Status of wild Atlantic salmon in Norway 2025

Photo: Eva B. Thorstad

Norwegian Scientific Advisory Committee for Atlantic Salmon

The status of Norwegian wild Atlantic salmon is evaluated annually by the Norwegian Scientific Advisory Committee for Atlantic Salmon. This is an English summary of the 2025 report.

The committee is appointed by the Norwegian Environment Agency to evaluate status of salmon and importance of different threats, and to give science-based catch advice and advice on other issues related to wild salmon management.

Fourteen scientists from seven institutions serve on the committee: Torbjørn Forseth (leader), Geir H. Bolstad, Sigurd Einum, Morten Falkegård, Peder Fiske, Anders Foldvik, Åse Helen Garseth, Øyvind Kaste, Helge Skoglund, Monica F. Solberg, Eva B. Thorstad, Kjell Rong Utne, Knut Wiik Vollset and Asbjørn Vøllestad. The committee is an independent body, and the members do not represent the institutions where they are employed when serving on the committee.

Contact: Torbjørn Forseth (torbjorn.forseth@nina.no), Eva B. Thorstad (eva.thorstad@nina.no), Peder Fiske (peder.fiske@nina.no), or any other member of the committe. www.vitenskapsradet.no

Status of Atlantic salmon - short summary

The decline of the salmon continues. Norwegian salmon populations are at a historically low level, and the number of salmon returning from the sea to Norway in 2024 hit an all-time low. In fact, three of the past four years have seen very low returns.

Declining salmon populations have led to the closure of salmon fishing in many rivers and much of the sea in recent years. In 2024, the harvestable surplus - salmon that can be caught sustainably - dropped to a record low. Several rivers were closed to fishing during the 2024 fishing season, while strict limits were imposed on fishing in other rivers and remaining sea fisheries.

The cause of the reduced salmon populations is human activities and low survival at sea. The biggest human induced threats are salmon farming and climate change. Salmon lice pose the greatest threat, and there is a risk of worsening conditions due to insufficient measures. Salmon populations in Western and Central Norway are the most diminished, and the impact of fish farming significantly contributes to the low returns and the fact that nearly half of the rivers no longer have any surplus salmon left to fish.

The salmon in the Tana River system is critically endangered. The main cause is previous overexploitation. In 2024, the return was more than halved compared to the already very low levels seen in 2020 to 2023, and there is a risk of further decline in the coming years.

The 2025 annual report is published in Norwegian: https://brage.nina.no/nina-xmlui/handle/11250/3197886

Vestre Jakobselv. Photo: Eva B. Thorstad

Extended summary

• The decline of salmon continues – Norwegian wild salmon is at a historic low

For salmon and salmon fishing, 2024 was a historically poor year, with the lowest number of salmon, the lowest harvestable surplus, and the lowest salmon catches ever recorded. More than a third of the populations had no surplus salmon available for harvest. It was especially the return of large-sized salmon (i.e., salmon over 3 kg) that failed in 2024, but the return of small salmon was also low.

Salmon populations have been at a low level for many years, and over the past four years, there has been a further decline. The reduction in salmon populations is caused by human-induced threats and decreased marine survival.

• The salmon return, which is the number of salmon returning from the ocean to spawn in Norway, was the lowest ever recorded in 2024

The salmon return in 2024 was estimated at around 323,000 wild salmon, including those caught during fishing (**Figure 1**). Three of the four lowest salmon returns have occurred in the past four years. The return is now only one-third of what it was in the early 1980s (**Figure 1**).

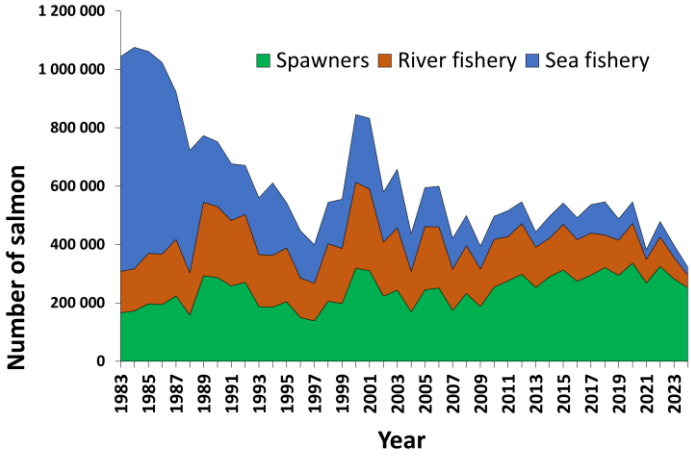

Figure 1. *Estimated number of salmon returning annually from the ocean to the coast of Norway, and how the return is distributed between number of fish caught in the sea fisheries, caught in the rivers during angling, and left for spawning in the rivers during the period 1983-2024.*

• The catch of salmon in rivers and sea fisheries in 2024 was the lowest ever recorded (data series since 1980)

A total of 50,500 salmon were reported caught in the rivers and sea in 2024 (**Figure 1**), with a total weight of 168 tonnes. In addition, 15,000 salmon (55 tonnes) were caught and released during angling in the rivers. Of all the salmon caught in rivers, 33% were released. This is the highest proportion of caught and released salmon ever recorded.

Catches in 2024 were low due to the reduced return of salmon larger than 3 kg body weight, which led to even stricter fishing restrictions than previous years. Due to the poor salmon return, 32 rivers were closed for fishing from June 23. Of these, 16 rivers remained closed for the rest of the season, and 16 were closed until July 11, but reopened with stricter fishing regulations. Many

other rivers also had stricter fishing regulations during much of the 2024 season compared to previous years, and sea fisheries were also further restricted.

The restrictions introduced during the fishing season resulted in reduced harvesting in line with the decline in salmon populations. These measures prevented increased overexploitation.

• The largest decline in salmon populations has occurred in Central Norway and Western Norway, as well as in the Tana River system – In Western and Central Norway, the impact from salmon aquaculture has significantly contributed to the decline

The long-term trend in salmon populations from the late 1980s until today varies across different parts of the country. In contrast to the development in other regions, the salmon run into Western and Central Norway has decreased significantly since 1989. In both Western Norway and parts of Central Norway, it is highly likely that the impact from aquaculture substantially contributes to the low run and thus a low and reduced harvestable surplus.

Most of the populations that had no harvestable surplus in 2024 are located in Western and Central Norway. In Western Norway, nearly half (44%) of the populations had no harvestable surplus of salmon, and in Central Norway more than half (52%) of the populations had none.

The salmon run into Southern Norway has generally not changed much since the late 1980s, although there have been variations between years. Salmon populations have increased due to extensive liming measures, improved water quality, and re-establishment of salmon populations in watercourses affected by acid rain.

The salmon run into Northern Norway, excluding the Tana River system, has been relatively stable since 1989, but the run and the harvestable surplus have been reduced in recent years, likely due to poorer sea survival also in the northern marine areas.

• The salmon in the Tana River system is critically endangered

The reason is a critical reduction in the population and the risk of further reduced runs in the coming years. The salmon run has been drastically reduced since 2002 and the number of spawners is far below the conservation limit. The Tana River system has had a markedly reduced salmon run compared to the rest of Northern Norway. Particularly concerning is the critically low run in 2024. Many of the subpopulations in the river system have been heavily overfished for many years, and fishing in the Tana River and adjacent sea areas was therefore closed from 2021. When populations have reached levels as low as they are now, low marine survival, possibly combined with increased predation pressure, means that rebuilding the populations in the Tana River system is very challenging.

• The harvestable surplus is strongly reduced, and salmon fishing in the sea and rivers has been significantly restricted

Overall, an estimated 22% of the salmon returning from the ocean towards Norwegian rivers were caught either at sea or in rivers in 2024. Most salmon are caught in rivers. In 2024, 13.4% of the salmon returning from the ocean were caught in rivers, and 8.6% were caught in sea fisheries.

There has been a strong reduction in salmon fishing. In the 1980s, more than 80% of the salmon was estimated to have been caught by fishing. Drift net fishing at sea was banned in 1989, and since then both sea salmon fishing and recreational fishing in rivers have been restricted several times. Never before has such a low proportion of returning salmon been caught as in 2024.

The status of salmon populations varies greatly between regions and rivers. Harvest regulations depend on the state of the populations, so the fishing pressure also varies between regions and rivers. Many watercourses have very low harvest rates or have been closed for fishing due to low salmon numbers.

Fishing has been reduced more than the decline in salmon populations, and the result is that the number of salmon spawning in rivers has increased over the past 10-15 years, but with a decline in the last two years (**Figure 1**). The reduced fishing has thus compensated for the decline in salmon populations.

• Fewer populations reached conservation limits in 2024 than in previous years – the reason was a lack of, or very low, harvestable surplus in many populations, not excessive fishing pressure

The proportion of populations that reached their conservation limit was reduced compared to previous years, to 57% in 2024. The management goal for a population is that the average probability that the conservation limit was reached in the last four years is at least 75%. The management goals for the period 2021-2024 were reached or nearly reached for 88% of the populations (**Figure 2**), considering uncertainties in targets and assessments of achievement. There has been a long-term improvement in achieving management goals since 2009, with a marked increase in the number and proportion of populations where the goal was reached. The long-term improvement is due to stricter fishing regulations and thus reduced harvest pressure. However, due to poorer achievement of conservation limits in 2024, there was a reduction in the proportion of populations that reached their management goals for 2021-2024 compared to the previous period.

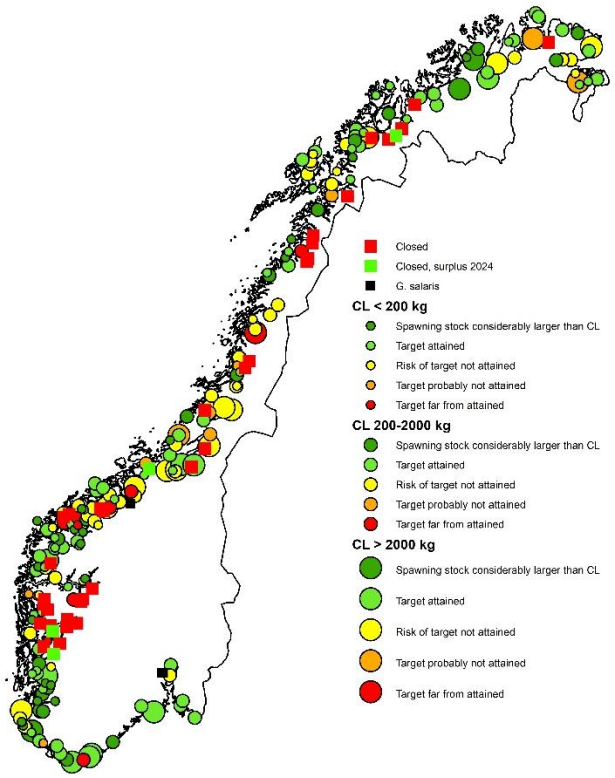

Figure 2. *Assessment of the achievement of management goals for individual watercourses for the period 2021–2024. The management goal was reached in all populations marked with green circle symbols. The size of the symbols reflects the size of the conservation limit in each watercourse. Watercourses closed for fishing or where no assessment was made because the population is infected with G. salaris are also shown. For closed watercourses, it is indicated whether there was likely a harvestable surplus in 2024 or not. CL = conservation limit.*

• Many populations have poor or very poor status

Population status is considered good only when the conservation limit is reached, and there is a normal harvestable surplus that can be fished. When a population does not have a normal harvestable surplus, it indicates that local or regional factors have negatively affected it. A population that reaches the conservation limit but where harvesting has ceased because fishing has not been allowed, or is very small due to strict fishing restrictions, does not have good status.

In 2024, 40% of the salmon populations had very poor status. Particularly Western Norway and Central Norway have many populations with poor or very poor status, and in 2024 there was a further deterioration compared to previous years. In Northern Norway, the status of salmon populations is better than in Western and Central Norway, but the proportion of populations in poor or very poor condition has increased since 2018. Southern Norway has the largest proportion of populations in good or very good condition.

• The greatest human-caused threats to Norwegian salmon are linked to the effects of salmon farming and climate change

There was no improvement in any of the human-caused threats to salmon in this year's assessment. Salmon lice from fish farms are the biggest human-caused threat to Norwegian salmon, along with escaped farmed salmon and infections related to aquaculture (**Figures 3 and 4**). The number of salmon populations assessed as critically endangered due to salmon lice has increased in recent years. The amount of escaped farmed salmon observed in Norwegian watercourses has decreased over time, but genetic changes due to interbreeding with escaped farmed salmon have been detected or indicated in a large number of salmon populations. The number of reported escapes was higher in 2024 than in the previous four years, and watercourses with a high proportion of escaped farmed salmon show that there is still a need for measures to reduce escapes.

Infections related to fish farming are also a significant threat to Norwegian salmon populations. However, knowledge about their effects is limited, and there is great uncertainty about future developments. More knowledge about such infections is needed. Lack of knowledge may lead to this threat being underestimated.

• The threat from climate change has increased

Climate change is assessed as having a greater impact on salmon populations than in previous assessments. Climate change affects all marine areas used by salmon. Rivers throughout the country are impacted by, for example, high summer temperatures and drought, floods occurring at unusual times of the year, loss of spring floods, loss of stable ice cover in many rivers that normally had ice cover, and increased ice drift during winter. The threat assessment covers a period of two to three salmon generations into the future, and climate change may pose an even greater threat to salmon populations in the longer term than assessed here.

Reducing greenhouse gas emissions is a necessary measure and a global challenge. For salmon management, climate change increases the importance of having large and genetically diverse salmon populations capable of coping with rapid changes. Climate change therefore increases the need for measures against other threats.

• Other major threats to salmon are habitat alterations in rivers and hydropower regulation. Negative effects can be mitigated by measures on a much larger scale than currently implemented

Many more measures can be taken to reduce the effects of hydropower regulation and other habitat alterations. Methods for reducing negative effects are well developed and available.

• Pink salmon have shown a marked increase in number and distribution, but knowledge about their effects and the measures taken is insufficient

Pink salmon is an introduced alien species and a threat that has developed significantly in recent years due to a marked increase in number and distribution. Knowledge about the effects on salmon, sea trout, and Arctic char is insufficient. Therefore, uncertainty about future developments is large.

• The parasite *Gyrodactylus salaris* and acid rain are threats that currently have limited impact on salmon due to effective measures

The introduced parasite *G. salaris* has been one of the major threats to salmon, but successful eradication efforts and conservation of salmon populations have allowed populations to rebuild in previously infected watercourses. Measures have further limited the risk of spreading to new watercourses. All infected regions except the Driva and Drammen regions are now declared free of *G. salaris*. The five infected watercourses in the Driva region have been treated and will be under monitoring in the recovery program from 2025.

Acid rain has also been a major threat to salmon, but due to extensive liming measures and reduced emissions, there is little risk of further future damage. Negative impacts from acid rain on populations are therefore assessed as lower than before.

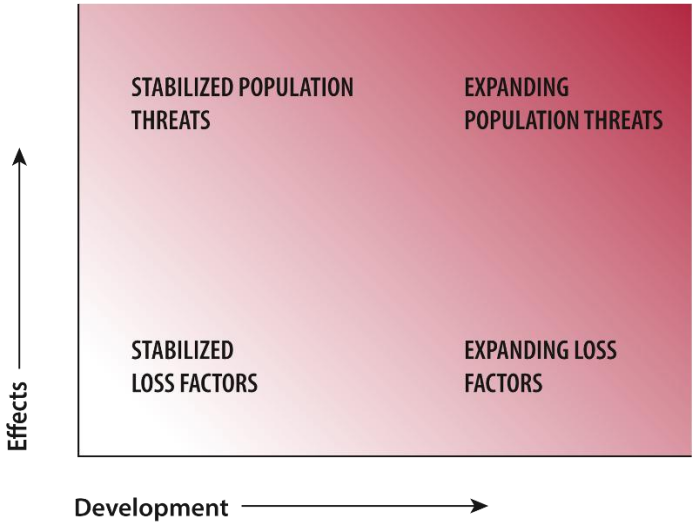

Figure 3. *The classification system developed to rank different anthropogenic impacts to Atlantic salmon populations along the effect and development axes. The four major impact categories are indicated, but the system is continuous. Dark background colour indicates the most severe impacts. The effect axis describes the effect of each impact factor on the populations, and ranges from factors that cause loss in adult returns, to factors that cause such a high loss that they threaten population viability and genetic integrity. The development axis describes the likelihood for further reductions in population size or loss of additional populations in the future.*

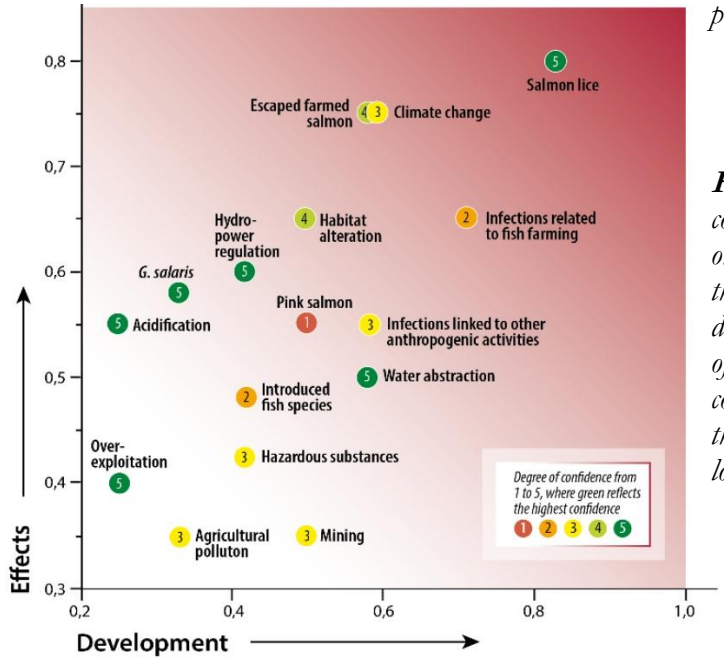

Figure 4. *Ranking of 16 impact factors considered in 2025, according to their effects on wild Atlantic salmon in Norway, and the likelihood of a further negative development. Confidence for the assessment of effect by each threat is indicated by the color of the markers, where green indicates the highest confidence level and red the lowest.*

• **For sea trout, salmon lice from fish farms is by far the greatest human-caused threat**

Salmon lice from fish farms is the largest human-caused threat to sea trout and is assessed as an unstable population threat (**Figure 5**). Many populations across large parts of the country are severely affected by salmon lice, and the impact of salmon lice on sea trout was likely greater in 2024 than before. The risk that populations will become critically endangered or lost due to salmon lice is high because of insufficient measures. Climate change is the second largest threat to sea trout. The threat picture for sea trout in 2025 is similar to the previous two years; no changes have been made in the threat assessment for any of the human activities evaluated.

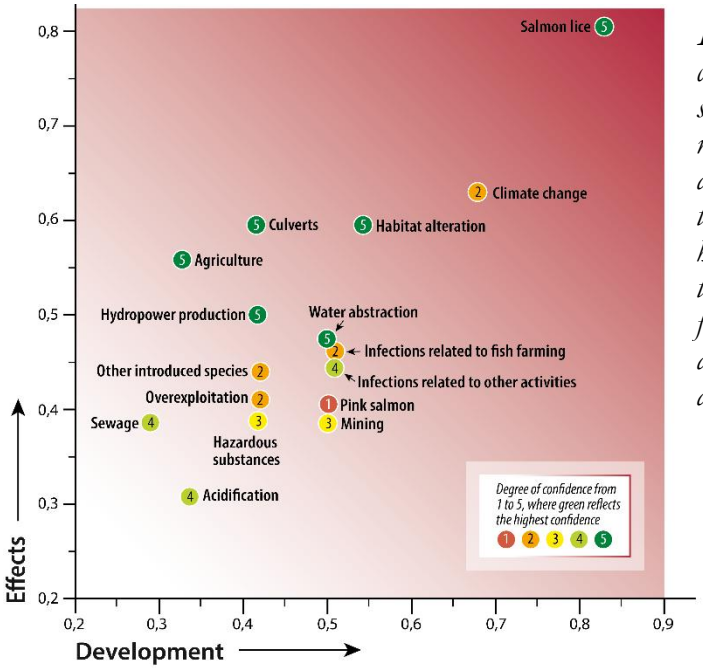

Figure 5. *Ranking of 16 impact factors considered in 2025, according to their effects on sea trout stocks, and the likelihood of a further negative development. Confidence for the assessment of effect by each threat is indicated by the color of the markers, where green indicates the highest confidence level and red the lowest. Note that water abstraction, infections related to fish farming and other infections have the same assessment for development (0.5), but the symbols are spread out for graphical visibility.*

Scientific publications from the Norwegian Scientific Advisory Committee for Atlantic Salmon

Falkegård, M., Lennox, R.J., Thorstad, E., Einum, S., Fiske, P., Garmo, Ø., Garseth, Å., Skoglund, H., Solberg, M., Utne, K.R., Vollset, K.W., Vøllestad, L.A., Wennevik, V. & Forseth, T. 2023. Predation of Atlantic salmon across ontogenetic stages and impacts on populations. Canadian Journal of Fisheries and Aquatic Sciences doi: 10.1139/cjfas-2023-0029.

Fiske, P., Forseth, T., Thorstad, E.B., Bakkestuen, V., Einum, S., Falkegård, M., Garmo, Ø.A., Garseth, Å.H., Skoglund, H., Solberg, M., Utne, K.R., Vollset, K.W., Vøllestad, A. & Wennevik, V. 2024. Novel large-scale mapping highlights poor state of sea trout populations. Aquatic Conservation: Marine and Freshwater Ecosystems 34: e4067.

Forseth, T., Fiske, P., Gjøsæter, H. & Hindar, K. 2013. Reference point based management of Norwegian Atlantic salmon populations. Environmental Conservation 40: 356-366.

Forseth, T., Barlaup, B.T., Finstad, B., Fiske, P., Gjøsæter, H., Falkegård, M., Hindar, A., Mo, T.A., Rikardsen, A.H., Thorstad, E.B., Vøllestad, A. & Wennevik, V. 2017. The major threats to Atlantic salmon in Norway. ICES Journal of Marine Science 74: 1496-1513.