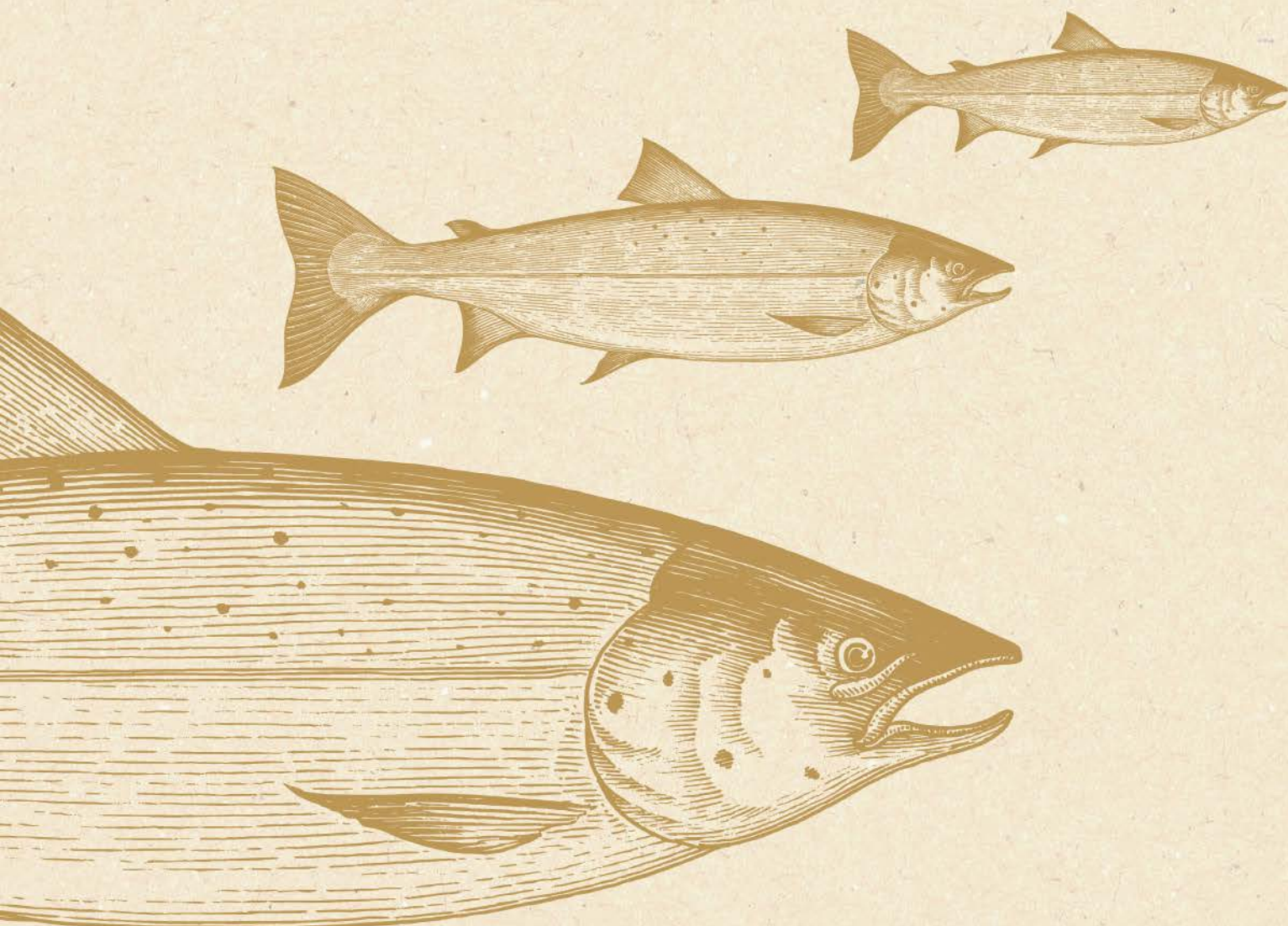


SIX RIVERS PROJECT



The Six Rivers Project is a not-for-profit conservation programme, which seeks to reverse the decline of the Atlantic salmon.

The future of the Atlantic salmon is critically endangered. It is virtually extinct in North America, and already extinct in Germany, Holland and Belgium. Iceland is one of only a handful of countries where the salmon still enjoys healthy rivers - though its future is uncertain.

In a remote corner of North East Iceland we provide some of the finest catch and release salmon fishing in the world. In turn, all proceeds from our exclusive angling experiences are reinvested into urgent conservation work on our rivers.



- 05 Why We're Here: A Critical Time for Conservation
 - The Bigger Picture
 - The Fate of Atlantic Salmon
- 14 About the Six Rivers Project
- 17 Salmon Conservation-Building Understanding
 - Atlantic Salmon Migration Routes
 - The Life Cycle of the Atlantic Salmon
- 21 Reducing Stress on Salmon Populations through Managed Fishing
- 23 Improving Life In The River
 - Egg Planting
 - Improving River Health and Food Sources
 - Use of Ladders
 - Tagging
 - Ongoing Research
 - The Fish
- 34 A Brief History of the Six Rivers Project





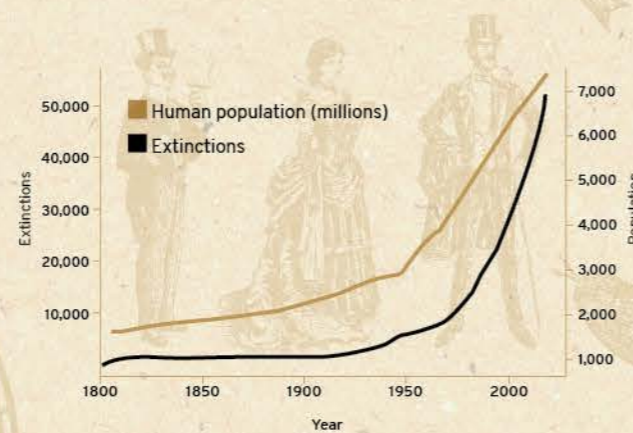
The Bigger Picture

As the human population has doubled over the last 50 years, populations of over 4000 species across the world have, on average, reduced by 60%.

Atlantic salmon, lion, elephant and black rhino have fared worse than the average. This steady increase in species extinction maps against the growth of human populations with alarming correlation.

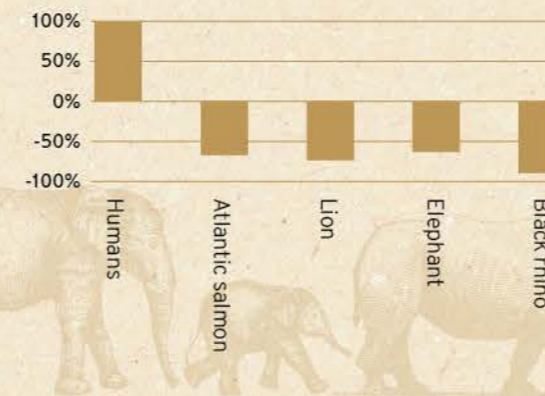
1970-2015

Humans and The Extinction Crisis



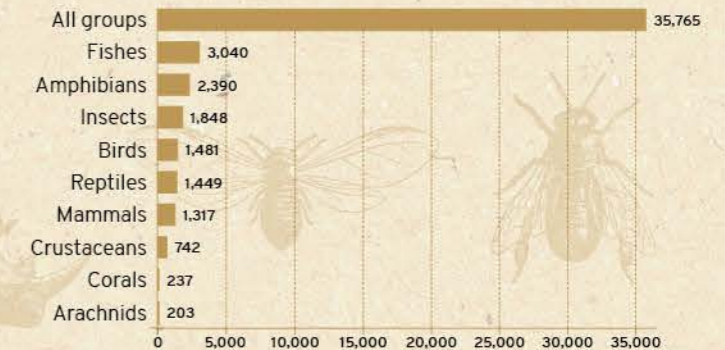
Data source: Scott, J.M. 2008. *Threats to Biological Diversity: Global, Continental, Local*. U.S Geological Survey, Idaho Cooperative Fish and Wildlife Research Unit, University of Idaho.

Changes in Population of Selected Species Between 1970 and 2015



Source: ZSL

Number of Species Threatened with Extinction



Source: IUCN Red List

Note: 'Threatened' species are those that are categorised as 'Critically endangered' or 'Vulnerable' on the IUCN Red List.

The IUCN Red List has assessed only a small share of the total known species in the world. This means the number of species threatened with extinction is likely to be a significant underestimate of the total number of species at risk.

The Fate of *Atlantic Salmon*

Atlantic salmon populations have declined significantly in the last 50 years, linked to a collection of known and predicted threats.



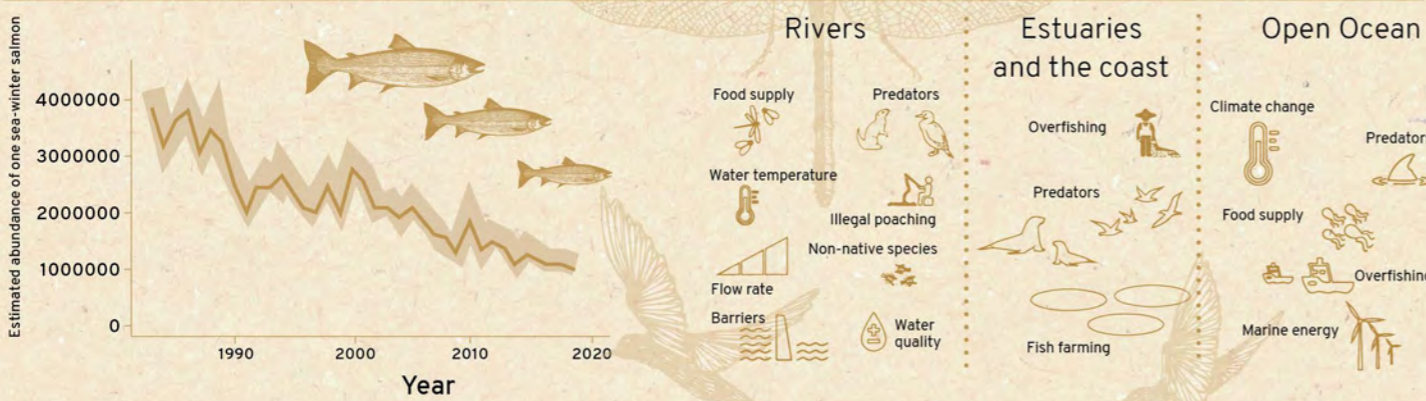
The Fate of Atlantic Salmon

The future of the Atlantic salmon is critically endangered. Populations have declined dramatically over recent years. Catches of Atlantic salmon in 2019 from almost every country were the lowest on record for over 40 years. Accordingly, river stocks are in decline.

Atlantic salmon is virtually extinct in North America and Southern Canada, and is extinct in Germany, Holland and Belgium. Iceland is one of only a handful of countries where the salmon enjoys healthy rivers.

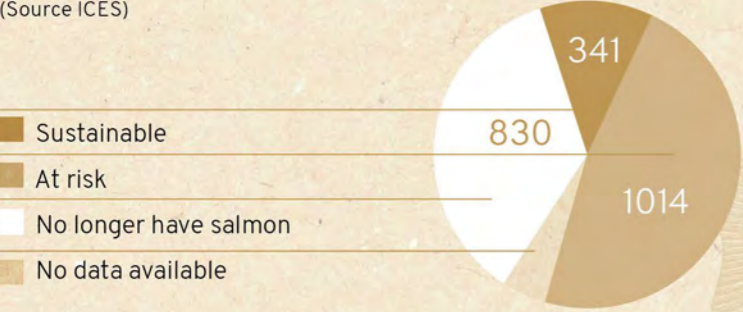
To date, Icelandic stocks have been relatively resilient in the safe haven of the North Atlantic.

But already there is evidence of declining stocks in NE Iceland. The Six Rivers Project is working to reverse this decline, protect this vital habitat and support these critical populations before it's too late.

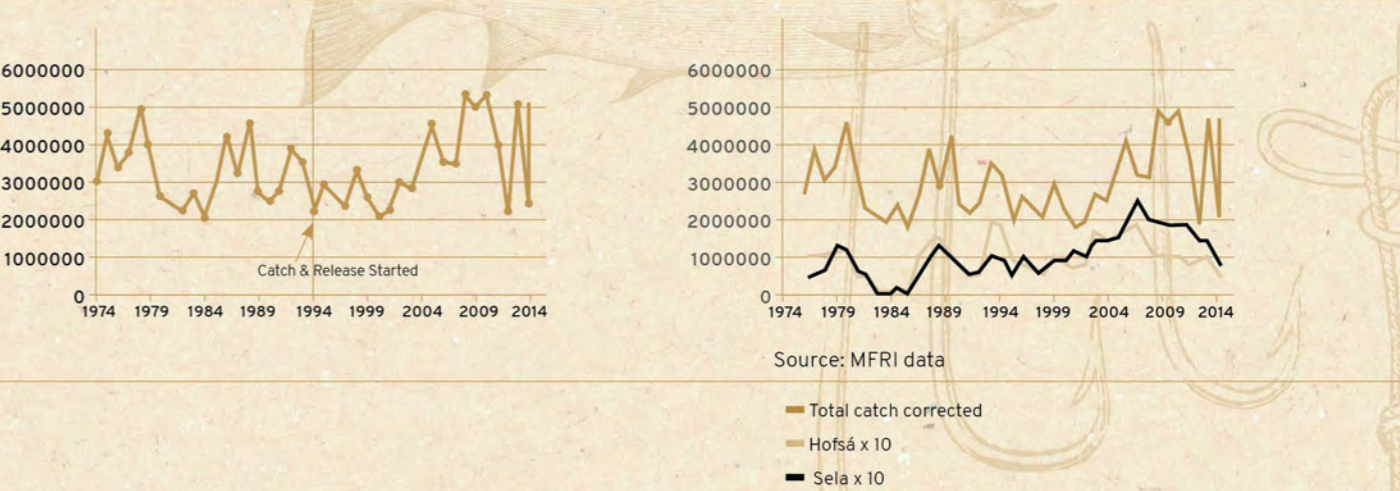


Source: International Council for the Exploration of the Sea

Stock Status for Atlantic Salmon Rivers
Number of 2350 Rivers by Category
(Source ICES)



Atlantic salmon fish stocks in Iceland



We offer some of the worlds best salmon fly fishing from our rivers in Iceland, among them the Selá and Hofsá, with its tributary the Sunnudalsá located in Vopna Fjord on Iceland's east coast - as well as the Miðfjarðará in Bakkafjörður.

About the Six Rivers Project

The Six Rivers

The six rivers which comprise the Six Rivers Project are:

- Selá
- Hofsá
- Sunnudalsá
- Midfjardara
- Vesturdalsá
- (research river only)

The Six Rivers Project is a long-term not for profit conservation programme in Iceland. It exists to invest in local conservation projects along the main salmon rivers in the north eastern part of Iceland, to reverse the decline of the Atlantic salmon population.

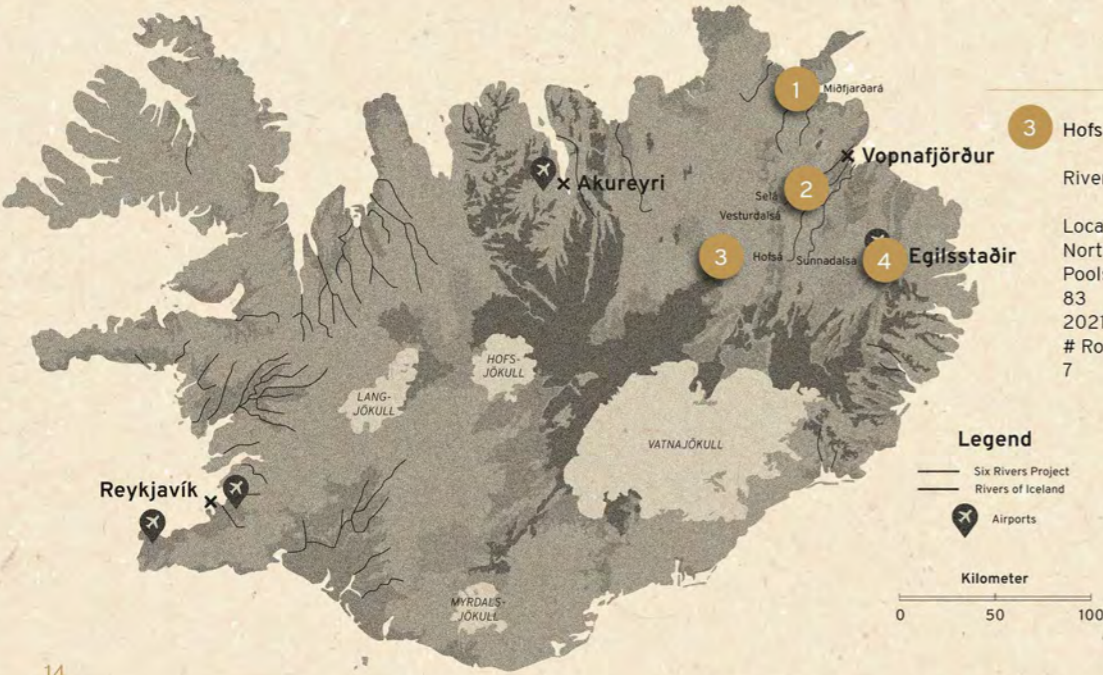
Our objective is to boost the Icelandic salmon population, by working to help nature and interfering as little as possible in the natural environment.

We aim to maximise the number of salmon that successfully breed in our six rivers in a sustainable way.

All proceeds from our exclusive angling experiences are reinvested in salmon conservation activities on our six rivers.

We provide, we believe, some of the finest salmon fishing in the world. It is a key to sustainability.

General Map





Salmon Conservation- *Building Understanding*

The salmon stock in our North East Iceland rivers follow a different oceanic migratory path to the smaller salmon in the west coast rivers near Reykjavik.

Where Do Atlantic Salmon Go at Sea?

Atlantic Salmon
Migration Routes



The first key to effective conservation initiatives is understanding- and while a lot is known about the lifecycles and behaviours of Atlantic salmon populations, a remarkable amount remains to be discovered.

We have therefore established a long term holistic programme which combines fundamental research on how best to help salmon populations, practical interventions to make a difference now, and on-going state of the art monitoring and measuring to understand the impact of what we do.

The research is being done by a joint team from the MFRI, with its unrivalled history of studying salmon in Iceland, and Imperial College London, with its world class ecology and modelling expertise.

We share insights and best practice with experts studying Atlantic salmon around the world, at our annual academic conference.

The Life Cycle of the Atlantic Salmon

1. Spawning

The life cycle starts when, in the spring or summer, mature adults return to their river of origin to spawn. The female lays her eggs in the autumn – around 4,000 of them - in the gravel bed of the river, where they are fertilized by males, and then covered by the female. It takes approximately 3,000 eggs to create one adult salmon.

5. Smolts

The Parr transform themselves into Smolts to enable them to leave the river for the richer food resources of the sea. In the “smolting” process, the fish develop a silvery skin and undergo the physiological changes needed to live in salt water. In The Six Rivers, the “run” of smolts to the estuary takes place in late Spring.

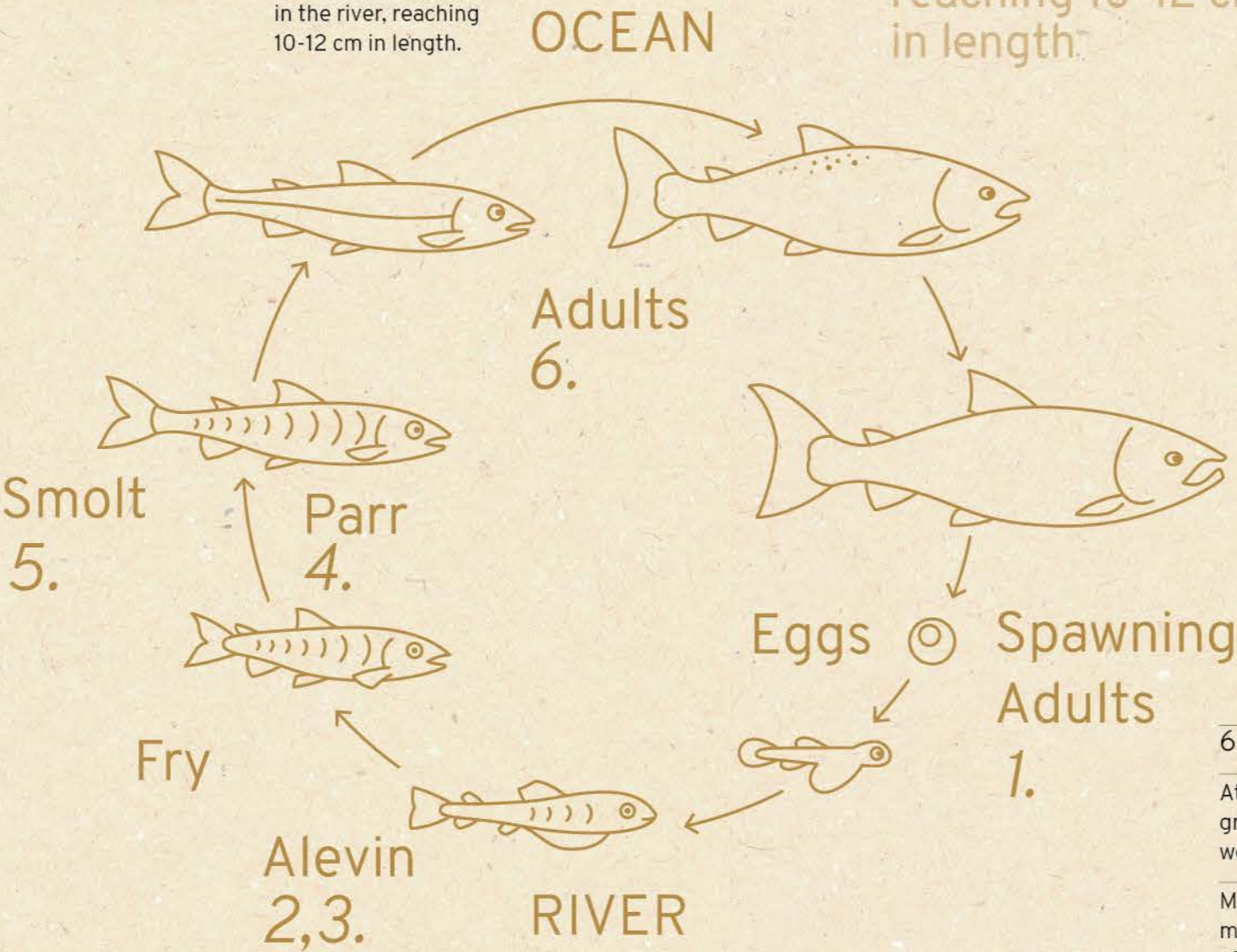
Sources: Anna Hagelin- Conservation of landlocked Atlantic salmon in a regulated river, the Atlantic Salmon Trust and Robin Ade.

4. Parr

Over the summer, they develop into Parr, characterised by their camouflage markings which protect them from predators. In the cooler environment of East Iceland, the Parr typically spend about 3-5 years in the river, reaching 10-12 cm in length.

The Parr typically spend about 3-5 years in the river, reaching 10-12 cm in length.

It takes approximately 3,000 eggs to create one adult salmon



2, 3. Alevin & Fry

Over the winter, the eggs develop into Alevin, and then into Fry. The Fry are mobile and escape the gravel bed to feed in the river.

At sea, the salmon quickly grow from less than 50g

6. Adults

At sea, the salmon quickly grow from less than 50g in weight to over 2kgs.

More than half of the fish mature and return to spawn after just one winter.

Others remain at sea for two winters, and in rare cases, three winters.



Reducing Stress on Salmon Populations through Managed Fishing

The first principle of preservation is preventing damage – and by enforcing rules that limit the amount and type of fishing in our rivers, we significantly reduce the pressure on the salmon. We are confident that by changing traditional fishing habits, we can enhance both the quality of the rivers and improve the life of the fish that inhabit them.

The seven main fishing rules are:

1. 100% catch and release.
2. Reducing fishing hours to four per session so that the maximum fishing time per day is eight hours.
3. All rods on the rivers are guided to ensure that the rules of the river are upheld.
4. Limited daily catch to four fish per rod per session or eight fish per rod per day.
5. Allowing only light fishing tackle. No weighted flies and no sinking lines are allowed. Floating lines only.
6. No hooks larger than a size 10 are used on our rivers.
7. We give all salmon above the second ladder on the Selá a free pass. We want that determined DNA in the river!



Improving Life in the River

Our initial research focus is on understanding how to improve young salmon populations in the river, measuring how many survive their sea journey to return to spawn, and then how successful the spawning is.

We are currently exploring this in four main ways:

- Egg planting
- Improving river health and food sources
- Opening up new river sections using ladders
- Tagging parr and smolts to gather survival and movement data

Egg Planting

We are testing the planting of fertile eggs in the healthiest parts of our rivers, with the hope of increasing successful hatch rates.

In late October/early November 2019, in temperatures of around -10°C , the latest stage of the largest ever North Atlantic salmon egg planting operation was carried out on the upper reaches of the Sela river. 200,000 eggs were planted by the Six Rivers Project with the expert help and guidance of the MFRI, the Icelandic salmon research institute. Undeterred by the icy temperatures, our team intends to return in future years with the long term goal of seeding 1 million eggs each year.

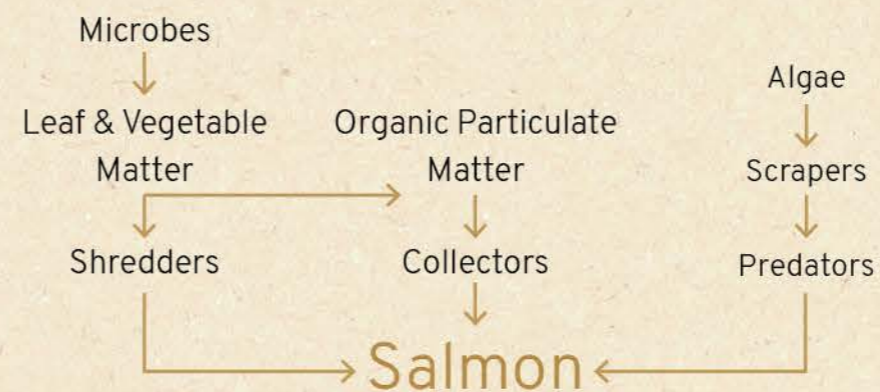
It is difficult to gauge the success rate of this particular programme yet, but tagging and working with university researchers should in time confirm that this initiative will play its part in helping preserve the Atlantic salmon.



Improving River Health and Food Sources

Already we know that food sources for young salmon are scarce and that we need to improve them, for example by enhancing vegetation around the river.

(Note: Salmon eggs hatch into parr. The parr live in the river for 2-5 years approximately. Just before leaving the river, the parr transform into smolt which have gills that work in salt water).



Sela River Catchment
(darker areas show
target areas for new
vegetation)

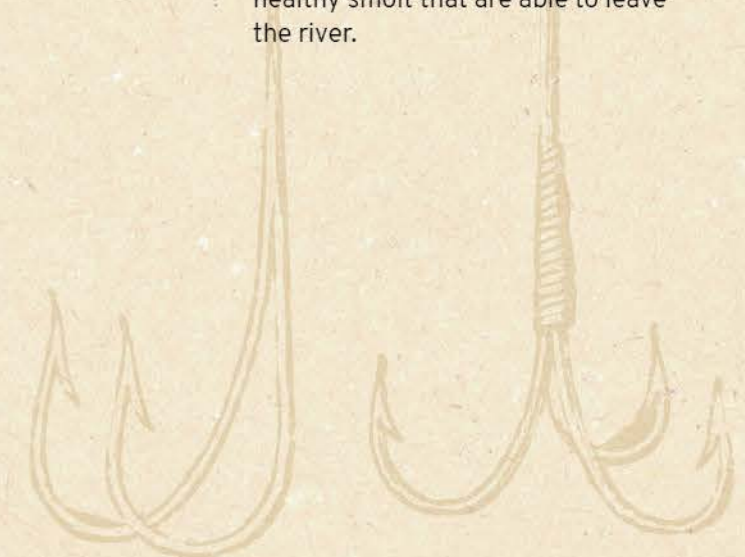


The Salmon Food Chain Starts with Biomass from Vegetation

Our early studies (water sampling, and analysis of salmon food) suggest food is limited in the rivers. Our long-term goal is to increase food resources for young salmon in the rivers by introducing more bioactivity into the ecosystem.

To increase food supply we are investing in increasing the biomass in the rivers over long term, by planting more trees and shrubs between smaller side rivers and by main river. This collaboration with the Vopnafjörður municipality also reduces soil erosion and contributes to overall river health.

In the summer of 2020 about 10,000 plants were planted. The new plants are nearly all locally sourced in Iceland and more than half of the planting is birch. The rest is a blend of European rowan, tea-leaved willow, woolly willow and alder. We are also experimenting with elm which, although not strictly speaking a domestic species, is closely related to birch and which we believe may have been in Iceland before the Ice Age on the basis of fossil remains we found here. We hope that this programme will improve the 'parr' carrying capacity of the river by increasing the food and nutrients in the river and thereby increasing the numbers of healthy smolt that are able to leave the river.



Use of Ladders

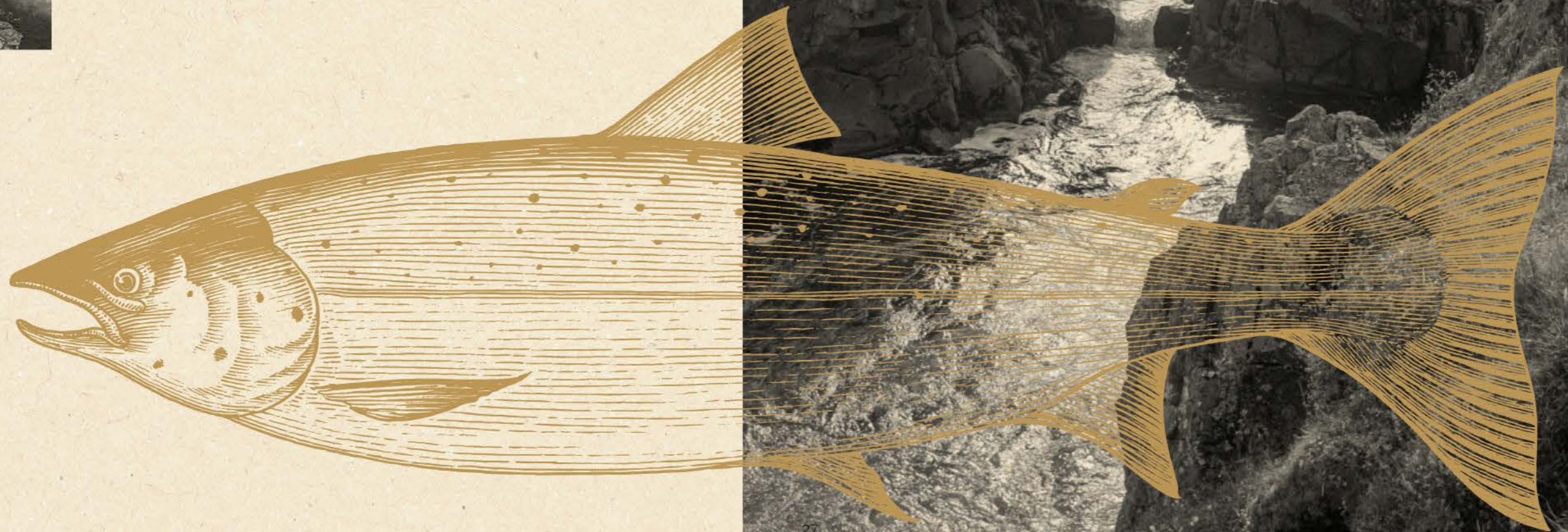
The main purpose of a ladder is to enable salmon to reach parts of a river that were previously inaccessible to them.

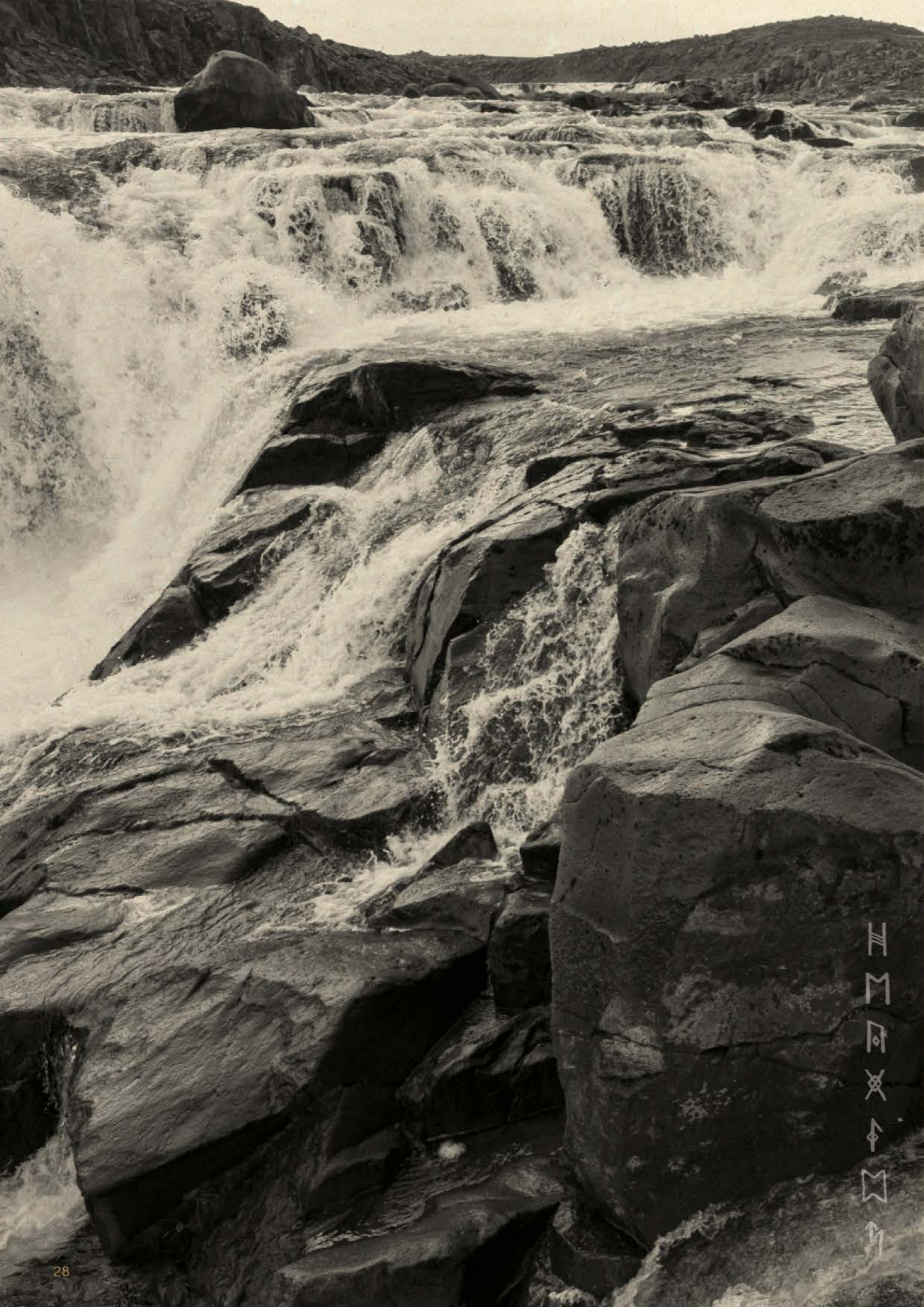
Most often, it is a waterfall that creates the obstruction and the ladder provides a natural passage for the fish past that barrier.

The opening up for the salmon of previously closed parts of their river is beneficial as it increases the breeding length of the river. This is a gradual process and, in the years before a ladder is built, we will physically move salmon above the waterfall to encourage the fish to return instinctively to spawn in that part of the river.

The first ladder on the Selá was built in 1970. The effect was to increase the length of river populated by salmon from 9km to 26km. The average salmon catch over a 20 year period increased from 200 fish per year to 1800 fish per year. It took 20 years for the natural stock to occupy the new river and the annual catch number is still rising. A further ladder was added to the Selá in 2011 and today the salmon can populate 36km of river.

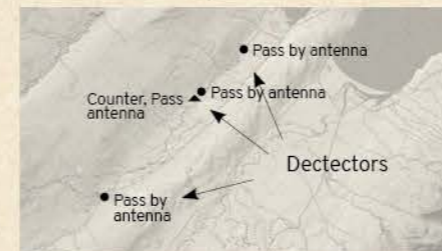
Strengur Angling Club (our heritage) and the Six Rivers Project have been responsible for the construction of a number of fish ladders in North East Iceland and there are plans to build more in the future. Initially concrete was used, but in recent years the Six Rivers Project has improved the process by cutting ladders out of bedrock creating a more natural environment for the salmon.





Tagging

Early tagging results-
Vesturdalsá Smolt Run 2020
We found that most smolts
leave when the water
temperature rises in
mid-June.



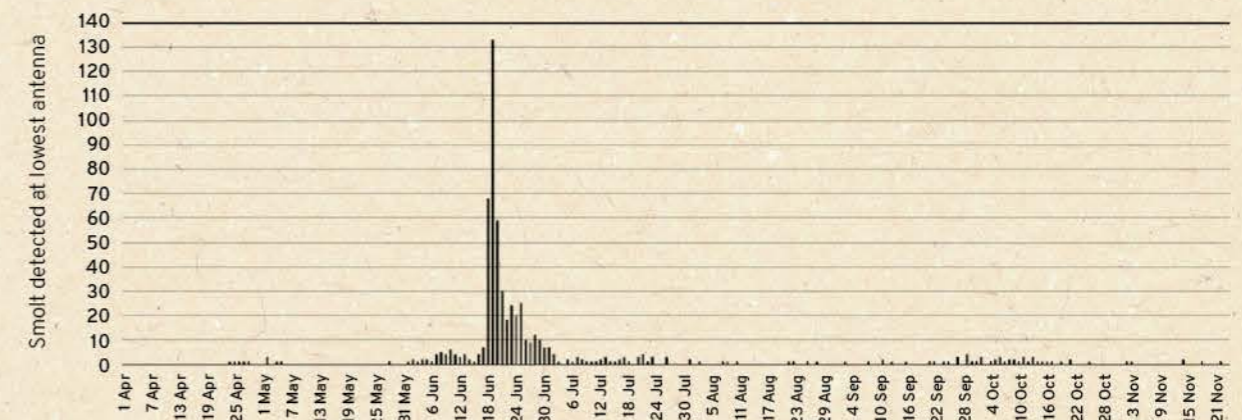
50% of smolts are lost before
leaving the river. The effective
smolt return rate after one
winter at sea is about 2%.

We have tagged parr and smolts (maturing salmon) in a key river – the Vesturdalsá – with very small tags which uniquely identify the fish. We have equipped the Vesturdalsá with antenna up and down the river to enable us to chart their movements and so gather new data on how many parr survive to become smolts, and how many smolts leave the river then survive to return to the next year as adult fish ready to spawn. Alongside this, by starting to measure food sources and the demands of the fish for food, we have set about the task – never before done – of estimating the carrying capacity of the river.

In 2020, we carried our smolt and parr tagging, something we intend to do annually going forward.

A proportion of Parr and Smolts are tagged with PIT tags - unique identifiers for each fish which stay with the fish for its life. Previous work has shown that the tags do not affect the fish.

Tagged fish are detected using antenna at three locations along the Vesturdalsá. River movements, migration and survival rates are measured.



Ongoing Research

We are working next to increase our understanding of the cause of losses through the salmon life cycle, for instance we have so far found that predation – loss of salmon to birds – may be higher than originally thought.

In later stages of the project, we hope to turn our attention to the question of the sea. Where do our East Icelandic salmon go, and how might known changes at sea – for example currents and temperatures – be affecting their abundance?

This research, coupled to re-vegetation, egg planting and opening of salmon ladders will give us unique insights into how best to sustain and grow the populations of salmon.

By working with the international salmon community, for example at our annual conference, we hope to make sure that learnings from the pristine rivers of Iceland are transferred elsewhere and help salmon populations across the region.



Your Contribution- Six Rivers Fishing

The Six Rivers Project manages what we believe to be the best remaining salmon rivers in the world, providing world class salmon fly fishing experiences, and we're very grateful that you've joined us here. It is the revenue generated by your visit that enables us to develop our urgent conservation work and invest in the long-term sustainability of North Atlantic salmon stocks. We currently have ongoing conservation projects at four of our rivers, and hope to add more over time.

We thank you also for adhering to our strict fishing conservation rules, which aim to minimise angling pressure on populations. By limiting the number of rods on each river, and restricting the amount of time guests can fish each day, we create an opportunity for fish to thrive. We hope you will also enjoy the peace and exclusivity of your experience- it is unlikely you will see another fisherman as a typical beat is kilometres, not metres. There are between 10 and 3 rods per river.

All of our rivers feature in the top league for salmon caught per rod per day.

The two rivers with the most provenance are the Sela and the Hofsá. Both are magnificent, and both empty into Vopna Fjord. They are big rivers, with big fish and big personalities.

Much has been written about fishing, but it is clear that a fine day's fishing is not simply about numbers. It is about many things- some felt, some heard. The view, the majesty of the river, the guide, nature around you, the sense of optimism and excitement, the journey to the pool. We believe we score highly on all these criteria in this wild unpopulated corner of Iceland.

...But you do also need to catch fish. And our rivers hold their own with any in the world both in terms of numbers of fish caught per rod, and size. We catch big salmon. (The weather can be another thing!)



The Fish

Live data

You can check live catch data for the rivers at: sixrivers.is/live-data/.

We don't have full data for all rivers but we share with you what we have.

You can therefore judge for yourself how well the rivers are fishing.

Some of us find it interesting to check how many salmon climbed the fish ladder each day (a proxy for salmon entering the river) or how many fish were caught.

Warning:
this can be addictive!

You will find a number of species of fish in the rivers, including Atlantic salmon, Arctic char, and sea trout.

Beginners or children may find it easier to fish for Arctic char, a smaller species, and we can tailor your outings to make them more suitable for you and your family needs.

You will also encounter a wealth of other wildlife on your trip – from birds to land animals, marine mammals and unique flora. Please see our website www.sixrivers.is/nature and speak to your guide to find out more.



A Brief History of the Six Rivers Project

The Strengur Angling Club was founded in Reykjavik on 29th October 1959.



Jim Parise

CEO Sir Jim Ratcliffe
Six Rivers Conservation
Project

In 1962, a group of members visited East Iceland to review suitable options for the club. It was clear that the Selá river was a highly desirable fishing ground given its prolific salmon population and crystal clear water. In 1969 the club acquired the Hvammsgardi farm in Vopnafjörður, turning the main farmhouse into a fishing lodge.

As the years passed, Strengur purchased more farms in Vopnafjörður and the clubs operations have grown in this region of Iceland, including the acquisition of the beautiful Hofsá river in 2009.

In 2017, an agreement was reached for Sir Jim Ratcliffe to purchase the majority of shares in Strengur. He established the Six Rivers Project in order to strengthen the fundamental values established at the time of Strengur's founding, namely to continue to safeguard the salmon stocks on the rivers by a combination of conservation and responsible fishing policies. We look forward to a bright future of sustainable fishing and expert conservation.



Design by MTM Agency

SIX RIVERS PROJECT

Notes

WWW.SIXRIVERS.IS/