

# Scottish Wild Salmon Strategy

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# Scottish Wild Salmon Strategy

## Ministerial Foreword



As Cabinet Secretary for Rural Affairs and Islands I am proud to present this Wild Salmon Strategy.

The Atlantic salmon is one of the most magnificent animals in the rich and vibrant tapestry of nature in Scotland. Its special status as *King of Fish* is evident in so many aspects of our culture throughout history and in present day Scotland.

However, there is sadly now unequivocal evidence that populations of Atlantic salmon are at crisis point. Although the pattern of decline is repeated across the salmon's North Atlantic range, likely caused, at least in part, by the effect of climate change on survival during its marine phase, there remains much that we can do in our rivers and coastal waters to build resilience and transform the fortunes of this iconic fish for the better.

The turnaround of the River Clyde where salmon were once extinct serves as an example that transformational changes are possible. Hard work and investment by multiple partners to improve water quality and restore connectivity in this heavily industrialised river means that salmon have now made a welcome return to the Clyde and its tributaries.

This and many other hugely valuable initiatives already underway across Scotland will take us closer to achieving the vision set out in this Strategy. Nevertheless, it is apparent that while, for example, difficult steps have been taken in recent years to limit the killing of salmon by anglers and coastal netting operations, the pace and scale of action across the many other pressures affecting salmon must be stepped up.

We must now reinvigorate our collective efforts to ensure a positive future for wild salmon. This will require the Scottish Government, Agencies, the charity and private sectors to work together and coordinate action to prioritise the protection and recovery of Scotland's wild Atlantic salmon populations.

While there are legal requirements that drive our commitment to the protection of wild salmon, we are also clear that the revival of salmon populations and the habitats they depend on will provide multiple benefits to society and will play a significant role in our ambitions for the rural economy.

In parallel with the actions we take here in Scotland, we are committed to support and push forward collective action in the international arena, so that many of the young salmon that depart our rivers survive the challenges they face on the high seas to return to their home river to spawn the next generation.

Importantly, this strategy does not exist in isolation but forms part of the Scottish Government's ongoing commitment – as expressed in Scotland's Environment Strategy - to lead by example and play our full part in tackling the twin crises of climate change and biodiversity loss, during what the UN has declared the Decade on Ecosystem Restoration 2021-30.

I wish to thank the Advisory Group that has shaped the strategy and look forward to engaging stakeholders in the development of an Implementation Plan to drive collective action across government, business, and civil society. I do not underestimate the task ahead but through the strength of our partnerships and shared efforts I am confident that we can succeed in achieving our vision for Scotland's wild Atlantic salmon.

**Mairi Gougeon MSP**

**Cabinet Secretary for Rural Affairs and Islands**

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## 1. Introduction

Atlantic salmon<sup>1</sup> are iconic migratory fish that start their lives in streams and rivers, migrate to the high seas to grow and return home to spawn, connecting vast ranges of diverse habitats. The species has been in serious decline in recent decades across its North Atlantic range.

As Scotland is a stronghold for salmon we have an international responsibility to play our full part in a collective response. Salmon populations are affected by a wide range of pressures, some at sea and many others acting within the Scottish freshwater and coastal environments. This strategy sets out the breadth of pressures and management responses in one place for the first time to establish a new path of restoration and recovery for salmon in Scotland.

This strategy is framed around a high-level vision and objectives that will guide collective action. The nature of salmon and the range of pressures they face throughout their remarkable life cycle requires that the action we take must be extensive and delivered at pace. Salmon have been the subject of a long history of legislation and governance, but we must now ensure that the framework for collective action is fit for the challenges we face now and in future, not least in the context of a changing climate.

## 2. A vision for Scotland's wild Atlantic salmon

### Vision

Scotland's wild Atlantic salmon populations are flourishing and an example of nature's recovery. We will achieve this through the application of best-practice science and management.

### Objectives

- Scotland's rivers have healthy, self-sustaining populations of wild Atlantic salmon that achieve good conservation status.
- Wild salmon management is evidence-based and underpinned by integrated data gathering, research and dissemination.
- The environmental and socio-economic benefits arising from healthy wild Atlantic salmon populations are identified and maximised through partnerships between the public, private and charitable sectors.

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<sup>1</sup> Hereinafter salmon refers to wild Atlantic salmon (*Salmo salar*) unless otherwise stated.

### 3. Scotland's Atlantic salmon

Salmon features highly among the wildlife species readily associated with Scotland by the public. They live in fresh water for 1-4 years before undertaking a long migration north to their oceanic feeding grounds in the North Atlantic. After 1-3 years at sea, adults often return to the river in which they were hatched to spawn and begin the next generation.

This life cycle means they are exposed to a range of threats and pressures in streams, rivers, sea lochs, estuaries, coastal waters and the open ocean. Consequently, conservation of the species requires consideration of how we use the land, how we use water in our rivers and lochs, and how we use our seas, as these habitats can all have an influence on the health of Scotland's wild salmon populations.

The numbers of salmon returning to Scotland's coast have declined since the early 1970s (Fig. 1). The estimated numbers of spawning salmon remained steady over this period, before declining from 2010 onwards.

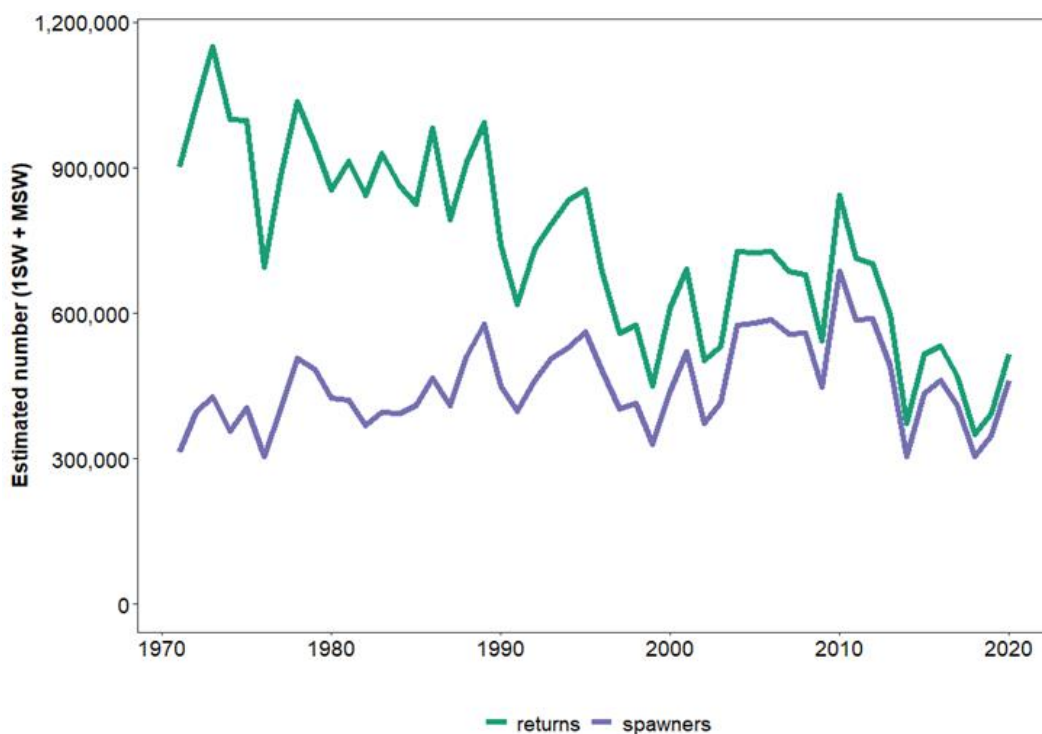


Figure 1: Trends in the estimated numbers of salmon returning to Scottish coastal waters (returns: green line) and the numbers spawning in Scotland's rivers (spawners: purple line) 1971 – 2020. Estimated numbers include both fish that spent one (1SW) and >1 (MSW) years at sea.

The difference in trends between the two measures is a result of the decline in the removal of salmon by fisheries. The decline in returns to Scottish rivers was compensated for by a reduction in commercial net fisheries and the adoption of catch and release in many rod-and-line fisheries, resulting in the numbers spawning in rivers remaining relatively constant. However, this buffering capacity has now been fully utilised and post-2011 the continued decline in returning salmon has had an impact on the estimated number of salmon spawning in Scottish rivers. Furthermore, reduced growth at sea has caused a decline in the body size of returning salmon, and therefore egg production per fish, further reducing the total numbers of eggs deposited by the spawners.

Marine Scotland Science collects and collates salmon fishery statistics annually as part of a time series that began in 1952.<sup>2</sup> Total rod catch of salmon has generally declined from its peak in 2010. The proportion of fish caught and released rather than being killed, has increased since the mid-1990s and accounted for over 90% of the total rod catch in each of the last 3 years (Fig. 2).

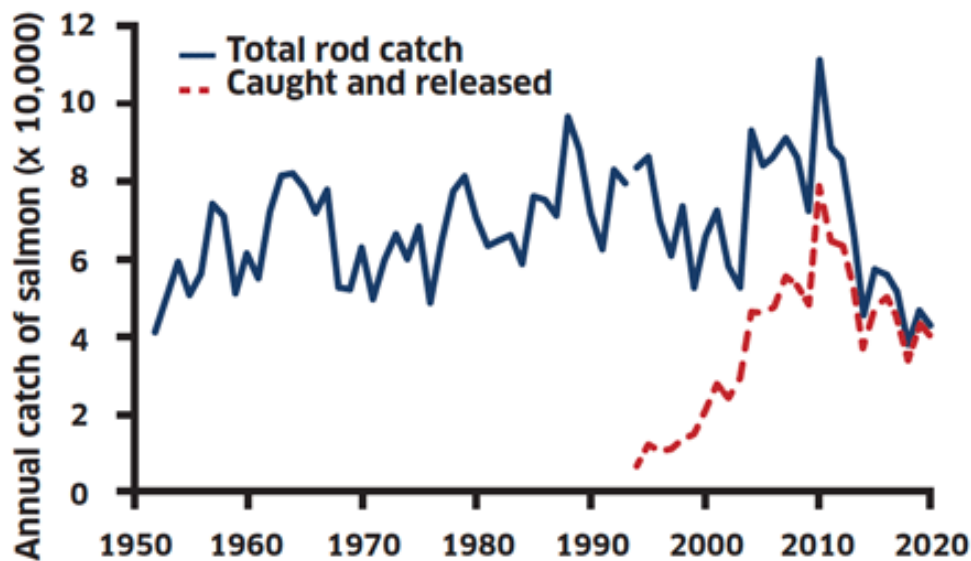


Figure 2: Salmon rod fishery statistics 1952-2020. Total rod catch (blue line) includes salmon caught and released, which has been recorded since 1994 (red dotted line).

The management of salmon fisheries is supported by an annual assessment of the conservation status of salmon in inland waters. The assessments combine catch returns, fish counter data and environmental factors to assign each river (or groups of rivers where catch data cannot be assigned to individual rivers) a grading based on the probability of achieving its Conservation Limit.<sup>3</sup>

The most recent assessment (for the 2022 fishing season) classifies over half of assessed rivers or groups of rivers (101 out of 173) as being in poor conservation status (Grade 3).<sup>4</sup> The retention of salmon is prohibited in Grade 3 rivers, and catch and release is strongly encouraged in Grade 2 as well as in many Grade 1 rivers.

### 3.1 Protected status

Atlantic salmon is a protected species and is subject to international conventions as well as national laws and policy:

- The UN Convention for the Conservation of Salmon in the North Atlantic Ocean established the North Atlantic Salmon Conservation Organization (NASCO)<sup>5</sup>, which seeks to promote the conservation, restoration, enhancement and rational management of salmon stocks through international consultation and cooperation, taking into account the best scientific evidence available.

<sup>2</sup> [Salmon fishery statistics: 2020 - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>3</sup> [Conservation of wild salmon - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>4</sup> [Salmon fishing: proposed river gradings for 2022 season - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>5</sup> [NASCO](http://www.nasco.org)

- Atlantic salmon are included on the OSPAR list of threatened and/or declining habitats and species, in all the areas where it occurs (OSPAR regions I, II, III and IV)<sup>6</sup>.
- Atlantic salmon are listed in Annexes II<sup>7</sup> and V<sup>8</sup> of the EU Habitats Directive. There are 17 Special Areas of Conservation (SACs) for Atlantic salmon in Scotland. Of these, 11 are designated with salmon listed as a primary qualifying interest. These SACs apply to fresh water only (Fig. 3).
- Atlantic salmon are on the Scottish Biodiversity List<sup>9</sup>, a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. Ministers have also assigned Priority Marine Feature<sup>10</sup> status to salmon, in terms of the marine component of their lifecycle, in Scottish territorial waters.

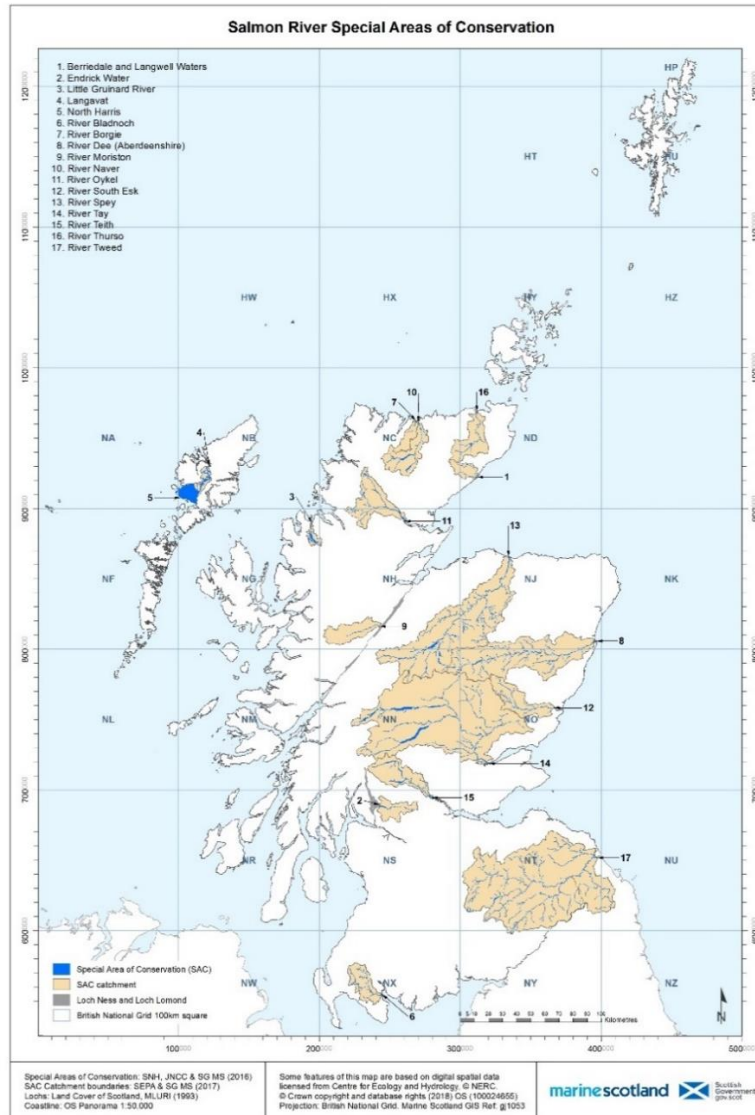


Figure 3: Salmon river Special Areas of Conservation

<sup>6</sup> [Salmon | OSPAR Commission](#)

<sup>7</sup> Annex II of the Habitats Directive identifies animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation.

<sup>8</sup> Annex V of the Habitats Directive identifies animal and plant species of community interest whose taking in the wild and exploitation may be subject to management measures.

<sup>9</sup> [Scottish Biodiversity List | NatureScot](#)

<sup>10</sup> [Priority marine features in Scotland's seas | NatureScot](#)



### 3.2 Value of wild Atlantic salmon

Through fisheries and wider nature tourism, salmon are a key component of the rural economy. The latest Scotland-wide economic assessment of wild fisheries (which is dominated by salmon and trout angling) indicated around £135m of angler expenditure, 4,300 full-time equivalent jobs and £79.9m Gross Value Added<sup>11</sup>. Although the intervening years have likely seen a downward trend in these figures, in part due to declining stocks and prohibitions on fishing activities to aid stock recovery, the overall value of Scotland's salmon remains significant.

The value of salmon to society can also be considered in terms of their 'non-use value' linked to their role in the ecology of aquatic ecosystems and as an indicator of high environmental quality. Salmon play a vital role in the functioning of aquatic ecosystems as both predator and prey. The critically endangered freshwater pearl mussel (*Margaritifera margaritifera*) is dependent on salmon (and brown trout) as a host for the larval stage of its complex life cycle. Through their migration, salmon transfer nutrients from the marine environment into freshwater ecosystems.

Many people consider that salmon and their conservation make a major contribution to their quality of life through the provision of fishing experiences and nature-rich places and it is clear that the Scottish public place importance on the 'existence value' of simply having salmon present in our rivers. Historically important as a food resource, salmon have deep cultural connections throughout Scotland and have inspired art and folklore. The remarkable migrations of salmon make them a symbol of strength in the face of adversity, and they feature on the coats of arms of both the City of Glasgow and the Royal Burgh of Peebles.

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<sup>11</sup> PACEC. 2017. An Analysis of the Value of Wild Fisheries in Scotland. Available at: <http://www.gov.scot/Topics/marine/Salmon-Trout-Coarse/fishreform/sectorvalue>

## 4. Pressures on wild Atlantic salmon

Salmon have complex habitat requirements that vary over their life cycle. Changes to the quantity and quality of habitat, feeding opportunities and predation pressures can have substantial impacts on salmon survival, growth and population status in rivers, estuaries, and the open ocean. A brief description of each of these pressures is provided below. In most cases pressures do not operate independently of one another but act in conjunction to negatively impact salmon survival and can be amplified by climate change effects.

### Exploitation

Salmon suffer direct and indirect mortality through legal and illegal forms of fishing, including rod-and-line, coastal and in-river net fisheries. Voluntary catch and release measures, changes to annual close times to protect vulnerable spring stocks and, since 2016, statutory prohibitions on the killing of salmon in coastal waters and certain inland waters have reduced fisheries-related mortality in recent years. Mortality can also occur through catch and release fisheries, exacerbated by high temperatures.

### Predation

Salmon are consumed by many species of predator. Those considered to present the greatest risk include other fish (e.g., trout, pike, eels), birds (e.g., cormorants, goosanders) and mammals, including seals. The effects of predation can be exacerbated in the presence of anthropogenic pressures including barriers and impoundments that alter habitats and disrupt salmon migration.

### Disease and parasites

Salmon can be host to a wide range of pathogens and parasites that can affect growth and survival. Diseases can be bacterial (e.g., Furunculosis) and viral (e.g., infectious salmon anaemia). Red Vent Syndrome (RVS) caused by the parasite, *Anisakis*, has been highlighted as a cause for concern in recent years.

### Sea lice

Sea lice are a naturally occurring parasite of wild fish that impair performance and can kill salmon smolts<sup>12</sup> above threshold levels. Salmon farms can substantially elevate levels of sea lice in coastal habitats and potentially increase risks to wild salmon growth and mortality under some local conditions.

### Genetic introgression

Escaped farmed Atlantic salmon can negatively impact wild Atlantic salmon through direct competition in fresh water. Breeding of escaped fish with wild Atlantic salmon can disrupt adaptive genetic selection with negative consequences for fitness and thus the viability of wild populations.

### Invasive non-native species

Species introduced outside of their native range (e.g., North American signal crayfish, American mink, pink salmon) can have direct (e.g., predation, competitive exclusion) and indirect (e.g., habitat alteration) negative effects on Atlantic salmon populations. Non-native plants (e.g., giant hogweed, Japanese knotweed) may have impacts on salmon by their effect on river bank erosion.

### Water quality

Salmon require clean, well oxygenated water to thrive. Point source (e.g., septic tanks or licensed discharges) and diffuse (e.g., acidification, eutrophication, sedimentation) pollution can cause

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<sup>12</sup> A smolt is a young salmon at the stage when it migrates from freshwater to the sea.

direct mortality, or stress that affects subsequent growth and survival. Fine sediment can alter the suitability of habitats and suffocate eggs.

### **Water quantity**

Salmon prefer specific water flow characteristics, including depth and velocity, that vary across life stages. Too little water can reduce the availability and suitability of river habitat, causing increased mortality. Too much water can affect feeding success or in extreme circumstances displace fish from habitats.

### **Thermal habitat**

Salmon are a cold water adapted species that are highly sensitive to river temperature. Temperatures may be elevated broadly due to climate change and locally due to point source thermal effluents from industry and discharges from dams, which in some instances may alternatively have a cooling effect. During the warm summer of 2018, about 70% of Scotland's rivers experienced temperatures that could cause stress in salmon.

### **Instream and riparian habitat**

Riparian (river-side) habitat affects water quality, temperature, food availability and channel shape and structure. The loss of natural riparian woodland can increase temperatures and have other detrimental impacts, while excessive over-shading by commercial forestry can reduce instream salmon growth and numbers and exacerbate acidification.

The physical characteristics of rivers and their banks (riparian zone), including the shape of the river channel and the bed material (substratum), affect hydraulic conditions and the availability of shelter and refuges for salmon. Engineering activities, such as straightening, dredging and bank reinforcement, can negatively affect the quality and quantity of salmon habitat.

### **Obstacles to fish passage**

Man-made barriers to migration, including dams, weirs, bridge foundations and culverts can completely prohibit the migrations necessary to complete the lifecycle of salmon. Where barriers are partial, they can impede salmon migration, deplete energy reserves of the fish, and increase the likelihood of predation and illegal exploitation.

### **Marine development**

Activities in the marine and estuarine environments, including dredging and maintenance of harbours, have the potential to affect salmon through impacts on water quality and noise. Marine renewable developments also may affect salmon through noise, impacts on water quality, strike (in the case of turbines) and effects on local direct electromagnetic fields used by fish for migration.

### **High seas**

Growth and survival of Atlantic salmon on the high seas may be influenced by predators, food availability, fisheries, and costs of metabolism. Climate change has elevated sea surface temperatures, influencing metabolic costs directly and potentially affecting growth and survival of Atlantic salmon indirectly through changes in the ecosystem and hence food availability and/or predation risk.

### **Other pressures**

Potential pressures as diverse as numbers of terrestrial insects falling into streams and activities of inshore fisheries might have significant impacts on salmon growth and mortality, have probably changed over time but have not been assessed.

## 4.1 Assessing impacts of pressures

In some cases, the impact of a pressure at a given location is unequivocal, for example where a dam fully obstructs the passage of salmon. However, in many if not most cases, there is uncertainty regarding impact level. In some instances, it may be possible to quantify an impact within confidence bands through experimentation, but this is seldom the case, and results may not be transferable and generalisable. Mathematical modelling can be an important tool for predicting impacts and generalising results transported from specific local experimental assessments. Expert opinion has played an important role in combining evidence and judgement into frameworks for pragmatic management of pressures. Fisheries Management Scotland together with Scottish Government have produced a *Pressures Tool* that uses local expert opinion to collate impressions of the relative extents of and regional variations in the pressures affecting Atlantic salmon (for publication in 2022).

A key principle in managing pressures is to use the best available scientific evidence, whilst taking into account scientific uncertainty (through the precautionary principle). Adaptive management is an important approach for refinement whereby outcomes of management interventions are monitored and fed back to refine subsequent actions.

## 5. Priority themes for action

Considering the pressures on salmon described above together with our international obligations and legal requirements, we have identified **five broad priority themes for action** supported by a strong evidence base underpinned by coordinated scientific research and monitoring. These areas for action will form the framework for co-ordination of Government and stakeholder action and partnership working over the next decade. For each priority area for action, we have included some illustrative examples below. However, it is important to emphasise that this section does not set out an exhaustive list of actions – the actions to be covered under Scotland's Wild Salmon Strategy will be set out in full in the subsequent Implementation Plan.

Mortality at sea appears to be a major factor in the widespread decline of salmon across its North Atlantic range. Although the exact underlying mechanisms are unclear, it is likely that climate change driven alterations in oceanic processes and the effect on prey availability are key factors. While the Scottish Government is committed to end our contribution to greenhouse gas emissions by 2045 as part of global efforts to limit warming to 1.5°C, our immediate management approach needs to focus on building resilience in salmon populations to widespread climate-induced effects.

Relative to the wider marine environment our understanding of pressures and ability to take action is greater in freshwater and coastal environments. Therefore, we are clear that optimising the number and quality of healthy, naturally produced salmon smolts leaving Scotland's rivers and coastal areas is of principal importance to achieving our objectives. Nevertheless, we will work with international partners through NASCO and other fora to alleviate pressures on the High Seas, for example, due to illegal fisheries, should opportunities arise.

- **Improving the condition of rivers and giving salmon free access to cold, clean water**

The focus on this priority action is to address a range of pressures acting on the freshwater environment. By ensuring that salmon have free access to suitable habitat, and by maximising the quality and availability of habitat, there is considerable scope to increase smolt output from our rivers. It is vital that focussed management actions which increase the resilience of our rivers to climate change are prioritised. Many of the pressures on our

water environment arise from the way that we use and manage activities on land. A coordinated catchment-scale approach will therefore be required to protect and restore natural river processes. With its existing responsibilities for delivering many of the objectives set out in Scotland's River Basin Management Plans (RBMPs), SEPA has a key role to play in ensuring that no further deterioration in our water environment occurs, and in requiring or indeed taking action to improve the water environment. We also have an opportunity to build on the extensive expertise of fisheries and land managers to support improvements being delivered at greater pace and scale. As part of the Implementation Plan, we will identify opportunities for public and private sector interests to work in close collaboration to deliver this vital work. Whilst this priority area for action will benefit salmon populations through improvements to aquatic habitat, it is important to recognise that this package of work will have wide-ranging benefits for Scottish biodiversity.

Actions include:

- Meeting or exceeding all WFD targets/actions on water quality, quantity, in-river habitat and barrier easement. This requirement will include SEPA carrying out a review of existing CAR licences to improve fish passage at a range of active operations including distilleries, public water supply and hydropower; scheduled programme of barrier removal at historic/redundant sites to be completed by 2027.
  - Following a consultation in 2021, SEPA will take a new approach to addressing water scarcity, with greater management of water abstraction which will address or minimise impacts of drought conditions on salmon.
  - Undertaking assessments and assemble case studies to determine possible gaps where achievement of RBMP targets may not provide adequate protection for salmon at local and/or national scale.
  - Improving climate resilience of rivers, for example through supporting targeted riparian tree planting and natural regeneration and peatland restoration.
  - Incentivising habitat improvement projects, such as sustainable riverbank protection, installation of large woody structures and re-connecting natural flood plains.
  - Preventing and mitigating the introduction, establishment and spread of invasive non-native species.
  - Undertaking a review of fish-eating bird policy with a view to ensuring balanced consideration of the conservation status of predator and prey species and informing the proposed wider review of the species licensing system.
- **Managing exploitation through effective regulation, deterrents, and enforcement.**

Fishing, and particularly angling for salmon, is an iconic image that many associate with Scotland. Much of the original Victorian era salmon fishing legislation was brought together in the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003, but there have been significant changes in the years since, aimed at protecting salmon in our coastal and inland waters. These actions include a ban on the sale of rod-caught salmon, changes to extend the annual close times to protect spring stocks of salmon, and the 2016 salmon conservation regulations which prohibited the retention of salmon caught in coastal waters and inland waters where conservation status is low. Local management of rivers and fishing by District Salmon Fishery Boards (DSFBs) and Rivers and Fisheries Trusts remains a key component of Scottish salmon fishing, with enforcement of national and local regulations by water bailiffs, appointed by DSFBs and Ministers.

In addition to delivering extremely high levels of catch and release, anglers are often the 'eyes and ears' on our riverbanks, reporting illegal activities and pollution incidents and

actively working with others to improve habitats and protect our aquatic environment. We want to build on this expertise and enthusiasm and ensure that anglers are fully engaged in the delivery of this Strategy.

Actions include:

- Continuing to revise and apply the annual salmon conservation regulations.
  - Maintaining the prohibition of the retention of salmon in coastal waters until such time as the conservation status of salmon allows for the consideration of removing the measure.
  - Reviewing the annual close times across Scotland.
  - Undertaking a review of enforcement powers, the offences and penalty regime for salmon poaching and other offences, aiming to increase penalties if necessary.
  - Supporting the training of water bailiffs and raising awareness of wildlife crime, in partnership with Fisheries Management Scotland, Police Scotland, and the Crown Office and Procurator Fiscal Service.
- **Understanding and mitigating pressures in the marine and coastal environment.**

A number of activities and pressures in the marine environment may impact on populations of salmon. Scotland's National Marine Plan<sup>13</sup> sets out the strategic policies for managing Scotland's seas to achieve the vision of *Clean, healthy, safe, productive and diverse seas; managed to meet the long term needs of nature and people*. Through the National Marine Plan (and where relevant Regional and Sectoral Marine Plans), the impact of development and use of the marine environment on salmon is considered in marine planning and decision-making processes. Alongside this, the National Planning Framework<sup>14</sup> includes planning policies for sustainable aquaculture designed to safeguard migratory fish species including salmon.

There have been significant efforts aimed at improving our understanding and mitigating the negative interactions between farmed and wild salmon. The Scottish Government's response to the recommendations of the Salmon Interactions Working Group<sup>15</sup> sets out a programme of work to ensure that the impacts and risks presented by fish farming to wild salmonids are minimised. Further, the Shared Policy Programme<sup>16</sup> agreed as part of the ground-breaking agreement between the Scottish Government and the Scottish Green Party includes an ambitious aquaculture agreement and commits to a step change in how we manage the marine environment.

In addition, a suite of ongoing and new national initiatives including the UK Marine Strategy, Scotland's Future Fisheries Management Strategy, and the further development of Scotland's Marine Protected Area network aim to build and support healthy, robust marine ecosystems that will in turn benefit salmon in Scottish waters.

Actions include:

- Implementing the programme set out in the Scottish Government's response to the Salmon Interactions Working Group.

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<sup>13</sup> [Scotland's National Marine Plan - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/national-marine-plan/pages/1-introduction.aspx)

<sup>14</sup> The draft Fourth National Planning Framework (NPF4) is under consultation at time of writing [National Planning Framework | Transforming Planning](#)

<sup>15</sup> [Salmon Interactions Working Group Report: Scottish Government Response - gov.scot \(www.gov.scot\)](#)

<sup>16</sup> [Scottish Government and Scottish Green Party: draft shared policy programme - gov.scot \(www.gov.scot\)](#)

- Maintaining the presumption against further marine fish farm developments on the north and east coasts.
  - Safeguarding salmon through National, Regional and Sectoral Marine Plan policies, and licensing of marine activity and development, recognising its status as a Priority Marine Feature.
  - Protecting and enhancing marine biodiversity, including salmon and the habitats they depend on, through a well-managed network of Marine Protected Areas, proposed Highly Protected Marine Areas and other conservation measures.
  - Implementing the UK Marine Strategy to achieve or maintain Good Environmental Status.
- **Making a positive contribution through international collaborations**

In parallel to our actions close to home we must also support international efforts to ensure the survival of salmon beyond our jurisdiction. The Convention for the Conservation of Salmon in the North Atlantic Ocean is a multilateral agreement which came into force in 1983. Its aim is to promote the conservation, restoration, enhancement, and rational management of salmon stocks in the North Atlantic through international co-operation. NASCO, the North Atlantic Salmon Conservation Organisation, is the international organisation established by the Convention and is responsible for devising regulatory measures in distant-water fisheries at West Greenland and the Faroe Islands (ocean feeding grounds for salmon of Scottish origin). Following the UK's withdrawal from the European Union the UK is now a full party to the Convention, having previously been represented through the EU. The Scottish Government therefore has obligations to, and contributes to the work of, NASCO and we report annually on the implementation of NASCO's Resolutions, Agreements and Guidelines under our jurisdiction.

OSPAR is the mechanism by which 15 Governments and the EU cooperate to protect the marine environment of the North-East Atlantic. It has complementary competences to NASCO in the protection of marine ecosystems in the North-East Atlantic and ensures the protection of priority species and habitats through its own programmes and measures or through cooperation with other international authorities. We also contribute to the work of ICES<sup>17</sup> the body responsible for coordinating marine science and marine scientific advice on salmon fishing in the North Atlantic.

Actions include:

- Playing an active role in the effective functioning of NASCO and the development and implementation of NASCO resolutions, agreements and guidelines.
- Working as part of the UK delegation to NASCO to support evidence-based regulation of distant-water marine fisheries at West Greenland and the Faroe Islands.
- Contributing to improved scientific understanding through participation in the ICES Working Group on North Atlantic Salmon.
- Contributing to monitoring and surveillance activities, information exchange and development of recommendations to prevent parasite spread (e.g. as part of NASCO North East Atlantic Commission *Gyrodactylus salaris* working group).
- Implementing OSPAR Recommendation 2016/3<sup>18</sup> on furthering the protection and conservation of the Atlantic salmon.

<sup>17</sup> [WGNAS \(ices.dk\)](http://wgnas.ices.dk)

<sup>18</sup> [OSPAR Recommendation 2016/3 on furthering the protection and conservation of the Atlantic salmon \(\*Salmo salar\*\) in Regions I, II, III and IV of the OSPAR maritime area \(ospar.org\)](#)

- **Developing a modernised and fit for purpose policy framework**

Scotland has 41 District Salmon Fishery Boards (DSFBs), including the River Tweed Commission. DSFBs are constituted and governed under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003<sup>19</sup> ('the 2003 Act'), whereas the River Tweed Commission operates under The Scotland Act 1998 (River Tweed) Order 2006<sup>20</sup>.

DSFBs have statutory powers and duties to protect and improve salmon fisheries within their legally-defined salmon fishery districts, and have powers to raise money to fund fisheries management (through a levy system) and to appoint water bailiffs. Water bailiffs operate under the powers conferred by the 2003 Act to prevent the illegal taking of salmon or trout.<sup>21</sup>

There are also 25 charitable Rivers and Fisheries Trusts in Scotland. Trusts (and some DSFBs) monitor young fish and returning adults to help understand how important local pressures impact the aquatic environment. In other cases, fisheries managers work to collect information which is then applied at local, national and international levels. The rivers and fisheries trusts across Scotland are increasingly working at catchment-scale to deliver vital habitat improvement and restoration works. Trusts often work in partnerships with the District Salmon Fishery Board(s) which cover the same catchment(s) to manage and conserve Scotland's fisheries resources.

At the heart of the existing policy framework lies a balance between local management by DSFBs and Trusts and national leadership by the Scottish Government. Some aspects of this framework date back to legislation from the 1860s, and have their roots in an approach that revolves around the management of salmon fishing rights as opposed to the stewardship of the fish and their habitats. Legislation has been consolidated, amended and expanded many times over the years and there is a complex system of regulation and compliance that has evolved over time, including for example seasonal restrictions (annual close times) and weekly close times.

In developing a modern framework that supports local managers in conserving wild salmon we will consider the rights of fisheries, the role of DSFBs as well as the requirement to protect the species. At the same time we also will aim to preserve flexibility so that changing policy priorities and unforeseen impacts can be promptly and successfully dealt with in the future.

We recognise the importance of local management, and we want to build on the effective links that have been developed between central Government and local management in recent years. Government has international obligations relating to salmon conservation, develops national policy and funds and coordinates large scale scientific research & monitoring networks. Local management sets and delivers local priorities, including protection of salmon populations, undertaking local research and contributing to coordinate national research and monitoring as well as contributing to national policy development.

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<sup>19</sup> [Salmon and Freshwater Fisheries \(Consolidation\) \(Scotland\) Act 2003 \(legislation.gov.uk\)](#)

<sup>20</sup> [The Scotland Act 1998 \(River Tweed\) Order 2006 \(legislation.gov.uk\)](#)

<sup>21</sup> A few areas including for example Clyde, Irvine and Garnock, and Mull do not have DSFBs but manage their fisheries through other means, with water bailiffs appointed by Scottish Ministers.



**We will examine ways in which we can better support local management.** Currently, DSFBs are funded through the fishery assessment, which is a form of non-domestic rate. At the request of the DSFB, local authority district assessors value the salmon and sea trout fisheries within that district. This valuation is largely based on the declared catches within each fishery. The fishery assessment currently raises around £4m each year but declining catches have placed significant pressure on this source of income. These issues have been exacerbated by the effects of Covid-19.

Stable and consistent income streams are a significant challenge for rivers and fisheries trusts, which raise funds through a variety of means. Often core funding is provided by DSFBs from the fishery assessment, but public funds from a range of sources generally aimed towards habitat improvement work, third sector charitable funding and private sector contributions are a vital component of the funding of trusts.

Working with stakeholders **we will consider a broad review of the policy framework** with the aim of improving the protection of salmon and ensuring enhanced environmental, economic, and social benefits arising from it. As part of the review we will explore new means to improve investment in Scotland's rivers. We will use experience from other countries to inform a reformed funding mechanism for salmon conservation and fisheries management in Scotland. This will also include investigating private sector contributions, and the willingness by firms to dedicate funds as part of their corporate, social and environmental responsibility.

## **6. Building an evidence base through coordinated scientific research and monitoring**

Scientific research and monitoring have been critical for providing an evidence base to inform contemporary management of Atlantic salmon. In broad terms, recent central support from Scottish Government has focussed on stock assessment, aspects of climate change impact, and promoting sustainable development of renewable energy and aquaculture production. Historically, Scottish and UK Governments have supported understanding of the impacts of many pressures including predators, dams, water discharge, habitat quality and certain invasive species. Research has also been supported from a wide range of sources, including charities (such as the Atlantic Salmon Trust), the European Union, the UK Research Councils (such as the Natural Environment Research Council) and industries including the renewable energy and aquaculture sectors.

In supporting this Strategy, the Marine Scotland Science research programme will provide crucial evidence for policy development at a national scale and for management action at local level with a strong focus on the monitoring and assessment outputs needed to achieve substantial tangible outcomes. The salmon conservation regulation assessment will continue to classify status of salmon at a river scale wherever possible, supported by enhanced collection of rod catch data via an interactive database and construction of an extended fish counter network. These outputs will be used to regulate the killing of salmon by fisheries as well as informing regulation of pressures, including marine developments.

The National Electrofishing Programme for Scotland (NEPS) will give site-level and regional assessments to determine how saturated areas are with young salmon to supplement the conservation regulation assessment for management of pressures. In addition, the National Introgression Programme for Scotland (NIPS) will dovetail with NEPS to provide a balanced evaluation of the extent that salmon populations become polluted with genetic material associated with escaped salmon from fish farms. Work on the west coast of Scotland to develop a system for assessing sea lice risk to sea trout will include evaluation of models underpinning SEPA's proposed Sea Lice Risk Assessment Framework for salmon as part of an adaptive management

process. Spring salmon, those that return to rivers early in the year, have had the sharpest decline in numbers and will be a focus for assessment and restoration efforts.

Marine Scotland Science will continue to provide modelling to enable targeted tree planting and land management to mitigate effects of climate change on salmon in freshwater habitats and will maintain unique long-term data series relating stream temperatures and flow to production of juvenile salmon. Marine Scotland Science will also continue to support assessments of risk and mitigation options to facilitate sustainable development of Scotland's marine renewable and aquaculture industries with respect to salmon. These actions will support development of the Blue Economy while responding to the twin priorities of climate change and the biodiversity crisis.

Support from National Research Councils along with the private, charitable and industrial sectors will be required to generate new information to assess impacts of other specific pressures and to develop management measures. Scottish Government will contribute to the coordination and facilitation of targeted management actions, building on the work of the Scottish Fisheries Coordination Centre to harmonise processes and encourage data sharing.

## 7. Implementation

The Scottish Government will support the implementation of this strategy. However, the vision and objectives cannot be achieved by government alone. Thankfully, there are many examples of strong partnerships already working across public, private, and charitable bodies that serve as a model on which to build. We will establish a cross-government and stakeholder group to advise on and support implementation, with the aim of publishing a detailed implementation plan no later than 12 months from publication of this strategy. We will report on progress regularly as determined by the implementation plan process.

We will also continue to work jointly on areas of common interest with our counterparts in the UK Government, the Welsh Government and the Northern Ireland Executive.

In accordance with duties on Scottish Ministers and public bodies our approach will have due regard to the guiding principles on the environment set out in the UK Withdrawal from the European Union (Continuity) (Scotland) Act 2021.

### Integrated policymaking

This Strategy, the priorities and the specific actions we will take in its implementation do not exist in isolation. Many existing policies and investments that aim to ensure Scotland plays its full part in responding to the nature and climate crises (e.g. changes to upland management and peatland restoration) will deliver improvements to Scotland's aquatic environment, which will in turn benefit salmon. Equally, delivery of this strategy will provide wider societal benefits and contribute towards achieving National Outcomes<sup>22</sup> on the environment and helping to mitigate and adapt to climate change.

Scotland's Environment Strategy sets out our long-term strategic ambitions and policy priorities for the environment and provides an overarching framework for all of Scotland's environmental strategies and plans. Within this framework, this strategy will complement and be reflected in the delivery of other plans and strategies such as Scotland's Land Use Strategy, the Biodiversity Strategy, the Climate Change Plan, River Basin Management Plans, Scotland's Forestry Strategy, the National Marine Plan and the National Planning Framework.

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<sup>22</sup> [Environment | National Performance Framework](#)

In addition, this strategy comes at a time of considerable change in the global and national level policy frameworks required to tackle the twin crises of climate change and biodiversity loss. This includes the new post-2020 framework for biodiversity to be agreed at the Convention on Biological Diversity (CBD) Conference of Parties (COP) 15 in spring 2022, which will set new goals and targets for the global community. This will provide a key reference point for a new Scottish biodiversity strategy that will be published later in 2022.

The Scottish Government has also committed to introduce a Natural Environment Bill to the Scottish Parliament, which will include targets for nature restoration based on an overarching goal of preventing any further extinctions of wildlife and halting declines by 2030 and making significant progress in restoring Scotland's natural environment by 2045.

We will respond and adapt to this evolving policy context in our plans for implementation and thereafter through regular review. In the development of future relevant policies – including those highlighted above - we will identify opportunities for supportive actions that will aid the delivery of our ambition for salmon, and to identify where salmon conservation can contribute to the aims and objectives of other policies.

### Measuring progress

Measurable sustained improvements in Scottish salmon populations will not be apparent for some years. As part of our implementation plan, we will develop a suite of measures that when considered together will allow us to track progress and evaluate the impact of our interventions. This is likely to use existing data collection and assessment schemes and could include for example: salmon river gradings under the annual conservation regulation assessment bolstered by an extended salmon counter network; status assessments of juvenile salmon stocks (NEPS); the ecological status of rivers through RBMP assessment; site condition monitoring of designated protected areas for salmon; analysis of socio-economic benefit.

### Review

The immediate outlook for this strategy is to 2030 in alignment with the timeframe of wider initiatives including the post-2020 biodiversity framework. However, bearing in mind key elements such as the third RBMP cycle runs to 2027 and NASCO Implementation Plans to 2024, we will consider the establishment of intermediate review points to assess progress and to ensure coherence with wider environmental policy frameworks and laws.

Additionally, our understanding of the drivers of salmon population declines may change as new evidence emerges and we must keep these under review and adapt our management response accordingly.

## **Annex**

The following organisations have made valuable contributions to the development of this strategy through their membership of the Wild Salmon Strategy Stakeholder Advisory Group.

Atlantic Salmon Trust  
Fisheries Management Scotland  
Forth Rivers Trust  
NatureScot  
Salmon Scotland (formerly Scottish Salmon Producers Organisation)  
Scottish Anglers National Association  
Scottish Environment LINK/Scottish Wildlife Trust  
Scottish Environment Protection Agency  
Scottish Forestry  
Scottish Land & Estates  
Scottish Renewables/Scottish and Southern Energy  
Spey Fishery Board



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