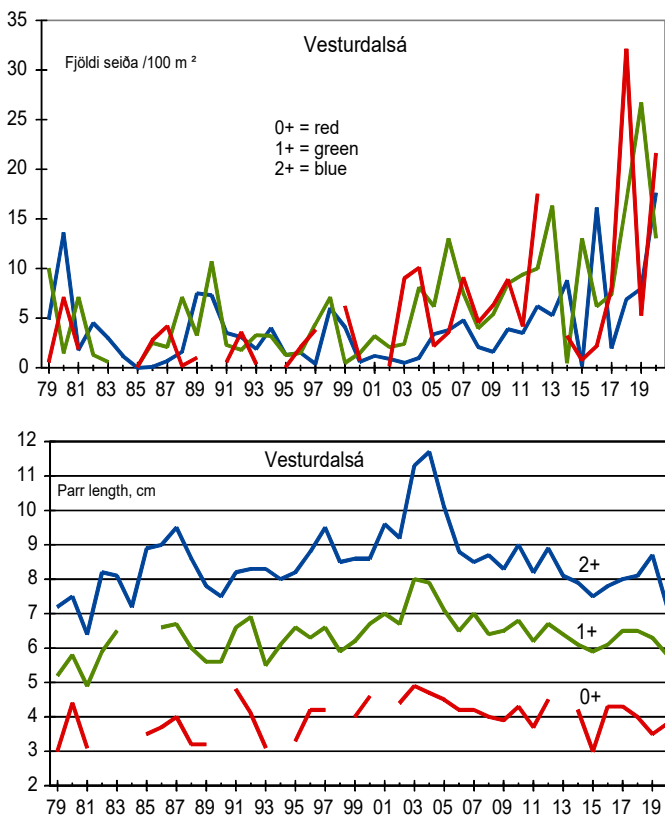


Spawning stock size and parr growth in Icelandic salmon rivers

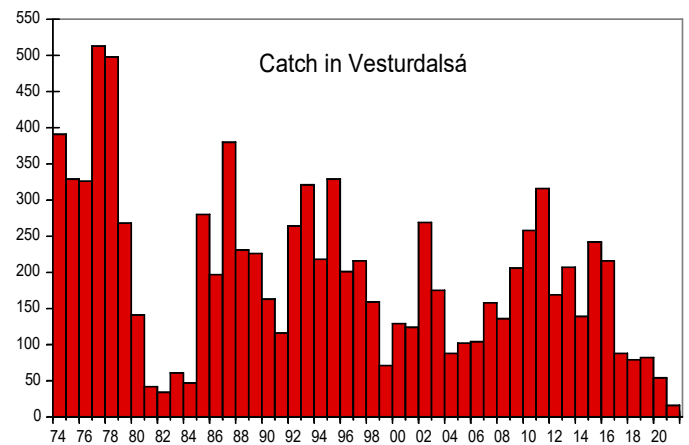
The only thing that can be accurately measured in studies of salmon fry is the growth, length / weight, at the observation period. Such studies are usually carried out in the second part of the summer, usually at a similar time in each river and therefore comparable between years. The growth shows the thrive of the fry and the food supply per individual. Poor growth means little food or too much fry, something that leads to drop-offs and production losses. Density measurements are very imprecise, especially in the youngest and oldest cohorts. It can be considered that mass counts of one-year-old juveniles are the most "accurate".

I have compiled figures on the growth and density of salmon fry in several rivers where this has been monitored for a long time. The common thing is that growth is similar in most rivers, 0+ around or under 4 cm, 1+ mostly under 7 cm and 2+ 8-9 cm, regardless of whether it is in the West, North or East Iceland. In many rivers, growth has slowed down in recent years. In many rivers, there has been an increase in the number of juveniles in last 25 years, probably due to milder winters, but juveniles also emerge from the gravel earlier now than in the 1990s, according to author's experience. After reviewing these data, it can be concluded that the density of juveniles in these rivers is so high that it inhibits growth. Releasing salmon to increase the n. of juveniles does not lead to salmon runs becoming larger, and therefore useless or harmful. An Englishman, Jim Ratchliff, has bought 6 salmon rivers in NE Iceland, in order to manage them and by that, save the Atlantic salmon from extinction as he says. The main theme in the program is to reduce catches by catch release and plant trees in the watershed to in order to increase the productivity of the rivers.

In my opinion, Ratchliff's actions on NA Iceland land will not "save" salmon stocks in the N-Atlantic. It should be noted that in the period 1974-2012, the catch in Vesturdalsá was often 300-500 fish, but in the summer of 2022, about 200 salmon passed through the fish counter. Only 16 were caught and all of them were released. This is the Britons home river.



Vesturdalsá in Vopnafjörður



Salmon fishing in Vesturdalsá in Vopnafjörður 1974-2021. The depression, which begins in 1979, is due to the coldest spring that has come in recent times, but the cold caused a large decline in growth both in the river and in the sea. In 2022, much fewer salmon entered the river, according to fish counters, than were generally caught before 2012.

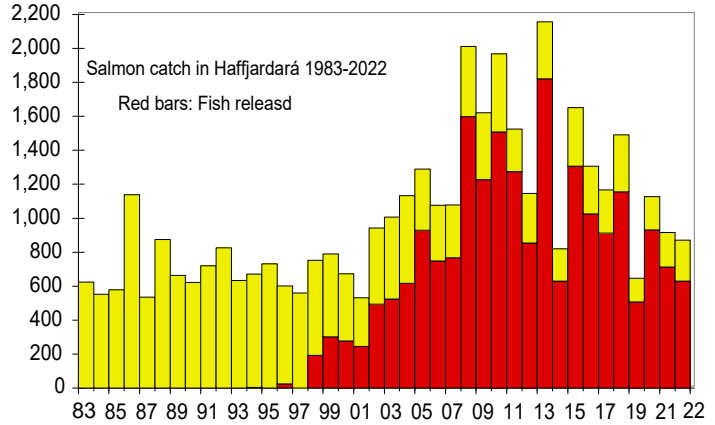
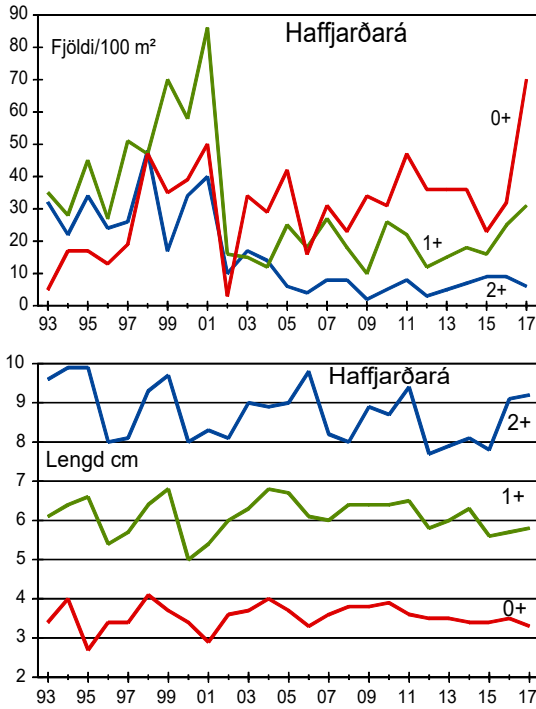
In the upper picture you can see the measured fry density in Vesturdalsá. Before the turn of the century, you can see a drop in the number of juveniles in the first year (0+), some years they are not found, they probably come out of the gravel late. From the turn of the century, the number of juveniles increases significantly, presumably due to longer summers. The years 2003 and 2004 were very warm in NA and the growth of juveniles in most rivers in the region was unusually good.

The lower picture shows the growth of the juvenile cohorts, their length in autumn. It can be seen that the first-year juveniles are often larger than 4 cm, and this equals the length of similarly old juveniles in the west, where it usually warms up earlier in the spring.

West Iceland

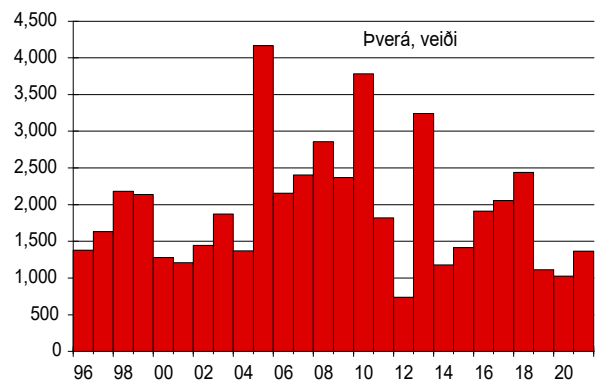
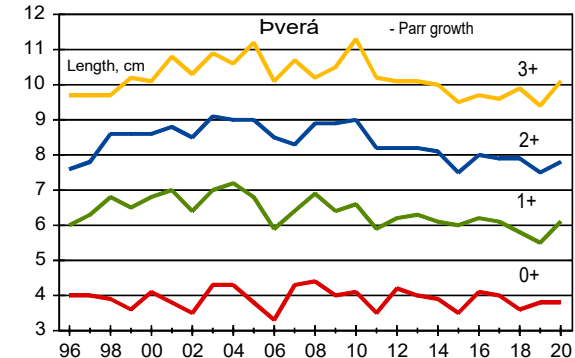
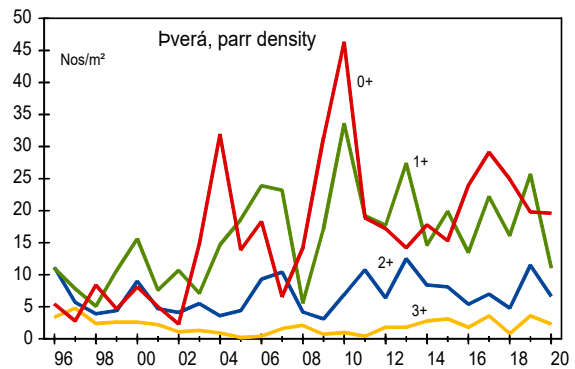
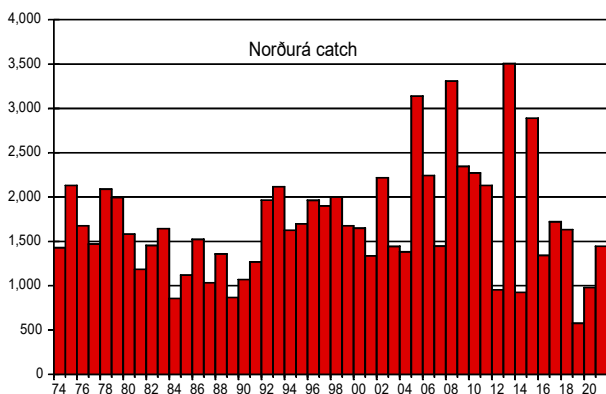
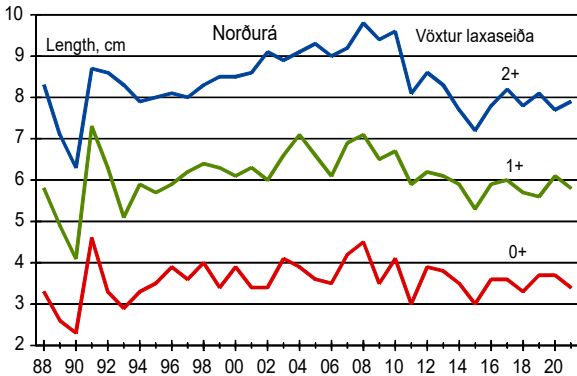
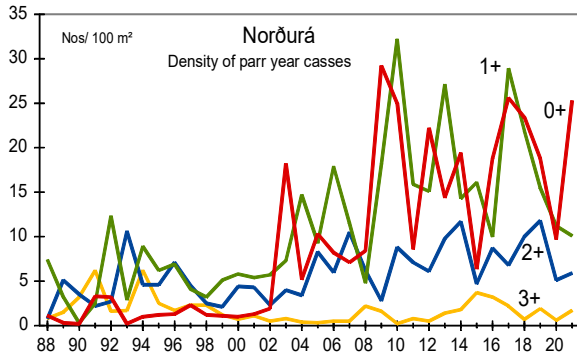
Density and growth of juveniles in Haffjarðará

For a long time about 700 salmon were caught in the Haffjarðará. Release of caught salmon (red) started just before the turn of the century, at first on a small scale, but it increased rapidly and since 2005 releases are about 80%. All large salmon, II winter fish, have been released all the time.



Norðurá and Þverá

Below, fishing in Norðurá and Þverá is shown, as well as the density and length of juveniles in the different years. Clearly the growth of all cohorts has decreased from 2008-2010, but then it can be assumed that increased releases of caught fish, the expansion of the spawning stock, is occurring. The spawning stock becomes too large. - **Increased releases reduce the river's parr production.**

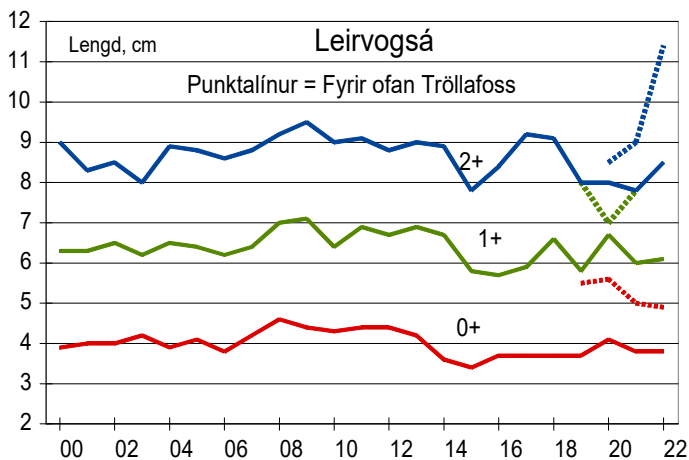
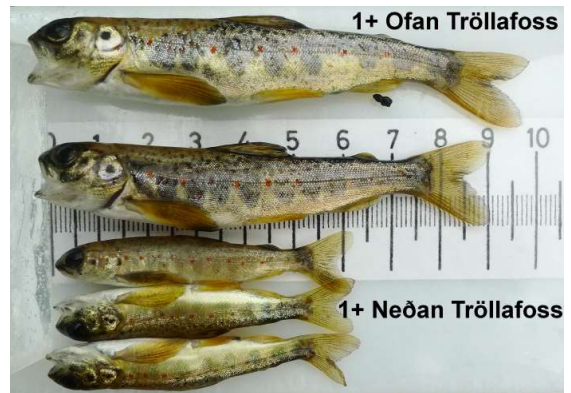


Growth of juveniles in Leirvogsá.

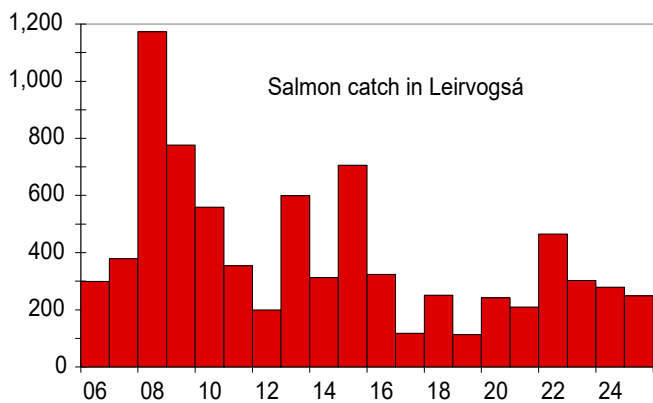
Tröllafoss is unpassable for salmon, but spawning salmon have been released there in 3 km stretch of river at a density of 2-3 females/km. Below the waterfall, the density is much higher, 15-20 females/km. Growth above Tröllafoss is much better and the density is high. The project continues and growth, spread and density will be better monitored. In the fall of 2022, 11 females and 14 males were released into the area. No fishing is allowed there. Fishing regulations have been expanded, from fly only and releasing everything to allowing worms and abolishing the obligation to release.

Photo of juveniles of the same age above and below the unpassive Tröllafoss in 2019 and 2022. The upper juveniles are from the area **above the waterfall**, where the n. of spawning females are controlled, while the lower ones are from the **area below Tröllafoss**.

The weight difference is multiple.



Growth of cohorts of salmon parr in Leirvogsá. **Solid lines** show fry growth below Tröllafoss, while **dotted lines** show fry growth above Tröllafoss



It is obvious that catch/ release in salmon rivers increases the spawning stock.

Therefore, competition and mortality increases and the smolt production of the river decreases.