description	Action	2022	2023	2024	2025	2026	2027			
Hydro- dam smolt passage		-Continue to review and improve the smolt flows and rescue protocol with SSE and SEPA on an annual basis or as necessary.							SSE, SEPA		
Hydro-dam-smolt passage	Currently smolt behaviour and survival in relation to all dams in the catchment is unknown.	-Assess smolt behaviour and survival in relation to the dams using acoustic tagging (or equivalent, less invasive techniques). Use findings to push for mitigation measures if necessary (SSE, SEPA).							SSE, SEPA	Cost will depend on remit of study and kit available	
Hydro dam-Smolt passage	Currently the physiological stress/disorientation/ resultant survival of smolts going through turbines is unknown.	-BFB will continue to request a national project to look at the survival of smolts going through Kaplan turbines.							FMS, SSE		
Hydro-morphology impacts from hydro dams	At various locations throughout the catchment downstream of hydro dams there appears to be a lack of suitable spawning substrate and very stable/ compacted conditions. At these locations there are very low juvenile densities. (e.g. R. Affric, R. Cannich, below Kilmorack)	-Continue gathering hydro-morphology observations, old (pre-dam) photos of substrate and Efish data to produce initial summary. Discuss findings with SEPA hydro-morphology team. -If a problem with sediment management is likely discuss options with SSE.							SEPA, SSE		
Hydro-morphology impacts from hydro dams	At various locations throughout the catchment downstream of hydro dams there appears to be a lack of suitable spawning substrate and very stable/ compacted conditions. At these locations there are very low juvenile salmon densities. (e.g. R. Affric, R. Cannich, Farrar, and below Kilmorack)	- If necessary, commission a hydro-morphology survey (scope to be decided based on cost and with liaison with SSE and SEPA) using a third party. - Discuss findings and potential mitigation/ sediment management/ flows/ restoration projects with SSE and SEPA for improved salmonid spawning habitat. -Develop coarse sediment projects with SSE if required.							SSE, SEPA, consultant	Get quotes	

Beaully Catchment Fishery Management Plan
2022-2027

Table 2A continued: Catchment- wide Actions			(Blue= specific time frame/ focus. Light blue= ongoing)						Partners	Approximate cost	
Pressure	Description	Action	2022	2023	2024	2025	2026	2027			
Predation		<ul style="list-style-type: none"> - Remain part of the Moray Firth Sawbill management Group. - Continue sawbill monitoring to support the bird licence application if this is an efficient use of time. -Implement a range of sawbill scaring techniques with proprietors. -Continue to work with SSE on improved mitigation at dams to reduce the impact of man-made barriers on predation of smolts. -Collect information on Pike fisheries and large trout in the catchment. 							MFSMG, SSE		
Angling	Angling supports the conservation of salmon and sea trout but must be responsibly done to avoid unnecessary mortalities.	- Ensure the Conservation Policy is updated each year to encourage responsible angling									
Diffuse Pollution	There are a few areas where eroded banks are releasing silt to burns and the river and diminishing habitat.	- Work with farmers to encourage fencing off or alternative sheep and cattle management in key areas, including participation in Agri-environment schemes e.g. R. Glass above Cannich, Kilmorack, Belladrum sub catchment, Bridgend burn, Tomich burn, Redcastle burn.							Farmers, agri consultant		
Point source Pollution	Overall water quality is good in the catchment however pollution incidents do occasionally occur.	-Improve the range of fish monitoring sites upstream and downstream of key operations in the catchment.									
Point source Pollution		-Continue reporting incidents to SEPA and providing advice to those responsible.							SEPA		

Beauly Catchment Fishery Management Plan
2022-2027

Table 2A continued: Catchment- wide Actions			(Blue= specific time frame/ focus. Light blue= ongoing)							Partners	Approximate cost
Pressure	Description	Action	2022	2023	2024	2025	2026	2027			
New Development	Poor development can pollute watercourses and affect the behaviour of fish. Development in the Beauly catchment may include: Forestry, hydro-schemes, on-shore and offshore wind farms etc	-Respond to new Planning consultations, using best practice guidance, GIS information and local knowledge and data.								Highland Council	
INNS and Biosecurity	We need to be vigilant of invasives and fish diseases we can't see (e.g <i>Gyrodactylus salaris</i>).	-Work to the Biosecurity Plan. - Participate in any future Invasive Species Projects (after SISI). -Treat Japanese knotweed and Skunk cabbage in a top-down direction in the catchment. -Support the Beauly Balsam Bashers -Monitor INNS locations (e.g. kayak survey and fixed point photography).								SISI and future INNS project	
INNS and Biosecurity		-Work to improve reporting and remove Pink salmon (under licence) if spotted in the Beauly.								SFCC, FMS	
INNS and Biosecurity		-Install disinfection kits at the fishing huts. Encourage proper drying and disinfection of kit by anglers, kayakers and businesses.								Ghillies	
INNS and Biosecurity		-Encourage landowners to control rhododendron adjacent to river-banks through Forestry Grant Scheme etc. e.g. Erchless and Beaufort. Carry out control ourselves if necessary.								Landowners	
Barriers	Access to suitable habitat is a key requirement of fish to complete their life-cycle.	- Work with SSE to get 3 lifts per day at Aigas and Kilmorack written into the CAR licences.								SSE, SEPA	
Barriers		- Investigate if longer duration of lifts or night time lifts for sea trout are necessary.									

Beaulieu Catchment Fishery Management Plan
2022-2027

Table 2A continued: Catchment- wide Actions			(Blue= specific time frame/ focus. Light blue= ongoing)							Partners	Approximate cost
Pressure	Description	Action	2022	2023	2024	2025	2026	2027			
Barriers and Beavers		-Highlight and work with proprietors and contractors to deal with debris blockages on tributaries ahead of spawning time, in line with Naturescot and SEPA guidance.							Proprietors, contractor		
Barriers		-Continue identifying and assessing barriers and reporting to SEPA.							SEPA		
Barriers		-Work with SSE to ensure fish passage is maintained throughout the migration period, and consider extending the months fish passes are in operation to allow free passage of early fish. -Continue gathering eel data and observations. Assess if there is a problem and consider potential mitigation measures.							SSE		
Beavers		We will provide comments on consultations/ beaver translocation applications.									
Additional projects if funding/ staffing become available:											

Beauly Catchment Fishery Management Plan
2022-2027

Table 2B: Beauly- specific Actions										
Pressure	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Illegal Exploitation	A review of the 2021 season highlighted several improvements to enforcement could be made.	-Continue pointing 'accidental' poachers in the direction of the Beauly Angling Association, and youth casting sessions. -Improve net mark recording by anglers. -Improve permitting on the Beauly.							Proprietors, BAC	
Hydro-morphology	The old Cruives structure appears to hold back valuable spawning substrate. Sediment management here may help improve substrate composition further downstream.	-Investigate if sediment management could be worthwhile and implemented at Cruives.							LBFS, SEPA	
Predation		-Establish whether specialist seals are having a significant impact on salmon and sea trout through recording of specialist seal ingress and behaviour. -Encourage ghillies and anglers to record sightings using SFCC app. -Explore the use of non-lethal deterrent methods. -Ensure relevant personnel are trained. -Continue to liaise with FMS to review effects of seal legislation and control.							LBFS, SFCC, FMS	
Predation		-Submit seal licence app if a significant problem is detected.							FMS, MS	
Barriers		-Work with Highland Council to ensure rubbish is cleared out of culvert/ under the grate at 'well' on Bridgend burn.								
Additional projects if funding/ staffing become available										

Beaully Catchment Fishery Management Plan
2022-2027

Table 2C: Farrar- specific Actions										
Pressure or Monitoring Tool	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Illegal Exploitation	A review of the 2021 season highlighted permitting could be improved on the Farrar.	-Work with relevant proprietors to improve permitting.							Proprietors	
Hydro-morphology	Concerns have been raised about flows being too low on the Farrar during adult migration.	-A walkover will be conducted to assess fish passage along the mainstem of the Farrar below Beannacharan dam.							Culligran estate, SSE	
Hydro-morphology		-Continued liaison with SSE is required for sediment management at the spout and intakes.							SSE	
Hydro-morphology	East Deanie burn has historically had low-no fry present, this may be due to a lack of attraction flow due to realignment/ large silty alluvial fan.	-Electro-fish this burn to see if fry distribution has improved. Assess if hydro-morphology is the root cause for lack of/ few fry (past invertebrate sampling showed invertebrates were good).								
Hydro-morphology	2021 NEPS surveys suggest the average fry density is less than the Glass. More data is needed to see if the difference is significant. The Farrar downstream of Beannacharan dam appears overly stable, further investigation is necessary.	-Gather more NEPS electrofishing data for the Farrar and Glass to enable a comparison to be made. -Conduct a hydro-morphology walkover/ gather old (pre-dam) photos to assess if there is a problem.								
Hydro-morphology		-Assess if any of the Farrar tributaries would benefit fish significantly from their re-watering and discuss a way forward with SSE.								
Hydro-morphology		-Investigate the history of the river in front of Braulen lodge to see if restoration is necessary/ desirable.							Braulen estate	
Predation		-Collect historic information on the pike netting done in Loch Beannacharan and other fisheries.							Proprietors	
Barriers	Prev. FMP highlighted this potential barrier.	-Assess bridge-apron on Allt na h-Innse Creagaich (Farrar tributary). Monitor u/s of bridge apron. Could be a straightforward fix to improve passage.							SSE	

Beaulieu Catchment Fishery Management Plan
2022-2027

Table 2C continued: Farrar- specific actions										
Pressure or Monitoring Tool	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Monitoring: Genetics		-Continue the Farrar genetics project if resource allows.							Culligran estate, RLI	
Additional projects if funding/ staffing become available										

Table 2D: Glass- specific Actions										
Pressure	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Illegal Exploitation	A review of the 2021 season highlighted improvements to enforcement could be made.	-Jointly agree a bailiffing strategy with the Glass Syndicate. -Explore if better signage is required in the Cannich area.							Glass syndicate	
Additional projects if funding/ staffing become available										

Beauly Catchment Fishery Management Plan
2022-2027

Table 2E: Beauly Firth-specific Actions										
Pressure	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Estuarine netting	Currently estuarine nets in the Inner Moray firth come under the jurisdiction of the Ness board although salmon caught at these fisheries are of multiple stock including Beauly fish.	Liaison with Marine Scotland, the Ness board and BFB should occur to agree a way forward to reflect the mixed stock of the fishery and get improved protection for Salmon and Sea trout.							Ness board, MS	
Illegal Exploitation	Illegal netting activity appears to be occurring on the Firth (net marks on fish, reports of a RIB).	-Work with Marine Scotland Compliance and gather more evidence about illegal RIB and netting activity.							MS Compliance	
Barriers		-Assess the bridge apron at Bunchrew (SNIFFER2) to see if sea trout passage could be improved through soft engineering. Work with landowner and Highland council to ease passage if necessary.							Highland Council, Bunchrew Caravan park	
Additional projects if funding/ staffing become available										

Table 2F: Wider/ National work										
Pressure	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Trawling	Trawling damages the sea bed and key nursery areas of salmon and sea trout prey, e.g. Herring, pollack, sprats etc, also sea trout (especially) may be caught as by-catch. Although trawling does not occur in the Beauly Firth it does occur in the wider Moray Firth (E of Findhorn).	Continue supporting the #OurSeas initiative to bring back the 3 mile offshore trawling ban.							OurSeas	
Additional projects if funding/ staffing become available										

Beauly Catchment Fishery Management Plan
2022-2027

Table 2G: MONITORING										
Monitoring tool	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Electrofishing	Electro-fishing tells us about how fish are using the catchment and highlights problems we can investigate and fix.	<ul style="list-style-type: none"> -Continue participating in the National Electro-fishing Programme for Scotland. Also carry out more focused electro-fishing in the catchment. (e.g investigate hydromorph pressure, E Deanie burn, coastal burns, upstream and downstream of key operations, Allt na h-Innse Creagaich barrier). -If NEPs does not get funded then continue catchment wide monitoring. -Re-visit historic sites as work programme permits. -Work with external bodies to better understand the interaction between beavers and fish. 							MS	
Fish counters	Accurate fish counts provide valuable information about adult return.	-Continue working alongside SSE whilst they improve the accuracy of the fish counters.							SSE	
Rod catch	Provides information on salmon size and behaviour.	<ul style="list-style-type: none"> -Continue collecting rod catch from proprietors (including angling effort) and liaising with MS when setting the Conservation Limit for the river. -Continue scale collection and analysis through the National Adult Sampling Project. -Enable catch returns from each proprietor to be shared between the Clerk and Senior Biologist. 							Proprietors, MS	
Smolts	Smolt monitoring helps us improve smolt survival in the catchment, can highlight the need for improved mitigation and if trap efficiency is assessed may start to give us smolt output data.	<ul style="list-style-type: none"> -Continue monitoring water temperature and smolt run timing to inform improving flow management and smolt survival in the catchment. -Mark-recapture work to be done where possible to assess trap efficiency. Adapt smolt monitoring as knowledge improves. -Work with LBFS ghillies and anglers to improve reporting of possible smolt mortality in association with the dams. 							SSE	

Beauly Catchment Fishery Management Plan
2022-2027

Table 2G continued: MONITORING										
Monitoring Tool	Description	Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Smolts		-Review whether temperature monitoring data gathered from the U. Misge (top of R. Farrar) and top of Glass is effective at predicting smolt run timing.								
Genetics	Genetics are useful for highlighting vulnerable populations of salmon but also in building up a library of the salmon we have. This may come in useful for any future restoration stocking work.	-Continue with the National Adult Sampling Programme and National Introgression Programme. -Continue the Farrar genetics project if resource allows. - Explore if other proprietors are interested in funding fry genetics analysis.							MS, Culligran estate, proprietors	
Drone	We aim to develop this over the next 5 years.	Explore the use of drone survey work and mapping in the catchment, including: -substrate distribution in relation to hydro-dams -smolt migration -redds in relation to flow regimes - Bailiffing/ thermal imaging of the Firth. -Temperature mapping -INNS (inc Pink salmon, plants)							FMS drone group	
Invertebrates	Can be useful to look at the productivity of local sites and food availability to juvenile salmon.	-Assess the current availability of food to juvenile fish through invertebrate monitoring, initially at historic monitoring sites. Consider other nutrient monitoring (e.g. diatoms or loch sediment cores) if funding available.							Landowners	
External research		-Generally support external research and national projects if in the interest of the river.								
Additional projects if funding/ staffing become available										
Fresh Water Pearl Mussels	Currently the location or status of this key species is not well understood, although their lifecycle depends on juvenile salmonids	-Get access to existing survey data and if necessary/ time allows, assess historic EFish sites for presence of Mussels/ wider locations on the Beauly etc.								

Beauly Catchment Fishery Management Plan
2022-2027

Table 2H: People: Community Engagement, Participation and Heritage										
Description		Action	2022	2023	2024	2025	2026	2027	Partners	Approximate cost
Local people are important in securing the future of the river, and BFB are well placed to encourage engagement and to foster future stewards. We can learn from others.		-Provide opportunities for volunteering (smolt trapping, electro-fishing, invasive species control). -Supporting our SISI volunteers (i.e. Beauly Balsam Bashers and Mink vols). -Annual Public meetings to ensure the public have an opportunity to engage with the board's work. -Ensure good communication between the board, proprietors, anglers and local community. - Encourage angling e.g. through NE SANDS steering committee.							Local community	
		-Oral history project recordings to be archived and made accessible.							Local community	
		-Work in schools/ youth development (with relevant safeguards in place).							Schools	
		-Liaise with Ness board about the future of the Ness and Beauly Fishery Trust.								
Additional projects if funding/ staffing/ opportunity becomes available										
Placemaking project	Placemaking aims to connect the local community with the place they live through cultural and natural heritage.	-Seek funding and work with a local delivery partner to consult with residents as to whether they would support the opening up of the river in Beauly adjacent to the Priory and Orchard Park. Works could include an interpretation board (covering salmon lifecycle, willow carr habitat, beavers, a bit about BFB), a path and a couple of benches. This would encourage improved engagement with the river but would need ongoing maintenance to be done by a community group.							Local community	

10. PARTNER ORGANISATIONS AND GROUPS

Thanks to the following organisations and groups for their ongoing support. They have been consulted in the formation of this management Plan and their comments either incorporated or included in [APPENDIX 3](#).

10.1 [Fisheries Management Scotland](#) and Scottish Fisheries Co-ordination Centre

Fisheries Management Scotland (FMS) represents the interests of Fishery Boards and Trusts across Scotland. Both organisations encourage close collaboration, knowledge sharing, and development of their membership. They co-ordinate national projects on behalf of external bodies (e.g. Marine Scotland) and generally provide support across a wide range of topics relevant to Atlantic salmon and other fish species.

Scottish Fisheries Co-ordination Centre (SFCC) hosts the electro-fishing database, runs training courses, and develops useful tools for members etc.

FMS is the go-to organization for high level discussions about policy with Scottish Government, SEPA etc.

10.2 [SSE](#)

Scottish and Southern Energy (SSE) operate the hydro assets in the catchment. They fund a significant proportion of the board's full-time staff (Senior biologist and Fisheries Officer) which allows the board to carry out its duties in improving the river and protecting the fishery. SSE are also helping with smolt monitoring. The dams will be part of the landscape for years to come so we need to work with SSE to improve operations for the benefit of fish.

Apart from abiding by its duties under the CAR licences set by SEPA, SSE is in a unique position to manage the water resource strategically for fish and for the health of rivers, this is more the case than ever with the backdrop of climate change.

We need to work with SSE through FMS to push for better resource management across Scotland to maximise fish passage for all species (upstream and downstream) and buffer the effects of climate change. We also need to gather information as basis for discussions with SSE and SEPA to continue improving the conditions of the CAR licences.

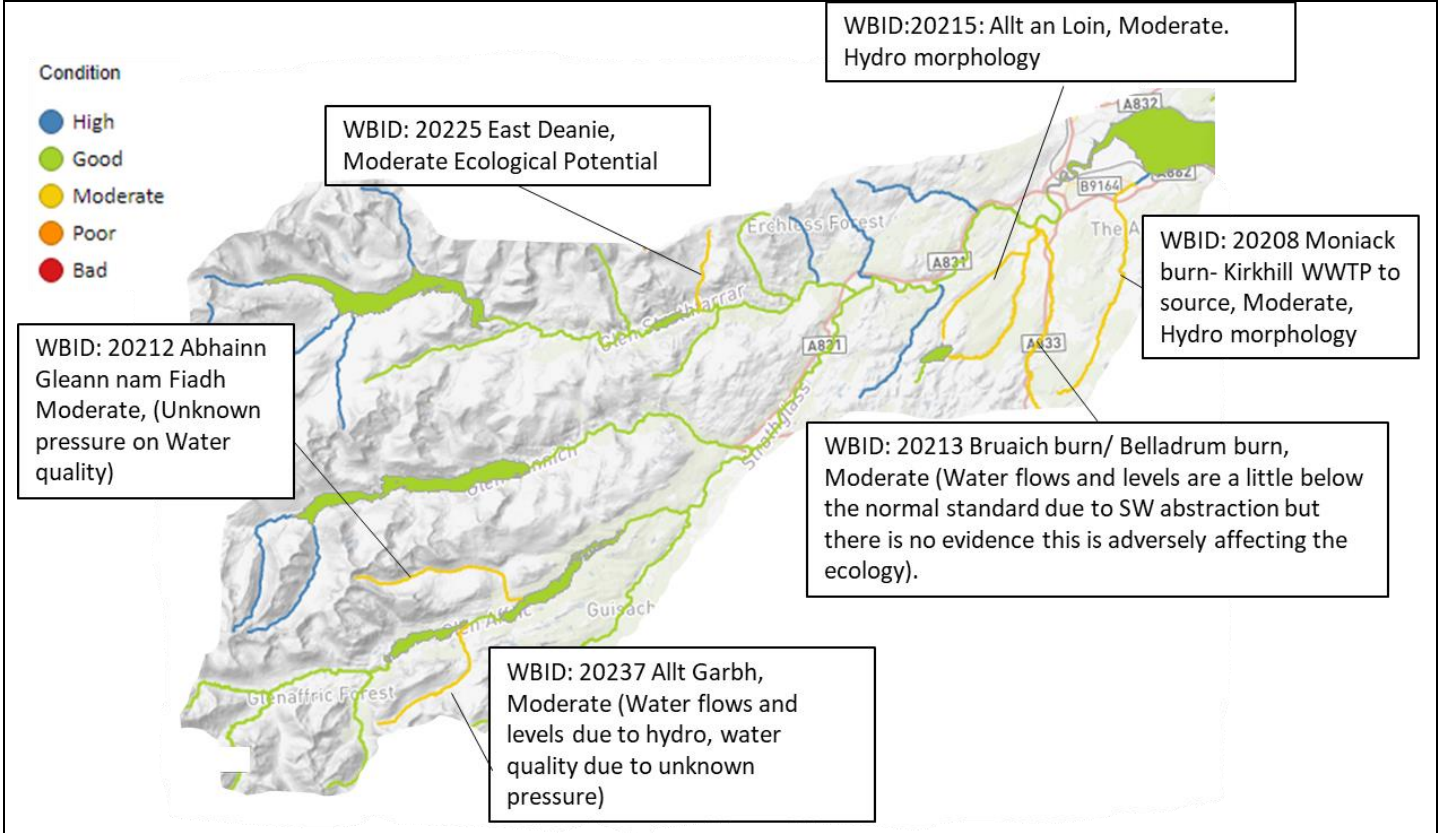
“SSE's hydro-electric assets in the Scottish Highlands means that it has a duty of care to ensure that any negative environmental impacts from its hydro stations are minimised. This duty of care dates back to an Act of Parliament in 1943 which stated: ‘the Board should have regard to avoiding as far as possible, injury to fisheries and to the stock of fish in any waters’. 75 years on, this remains SSE's ethos... SSE recognises that to manage the environmental issues on each river effectively, it needs to operate in a collaborative way with the other interested parties on each river. SSE has set up partnerships with the District Salmon Fisheries Boards and Trusts... The Atlantic Salmon is an iconic species and attracts many visitors to Scotland. It justifies its protected species status and the efforts to do all we can to allow safe passage to and from their spawning grounds” ([SSE's 2018 Biodiversity report \[13\]](#)).



10.3 Scottish Environment Protection Agency

The Scottish Environment Protection Agency (SEPA) work to improve the water environment through the Controlled Activities Regulations and the Water Framework Directive. With the 2027 Water Framework Directive deadline looming, there is no better time to work with SEPA and wider stakeholders to push for improvements to the water environment and get improvements to CAR licences (e.g. fish passage at hydro dams, sediment management etc).

Figure 16: SEPA 2020 classification of water bodies [Water Classification Hub \(sepa.org.uk\)](http://sepa.org.uk)



Most of the high impact man-made barriers in the catchment are just below where burn gradients become steep so in a cost-benefit analysis it would not be worth easing barriers at Teawig (culvert), Black burn (tall weir), or Glass burn (bridge apron). The bridge apron over Bunchrew burn is worth further investigation as this burn could be important for sea trout. The bridge apron at Allt na h-Innse Creagaich (thought to be low impact) may also be eased. Although funding may not be available through the Water Environment Fund there may be other mechanisms to ease these barriers.

10.4 [NatureScot](#)  **NatureScot** Scotland's Nature Agency
Buidheann Nàdair na h-Alba

NatureScot is a public body who aims to protect and promote Scotland's natural heritage, whilst also encouraging related socio-economic benefits. The Beauly catchment does not contain any Special Areas of Conservation (SAC) for Salmon. NatureScot are the licensing authority for any mitigation in relation to beavers and administer various funds including the Scottish Invasive Species Initiative and Traineeships. NatureScot also fund the Scottish Invasive Species Initiative (SISI project) which BFB (through NBFT) are part of.

10.5 Marine Scotland and [Marine Scotland Science](#)  Scottish Government
Riaghaltas na h-Alba
gov.scot

Marine Scotland are the statutory body responsible for consenting fishery management work in the catchment on behalf of Scottish government. They are also responsible for setting the Conservation Limits/ river gradings.

Marine Scotland Science (MSS) co-ordinate national fish monitoring projects. E.g. The National Electro-fishing Programme for Scotland, The National Adult Sampling Project, The National Introgression Programme etc. Information and other outputs from these projects (e.g. data analysis tools and reports) are useful in putting the Beauly into context with other rivers and the funding provided to carry out these projects enables BFB to carry out a higher standard and quantity of work, enabling us to learn more about what's going on in the catchment.

10.6 Neighbouring Fishery Boards and Trusts

Generally BFB have good working relationships with other Fishery boards and trusts through our engagement with the SFCC and FMS.

[Cromarty Fishery Board](#)  Cromarty Firth
Fishery Board

The Cromarty Fishery Board on the Conon catchment have a similar remit to us but on the Conon. We work together for effective bailiffing (joint patrols, intelligence), kit sharing, delivering the Scottish Invasive Species Initiative and SANDS angling development.

[Ness fishery Board](#)  **NESS**
District Salmon Fishery Board

The Ness board have a similar remit to us but on the Ness catchment. We work closely with them on issues of bailiffing, netting on the firth, matters concerning the Ness and Beauly Fishery Trust, and SANDS angling development.

[Ness and Beauly Fishery Trust](#)  **nm**
Ness & Beauly Fisheries Trust

The Ness and Beauly Fishery Trust (NBFT) employed staff until 2019, and were the main conduit for work on the Beauly up until that point. The future of the Ness and Beauly Fishery Trust will depend on liaison between the two boards (Ness and Beauly) in 2022.

10.7 [Highland Environment Forum](#)



BFB are a partner of the Highland Environment Forum (HEF). HEF is made up of local interest groups who want to improve the environment and biodiversity across Highland in line with the local [Biodiversity Action Plan](#). The group exists to encourage better co-ordination and knowledge sharing between partners as many of us have similar objectives and can achieve more by working together.

10.8 [Our Seas](#)



BFB are a supporter of the Our Seas campaign. OurSeas is made up of a broad range of interest groups who are concerned about the collapse of fish stocks, and the result on coastal communities and businesses in Scotland. The main aim of the group is to improve fisheries across Scotland through the re-instatement of the 3 mile limit (ban trawling within 3 miles of the shore). Although the Inner Moray Firth is not trawled, parts of the Outer Moray Firth are (e.g. prawn trawlers operate past Findhorn and squid trawlers operate out of Fraserburgh). Trawling damages habitat for juvenile marine fish which are the food of sea trout and salmon. It is also possible that sea trout may end up as by catch ([Moray Firth Sea Trout Project Final report](#)).

10.9 [Highland council](#)



BFB's main involvement with Highland Council is through Planning. There is opportunity to engage with the council on a wider variety of issues (e.g. funding for placemaking projects, local policy and local Development Planning).

10.10 [Trees for Life](#)



and [Riverwoods initiative](#)



RIVERWOODS

Trees for Life (TFL) has a vision “of a revitalised wild forest in the Highlands of Scotland, providing space for wildlife to flourish and communities to thrive”. We aim to work in partnership with TFL in delivering some of our riparian tree work in priority areas.

Riverwoods aims to create “a network of thriving riverbank woodlands and healthy river systems across Scotland”. We have already worked with Riverwoods and benefitted from their advice and support when working with landowners.

10.11 Proprietors

There are 14 fishery owners in the catchment, each with their individual interests but connected through fish and the river. The Board is made up of representatives of these proprietors and works with them to protect the fisheries.

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APPENDIX

APPENDIX 1- Data to illustrate relative pressures graph

Pressure	Annual egg loss	Overall Comment	Adults in total	Comments
Climate change freshwater	??	Emerging	??	Serious impact forecast (SRTMN map).
Loss of riparian veg	??	Chronic, unknown	??	
Netting	232,140	Overestimate	159	545 fish last taken from netting stations in Beauly firth in 2012. NBFT found of 55 fish recorded, 16 (29%) ended up being in R. Beauly (Moray Firth Adult Tracking Project 2019). 29% of 545= 159 fish. 580,350 eggs x 0.4=232,140 eggs. Does not account for decline since then.
Poaching	39,420	Minimum estimate	27	Investigation and Bailiff info. In 2021: 3 turned up dead with net marks, 11 warning letters issued, plus other observations= total of 27 fish, 98,550 eggs x 0.4=39,420 eggs.
Smolt passage	11,680	Minimum estimate	8	Minimum estimate as excludes Beannacharan, and only a very approximate minimum estimate from operator. Also does not include possible direct smolt mortality of going through the turbines (no observations or records for recent years). 150 smolts, 5% sea survival= 8 fish=29,200 eggs x 0.4=11,680 eggs
Hydromorphology	429,679	Area based estimate	117	0.050127km ² area possibly affected by lack of sediment management, absence of fry (Affric and Cannich). = 50127m ² . 2021 average parr density on mainstem Glass 24/100m² . Area thought to be affected could produce equivalent of 12,031 parr, assume egg to parr survival is 2.8%. 12,031 / .028= 429,679 eggs. Adult calc: 12,031 parr x .26 parr to smolt survival = 3128smolt = x0.05 marine survival= 156 adults OR 50127m ² x 3.1/m ² egg requirement= 155,394 eggs, 1% to smolt=1,554 smolts x 5% sea survival= 78 adults. Average of these 2 methods (78+156/2)= 117 adults . Does not take into account other potential hydro-morph issues on the Farrar or below Kilmorack.
Predation- sawbills	69,350	Human pressure only	47	Unnatural pressure caused by human barriers. A total of 7 birds seen above the dams in 2021. Goosander and Mergansers can eat 19 smolts per day. Assume peak smolt run lasts 1 week. 133 smolts per day x 7 days=931 smolts. Assume 5% return rate =47 adults= 19 hens= 69,350 eggs. Does not take into account natural predation.
Predation- seals	5,840	Reporting improving	4	Ad-hoc sightings suggest 2 specialist seals per year come into the river, 4 fish x 3650= 14,600 eggs x 0.4= 5,840 eggs
Angling	27,740		19	3% of fish reported to have been kept in 2021 out of 629= 19 fish= 69,350 eggs x 0.4= 27,740 eggs
Diffuse pollution	92,169	Area-based, Approximate	46	Total area affected: 29,732m ² (Tomich burn: 11,253m ² , Bridgend: 5711m ² , Redcastle: 5000m ² , Glass: 6768m ² , Belladrum: 1,000m ²). 29,732m ² x 3.1 MS eggs required per m ² = 92,169 eggs. 1% = 921 smolt (salmon pop modeller), 5% marine survival= 46 adults
Point source pollution		Episodic		V occasional
Development	??	Unknown	??	Impact of off-shore windfarms etc unknown
Trawling	??	Unknown	??	Impact of trawling in outer Moray Firth on adult salmon food fishes or on sea trout directly unknown
Invasives		Emerging		Present in catchment but not seemingly affecting fish populations yet, whilst kept under control.
Man-made Barriers	9,626	Area-based, Minimum estimate	5	Approx area affected: 3,105m ² (Allt na h-Innse Creagach: 750m ² , Black burn:1200m ² , Teawig: 975m ² , Glassburn: 180m ² , excluding Redcastle, excludes debris blockages and possible wider hydro dam passability). 3,105m ² X 3.1 MS egg requirement = 9,626 eggs, 1% to smolt= 96 smolts, x 5% sea survival= 4.8 (5 adults).

Assumptions made: Beauly system is similar to Conon system in terms of eggs per hen and sex ratio. 2021 average eggs per hen on the Conon (including for both grilse and MSW) was 3650 eggs. 10 year average sex ratio 40% hen, 60% cock with large annual variation. 5% sea survival assumed. Salmon Population Modeller used for between life-stage survival figures (<https://www.onlineintegrity.net/salmon-modeller/>). Dam counts suggest a total of 4465 equivalent returning fish at Kilmorack (accounts for counter undercount of 25%).

Map 3: Known locations of Skunk Cabbage in the catchment

