IP(19)18rev4

NASCO Implementation Plan for the period 2019-2024

Norway
(Revised November 2022)

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The main purpose of this Implementation Plan is to demonstrate what actions are being taken by the Parties / jurisdictions to implement NASCO's Resolutions, Agreements and Guidelines.

In completing this Implementation Plan please refer to the ***Guidelines for the Preparation and Evaluation of NASCO Implementation Plans and for Reporting on Progress****, CNL(18)49.*

Questions in the Implementation Plan are drawn from the following documents:

- *NASCO Guidelines for Management of Salmon Fisheries, CNL(09)43 (referred to as the 'Fisheries Guidelines');*
- *Report of the Working Group on Stock Classification, CNL(16)11;*
- *Minimum Standard for Catch Statistics, CNL(93)51 (referred to as the 'Minimum Standard');*
- *Revised matrix for the application of the six tenets for effective management of an Atlantic salmon fishery, WGCST(16)16*[1]*;*
- *NASCO Plan of Action for the Application of the Precautionary Approach to the Protection and Restoration of Atlantic Salmon Habitat, CNL(01)51;*
- *NASCO Guidelines for Protection, Restoration and Enhancement of Atlantic Salmon Habitat, CNL(10)51 (referred to as the 'Habitat Guidelines');*
- *Williamsburg Resolution, CNL(06)48;*
- *Guidance on Best Management Practices to address impacts of sea lice and escaped farmed salmon on wild salmon stocks (SLG(09)5) (referred to as the 'BMP Guidance');*
- *Guidelines for Incorporating Social and Economic Factors in Decisions under the Precautionary Approach (CNL(04)57); and*
- *Road Map' to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of G. salaris and eradicate it if introduced', NEA(18)08.*

Party:	**Norway**
Jurisdiction / Region:	**N/A**

[1] This document can be obtained from the NASCO Secretariat; email hq@nasco.int

1. Introduction

1.1 What are the objectives for the management of wild salmon? *(Max 200 words)*

According to the Norwegian legislation and environmental policy, the objective for the management of wild salmon is to conserve and restore spawning stocks at levels of abundance and with a composition that ensures genetic diversity and the full utilisation of the natural productive capacity of salmon habitat. Habitat shall be managed to preserve diversity of nature and its productive capacity, and threats and adverse impacts shall be identified and eliminated. Wherever this is not possible, adverse impacts on the production, abundance and composition of salmon stocks shall be counteracted or neutralized. Impacts threatening the genetic diversity of salmon shall be reduced to not-harmful levels. Where enough information is available, salmon populations are classified according to the National Quality Norm for Wild Salmon. For a population to attain a good enough standard according to the norm, the population must not be genetically impacted by escaped farmed salmon or other anthropogenic activities, it must reach the spawning target and it must provide a normal harvestable surplus.

Precautionary Approach shall be applied as a basic principle for all sectors involved.
Within this framework, the salmon resource shall be managed to the greatest possible benefits to society, fishing right holders, and recreational fishermen.

1.2 What reference points (e.g. conservation limits, management targets or other measures of abundance) are used to assess the status of stocks? *(Max 200 words)* *(Reference: Sections 2.4 and 2.5 of the Fisheries Guidelines)*

Spawning targets have been established for 439 out of the approx. 465 Norwegian salmon rivers, which are considered to sustain one or more local stocks.

The management target is defined as reached when the average probability for reaching the spawning target the four previous years is higher than 75%.

The Norwegian Scientific Advisory Committee for Atlantic Salmon Management (SACAS) assesses annually whether these targets have been reached for about 195 river stocks, mainly based on catch statistics, fish counters, exploitation rates and number of spawners. Approx. 90% of total river catch of salmon in Norway originates from these rivers.
Stock assessments for individual rivers can be found in the Norwegian Salmon Database.

Statistical uncertainties in spawning targets and target attainment are dealt with by the metods in use.

The National Quality Norm for Wild Salmon sets limit values for the quality of wild salmon stocks based on the population's reproduction, harvest potential and genetic integrity, and is used as a tool in the management of salmon stocks.

1.3 What is the current status of stocks under the new classification system outlined in CNL(16)11?

Stock Classification Score	Salmon Classification Category	No. rivers
0	Not at Risk	18
1	Low Risk	94
2	Moderate Risk	128
3	High Risk	192
N/A	Artificially Sustained	17
N/A	Lost	12
N/A	Unknown	17

Additional comments: add 13 classified as "uncertain"

1.4 How is stock diversity (e.g. genetics, age composition, run-timing, etc.) taken into account in the management of salmon stocks? *(Max 200 words)*

In Norway there is generally only one yearly salmon run. A survey has defined several categories of stocks based on duration of stay at sea and body size: “Typical grilse stocks”, “grilse stocks with large grilse”, “2SW stocks”, and MSW stocks”. Norway also has two stocks of landlocked salmon. The stock diversity is considered by reducing selective effects of fisheries, and more strict regulations are implemented for threatened, vulnerable or reduced stocks that enter into the system with national salmon rivers. Where stocking reduces the effective population size due to few broodfish and therefore low genetic diversity, the estimated attainment of spawning targets are downgraded one class.

Escaped farmed salmon poses a threat to the genetic diversity. This is met by measurements to reduce escapements and by targeted fisheries on escaped fish in sea and rivers. To insure genetic diversity where stocks are at high risk of genetic interogression from escaped farmed salmon, a new Gene Bank is beeing built.

175 Atlantic salmon populations are assessed and classified based on measured genetic introgression of escaped farmed salmon. The genetical analysis include samples from both juvenile and adult salmon. This classification is used in the prioritation of which rivers the effort of removing escaped farmed salmon is put in.

1.5 To provide a baseline for future comparison, what is the current and potential quantity of salmon habitat? *(Max 200 words)*
(Reference: Section 3.1 of the Habitat Guidelines)

The process of setting new rules of operation of hydropower plants is ongoing. Several large rivers with Atlantic salmon, including the 52 rivers covered by the "National Salmon rivers" regulatory scheme, will be given special attention in the years to come. This process can lead to improvement of salmon habitat in rivers.

No record of original salmon habitat is available. Spawning targets have been calculated for 439 out of the approx. 465 Norwegian salmon rivers. The total river length of these rivers is approximately 9 600 km, and total river area currently available for salmon production is estimated to 262 000 000 m2. In addition to these river habitats, there are numerous lakes in low-gradient watercourses with potential juvenile salmon habitat. Constructions of fish passages have increased available habitat for salmon by 2 500 km, which represents approximately 26 % of the overall salmon freshwater habitat. Someof the fish passages are not fully in function . Restoration of inefficient fish passages can potentially increase the current salmon habitat by 5-10 %. After liming acidified rivers in Southern Norway have become suitable for salmon production and recolonized by salmon, and now contributes to approx. 15 % of total annual salmon production.

1.6 What is the current extent of freshwater and marine salmonid aquaculture?

Number of marine farms	From “Key numbers of Norwegian aquaculture, 2020”: 1087 commercial licences 118 R&D licences 45 stock-fish licences 986 locations. As several licences may be used on the same geographical location, the number of marine farms in use may vary from time to time but is normally around 600-650 farms.
Marine production (tonnes)	Approx. 1.4 mill tonnes

Number of freshwater facilities	Freshwater: salmon, trout, charr and rainbow-trout: 81 licences Freshwater smolt production: (Rainbow/salmon): 168 licences
Freshwater production (tonnes)	It is difficult to calculate the volume in freshwater aquaculture, as various licences are situated in locations with variable maximum allowed biomass. Furthermore, much of the statistic reports in individuals, rather than weight, and total biomass is not easily read from the statistics. Smolt production: In 2020 the sale of smolt of Atlantic salmon smolt was 388 469 000 individuals, and for rainbow trout 24 212 000 individuals.

Append one or more maps showing the location of aquaculture facilities and aquaculture free zones in rivers and the sea.

Such map can be found at https://www.barentswatch.no/en/fishhealth/ and Akvakultur (fiskeridir.no)

1.7 Please describe the process used to consult NGOs and other stakeholders and industries in the development of this Implementation Plan. *(Max 200 words)*

In the final stages of preparing the Implementation plan, the NGOs were invited to contribute with inputs to the plan draft. Recieved suggestions and comments were forwarded to relevant ministies for consideration.

2. Management of Salmon Fisheries:

In this section please review the management approach to each of the fisheries in your jurisdiction (i.e. commercial, recreational and other fisheries) in line with the relevant NASCO Resolutions, Agreements and Guidelines. For Parties / jurisdictions that prosecute mixed-stock fisheries, there should at least one action related to their management.

2.1 What are the objectives for the management of the fisheries for wild salmon? *(Max. 200 words)*

The objective for the management of the salmon fisheries is to ensure that the natural stocks maintain natural diversity and productivity. The management shall provide a basis for the improvement of stocks with a view to raising yields for the benefit of holders of fishing rights and recreational fishermen.

Fisheries shall be based on stocks that are at full reproductive capacity, and the fisheries on other stocks should be reduced as much as possible. Management targets should be met consistently. Strict regulations should be implemented particularly in fisheries which include threatened, vulnerable or reduced stocks from National Salmon Rivers.

2.2 What is the decision-making process for the management of salmon fisheries, including predetermined decisions taken under different stock conditions (e.g. the stock levels at which regulations are triggered)? *(Max. 200 words)*
(This can be answered by providing a flow diagram if this is available.)
(Reference: Sections 2.1 and 2.7 of the Fisheries Guidelines)

The Norwegian Environment Agency (NEA) is responsible for regulating all salmon fishing in Norway. SACAS gives scientific advice. Given guidelines and input from local and regional stakeholders, the county governors develop proposals for regulations of the fisheries. Where regional councils have been established, the regulations suggested will be discussed by the council. Where such councils have not been established, relevant organisations are invited to a discussion meeting.

NEA sends its proposals on a national hearing. EU and Russia are invited to comment on the proposals regarding the fisheries in the northernmost county and in southern parts of Norway. The Sámi Parliament is consulted at certain stages of the regulatory process.

In rivers where regulations are based on local proposals, the fishery and salmon run must be assessed mid-season. If there is a risk that the spawning target will not be met, pre-agreed measures may be implemented. A specific toolkit, consisting of a procedural memo and specially adapted spread sheets for each individual river, has been developed for this assessment.

Trigger levels:
If the catch by the end of June is less than 50% last five years average, bag- and bend net season will be reduced by 50% for the rest of the season. Angling season in relevant rivers will be ended two weeks earlier than normal.

Mid season assessment and pre agreed measures

Mid season assessment result	Measure
≥130% of spawning target attainment	Possible to increase harvest (quotas /season)
90-130 % of spawning target atainment	No change in harvest level required
50 - 90 % of spawning target attainment	Reduced quaotas and/or lenght of season
≤ 50 % of spawning target attainment	No additional mortality due to angling

2.3 (a) Are any fisheries permitted to operate on salmon stocks that are below their reference point (e.g. Conservation Limits)? If so, (b) how many such fisheries are there and (c) what approach is taken to managing them that still promotes stock rebuilding? *(Max 200 words)*
(Reference: Section 2.7 of the Fisheries Guidelines)

(a) Yes, in some rivers and in coastal and fjord fisheries.

(b) In the classification of 448 salmon stocks according to the Norwegian quality norm for atlantic salmon, angling for salmon was permitted in two rivers which didn't produce a harvestable surplus in the period 2010-2014. Ten stocks without a surplus was assessed as minor overexploited due to distant costal fisheries (angling and bag net fisheries in nearby sea areas is forbidden). Available information where insufficient to assess harvestable surplus in 264 rivers.

In 2018 SACAS found that out of 195 assessed salmon stocks, management targets for the period 2013-2016 were attained, or likely attained, for 91% of the populations, when the uncertainty in both the spawning targets and the estimated attainment of the spawning targets were considered.

(c) Implemented regulations reflect the gap between the management target and estimated target attainment, so that the measures taken get stricter the greater the gap. Spawning target attainment are assessed anually, if the development is not positive, stricter regulation will be applied. In rivers and nearby sea areas where harvesting will compromise stock rebuilding, salmon fisheries are not allowed.

The Tana fishery agreement are based on information about the status of the stocks and aimed at reducing fishing mortality by one third of the earlier mixed-stock fishing in the Tana mainstem fisheries. See Finland's Implementation plan for further information.

2.4 (a) Are there any mixed-stock salmon fisheries? If so (b) how are these defined, (c) what was the mean catch in these fisheries in the last five years and (d) how are they managed to ensure that all the contributing stocks are meeting their conservation objectives? *(Max. 300 words in total)*
(Reference: Section 2.8 of the Fisheries Guidelines)

(a) Yes

(b) A mixed-stock fishery is a fishery exploiting salmon from two or more river stocks. Mixed-stock fisheries include both fjord and coastal fisheries, and fisheries in the main stem of certain large rivers with several tributary river stocks.

(c) 265 763 kg.

(d) SACAS gives scientific advice as a basis for regulating the fisheries. Advice is given in five semi quantitative categories depending on the assessed average probability for achievement of spawning targets over the last four seasons in any given stock (the management target would be 75 % probability or higher). Starting with a low probability (20 % or lower) resulting in advice to reduce fishing pressure very much.

Similar advice is given by the SACAS at an aggregated level for 23 salmon fishery regions in fjords and coastal areas resulting in similar regulatory responses. Fishing season is used as a primary means to reach the management targets. In several sea areas and in 98 rivers fishing for salmon is not permitted, because of unattained target or unsufficient information of stock status

2.5 How are socio-economic factors taken into account in making decisions on management of salmon fisheries? *(Max. 200 words)*
(Reference: Section 2.9 of the Fisheries Guidelines)

To facilitate stakeholder participation and influence in salmon fisheries, several regional councils have been established. On a national level, salmon advisory and consultation meetings are normally held once or twice a year. The Norwegian Environment Agency sends its proposals on fishing regulations on a hearing, where the public can give input. Over the last decade, local management bodies in salmon rivers have been given greater responsibility, especially local river-by-river organizations of landowners and fishing right holders.

The national government has consultation obligations with the Sami Parliament. This is governed by an agreement between the Government and the Sami Parliament.

When taking socio-economic factors into account, a consequence is allowing harvesting on some weak salmon stocks, for instance when allowing fishing on mixed stocks.

2.6 What is the current level of unreported catch and what measures are being taken to reduce this? *(Max. 200 words)*
(Reference: Section 2.2 of the Fisheries Guidelines and the Minimum Standard)

Unreported catches are estimated to 30% total catch.

Key for estimates of distribution of unreported catches:

Total catch, reported and unreported catches

	Catch %	Example catch Tonnes
Total catch	100	876
Reported catch	70	613
Unreported catch *)	30	263

Distribution unreported catch	%	Tonnes
Illegal takes in sea	25	66
By-catch by commercial sea fishing	5	13
Legal takes in sea by bag-net and bend net	25	66
Legal takes in sea by angling	20	53
Illegal takes in rivers	5	13

Legal takes in rivers, mainly by angling	20	53

Total unreported	100	262,71

*) Uncertainty = 25%

See Threat/challenge F4/Action F4 for further information.

2.7 Has an assessment under the Six Tenets for Effective Management of an Atlantic Salmon Fishery been conducted? If so, (a) has the assessment been made available to the Secretariat and (b) what actions are planned to improve the monitoring and control of the fishery? (c) If the six tenets have not been applied, what is the timescale for doing so? *(Max. 200 words)*
(Reference: Six Tenets for Effective Management of an Atlantic Salmon Fishery, WGCST(16)16)

(a) An assessment under the six tenants is included in Norwegian salmon management. Except for recreational anglers in sea, a registration system is in place for anglers in fresh water and bag-, and bend nets fishermen in the sea. By the end of the season, the number of participants in various fisheries is known. All fisheries are regulated with quotas and/or limited catch period as described in section 2.2. The spawning run is assessed by SACAS in 195 rivers comprising 90 % of overall salmon river catches and 93% of the total Norwegian spawning target. Reporting all salmon catches is mandatory, and SACAS assesses the accuracy of catch reports from rivers fisheries. Spawning target attainment is assessed annually, but fisheries are regulated for a five years period, unless annual assessments reveal a need for immediate action. The regulatory process is described in section 2.2 and regulations are published on the official website www.Lovdata.no.

(b) The control of fisheries is carried out by local supervision, the Norwegian Nature Inspectorate, the Coast Guard and the police. The inspections are partly risk based, and the Nature Inspectorate confiscates approximatly 2 km of illegal nets annually. The effort to reveal illegal fisheries are increasing, a revision of legislation to sharpen sanctions is in process.

(c) The assessment will be provided to the Secretariat in 2020.

2.8 Identify the threats to wild salmon and challenges for management associated with their exploitation in fisheries, including bycatch of salmon in fisheries targeting other species.

Threat / challenge F1	Insufficient knowledge on sea survival and the factors affecting sea survival on a national and regional scale. The effects of sea lice on fish populations cause special challenges predicting the number of returning salmon. Increased knowledge on sea survival permits more precise management measures and increased target attainment, expecially among smaller rivers with no or little stock information.
Threat / challenge F2	Illegal fisheries
Threat / challenge F3	Overexploitation.
Threat / challenge F4	Unreported catches. 20% of unreported catches is estimated to be legal catches in sea by anglers. Until now it has not been possible to report these catches.
Threat/ challenge F5	Spawning targets need further development

Copy and paste lines to add further challenges which should be labelled F5, F6, etc.

2.9 What SMART actions are planned during the period covered by this Implementation Plan (2019 – 2024) to address each of the threats and challenges identified in section 2.8 to implement NASCO's Resolutions, Agreements and Guidelines and demonstrate progress towards achievement of its goals and objectives for the management of salmon fisheries?		
Action F1:	Description of action:	Development, testing and evaluation of an expanded sea survival surveillance program.
	Planned timescale (include milestones where appropriate):	→ 2024. A program of expanded sea survival surveillance has been developed. Test period → 2021. Evaluation of test period and adjustment of program if needed 2022-2024.
	Expected outcome:	Increased knowledge about salmon recrutiment, growth and sea survival at a national and regional scale.
	Approach for monitoring effectiveness & enforcement:	Monitor factual progress against planned progress
	Funding secured for both action and monitoring programme?	Yes
Action F2:	Description of action:	(a) Increased effort to reveal and sanction illegal fisheries. (b) Revision of salmon and inland fisheries act to introduce stricter reactions to violation of legislation.
	Planned timescale (include milestones where appropriate):	2019 - 2021
	Expected outcome:	Reduction in illegal fisheries
	Approach for monitoring effectiveness & enforcement:	(a) Scope of fishery inspection and number of revealed offences. (b) Revised legislation.
	Funding secured for both action and monitoring programme?	Yes
Action F3:	Description of action:	Major revision of regulatory measures in rivers and in mixed-stock fisheries in the sea for the period 2021-2026.
	Planned timescale (include milestones where appropriate):	2019-2021 Revised guidelines: ultimo January 2020 National hearing: mid June 2020 Revised legislation approved January 2021
	Expected outcome:	-Adjusted fisheries regulations -Reduced overexploitation due to updated regulatory measures.
	Approach for	-Revised regulations

	monitoring effectiveness & enforcement:	-Annual assessment of numbers of rivers attaining their management target. -Monitoring spawning target attainment.
	Funding secured for both action and monitoring programme?	Yes
Action F4:	Description of action:	Development of an electronic system to make reporting of catches in the sea by recreational anglers possible.
	Planned timescale (include milestones where appropriate):	2020 onwards
	Expected outcome:	Reduction in unreported catches
	Approach for monitoring effectiveness & enforcement:	Number of users and reported catches by anglers in the sea.
	Funding secured for both action and monitoring programme?	Yes
Action F5:	Description of action:	Introduction of second-generation spawning targets. A revised approach for setting spawning targets has been developed (2020). The new approach will be tested in several rivers in 2021. Depending on the outcome of the test, revised spawning targets will be implemented for all rivers with salmon stocks from 2022 and onwards.
	Planned timescale (include milestones where appropriate):	2021-2024. Milestone: 2021 Test results are reported. Depending on test results: From 2022 and onwards, implementation of revised approach for setting revised spawning target in 100 additional rivers each year.
	Expected outcome:	More precise spawning targets and better stock management.
	Approach for monitoring effectiveness & enforcement:	Number of rivers with revised spawning targets.
	Funding secured for both action and monitoring programme?	Yes

3. Protection and Restoration of Salmon Habitat:

In this section please review the management approach to the protection and restoration of habitat in your jurisdiction in line with the relevant NASCO Resolutions, Agreements and Guidelines.

3.1 How are risks to productive capacity identified and options for restoring degraded or lost salmon habitat prioritised, taking into account the principle of 'no net loss' and the need for inventories to provide baseline data? *(Max. 200 words)* (*Reference: Section 3 of the Habitat Guidelines)*

A risk assessment including the risks for further loss of productive capacity in salmon rivers is conducted annually by SACAS. The risk for further loss due to hydropower development and acidification is low

Regulated salmon rivers have terms which include rules and demands for mitigation measures. Revision of licence to modern conditions for operation (environmental flow) is addressed in several rivers. The potential for further mitigation measures in regulated rivers have recently been assessed as a part of the implementation of the EU Water Framework Directive (WFD). The Ministry have prioritized regulated salmon rivers which shall be given modern conditions for operation.

In "National Salmon Rivers", there are restrictions against all physical and chemical impacts that might reduce habitat productivity.

An application for a river project of any kind shall include a study report describing the environmental pro and cons of the project. In rivers inhabited by anadromous salmonids the study shall at least include spawning and rearing areas affected and possible mitigation measures, for example environmental flow or habitat improvements.

In the classification og the first 101 salmon rivers in accordance to the National Quality Norm for Wild Salmon, an inventory of net loss of smolt production due to reduced or altered water flow has been conducted.

3.2 How are socio-economic factors taken into account in making decisions on salmon habitat management? *(Max. 200 words)*
(Reference: Section 3.9 of the Habitat Guidelines)

Socio-economic factors are a part of the EIA in a hydropower project. It includes possible consequences for industry and commerce, social factors, public health issues, population development etc.

The socio-economic factors are considered in the process of judging whether a project including habitat mitigations should be granted in the licensing process.

3.3 What management measures are planned to protect wild Atlantic salmon and its habitats from (a) climate change and (b) invasive aquatic species? *(Max. 200 words each)*
(Reference: Section 3.2 of the Habitat Guidelines)

(a)
Climate change can include several different factors: i) dryer and warmer summer, and ii) mild winters with increased precipitation. These scenarios will eventually differently affect Norwegian salmon populations. However, especially the i) scenario is of most concern. At present, no management measures are planned for either scenarios in rivers inhabiting anadromous salmonids. If climate change affects a salmon population in a regulated river, the authorities has the necessary means to impose relevant mitigating measures or evaluate the conditions of the license.

(b)
The invasion of Pink salmon (*Oncorhynchus gorbuscha*) is considered as a threat to Norwegian Atlantic Salmon stocks. Pink salmon is assessed as having “high ecological risk” on the Norwegian Biodiversity Information Centre’s list of alien species, see Action A4.

Other alien species listed as “high ecological risk” is rainbow trout (*Oncorhynchus mykiss*), minnow (*Phoxinus phoxinus*) and northern pike (*Esox lucius*). For these species, monitoring is carried out. Measures will be considered if the impact is significant.

3.4 Identify the main threats to wild salmon and challenges for management in relation to estuarine and freshwater habitat.

Threat / challenge H1	Acidification
Threat / challenge H2	Hydro power development
Threat / challenge H3	Other habitat deterioration

3.5 What SMART actions are planned during the period covered by this Implementation Plan (2019 – 2024) to address each of the threats and challenges identified in section 3.4 to implement NASCO's Resolutions, Agreements and Guidelines and demonstrate progress towards achievement of its goals and objectives for the Protection, Restoration and Enhancement of Atlantic Salmon Habitat?		
Action H1:	Description of action:	Long-term liming of 24 acidified salmon rivers.
	Planned timescale (include milestones where appropriate):	2016-2021 (new plan for liming rivers in Norway 2022-2027 is being prepared)
	Expected outcome:	Restored salmon stocks and fishing possibilities
	Approach for monitoring effectiveness & enforcement:	Biennially surveys on juvenile salmon populations and mandatory reports of annual river catches of salmon
	Funding secured for both action and monitoring programme?	Yes
Action H2:	Description of action:	Mitigation measures for improved salmon habitat in regulated rivers
	Planned timescale (include milestones where appropriate):	Continuously. Development of five habitat plans in regulated rivers each year fra 2021-2024.
	Expected outcome:	Restored fish habitat and increased salmon production in regulated rivers
	Approach for monitoring effectiveness & enforcement:	Monitoring number of habitat plans and effectiveness of mitigation measures in regulated rivers
	Funding secured for both action and monitoring programme?	Yes
Action H2-2:	Description of action:	Revision of terms for hydropower production licenses and address of rules of operation, in several rivers.
	Planned timescale (include milestones where appropriate):	This is an ongoing process started in early 2000'ies and will continue for years. After revision, a potential new revision of terms and rules of operation can take place every 30 years. All relevant stakeholders will be included in the process. Mostly, NGO's and local authorities are taking initiative for a revision of terms and rules of operation for hydropower licenses. Based on similar finished cases in recent years, it can take years from starting the process to new terms are set. In the River Basin Management Plan according to the Water Framework Directive, 8 regulated salmon rivers have been prioritised to improve conditions for salmon.

	Expected outcome:	The result of the process will vary among rivers. The salmon habitat is one of several factors that will be evaluated. Main mitigating measures include environmental flow.
	Approach for monitoring effectiveness & enforcement:	Revision of terms for hydropower regulation licenses is the main tool to improve conditions for salmon in regulated rivers, by revising the terms of operations. By October 2021 47 cases are ongoing, in the following stages: (One case may contain several licenses) - 12 cases have been suggested for revision - 5 cases are opened - 24 cases have produced the background documented needed for hearing and further handling - 6 cases are finished by the directorate and handled to the ministry for final decision. 17 cases are finalised and have been given a new set of license conditions including terms of operations. 3 of these are in salmon rivers.
	Funding secured for both action and monitoring programme?	Yes
Action H3:	Description of action:	Improving salmon habitat in rivers altered to improve security during flood.
	Planned timescale (include milestones where appropriate):	This is an ongoing process evaluating rivers and stretches for possible improvements.
	Expected outcome:	Improved rearing conditions when closed rivers sections are opened and influenced by regular changes in the hydrological regime.
	Approach for monitoring effectiveness & enforcement:	Norway has reported rivers where measures (e.g. for opening old floodplains) have been undertaken at flood protection facilities that also safeguard the salmon stock and other elements of biological diversity. This action has previously been descriptively reported. No national target has been set. Norway has not defined an objective of a certain number of rivers that will implement such measures. In Norway, other challenges than flood protection facilities are considered to be of more importance to salmon. In some cases, a flood event can destroy older flood protection constructions. When such constructions are to be repaired, environmental measures can be undertaken at det same time. It will therefore be very hard to plan for such measures. No further monitoring is planned.
	Funding secured for both action and monitoring programme?	Yes
4. Management of Aquaculture, Introductions and Transfers, and Transgenics:		

Council has requested that for Parties / jurisdictions with salmon farms, there should be a greater focus on actions to minimise impacts of salmon farming on wild salmonid stocks. Each Party / jurisdiction with salmon farming should therefore include at least one action relating to sea lice management and at least one action relating to containment, providing quantitative data in Annual Progress Reports to demonstrate progress towards the international goals agreed by NASCO and the International Salmon Farmers Association (ISFA):

- *100% of farms to have effective sea lice management such that there is no increase in sea lice loads or lice-induced mortality of wild salmonids attributable to the farms;*
- *100% farmed fish to be retained in all production facilities.*

In this section please provide information on all types of aquaculture, introductions and transfers, and transgenics (including freshwater hatcheries, smolt-rearing etc.

4.1 **(a) Is the current policy concerning the protection of wild salmonids consistent with the international goals on sea lice and containment agreed by NASCO and ISFA? (b) If the current policy is not consistent with these international goals, when will current policy be adapted to ensure consistency with the international goals and what management measures are planned to ensure achievement of these goals and in what timescale?** *(Max. 200 words for each)*
(Reference: BMP Guidance)

(a)
The current Norwegian policy regarding sea lice is not entirely consistent with the goal agreed by NASCO and ISFA, as a certain lice-induced mortality of wild salmonids attributable to the farms is accepted.

The current policy regarding containment is consistent with the international goal as the Norwegian government has a vision of zero escapees.

b)
Sea lice:
The Norwegian Parliament has decided that a certain lice-induced mortality of wild salmonids attributable to the farms is accepted. This is not entirely consistent with the goal agreed by NASCO and ISFA. This decision and its impacts are described in details in NASCO Council document CNL(16)41.

However, we closely regulate sea lice at every farm, with a high level of supervision and control. According to national regulations every farm should have levels below 0,5 female sea lice per fish at all time, and in the spring when the wild salmon smolt is migrating from the rivers, the limit is 0,2. Although most farms have sea lice levels well below the maximum limit, in some areas the aggregated impact from all the farms in the area can be high. The current policy is therefor that the aggregated impact from all farms in an area should be within an acceptable level (the traffic light system). If not, the production capacity will be reduced in the relevant production area. Capacity is adjusted every two years. Models, threshold values and monitoring programs are continuously evaluated and improved when possible. This holds true also for regulations, and control regimes.

4.2 **(a) What quantifiable progress can be demonstrated towards the achievement of the international goals for 100% of farms to have effective sea lice management such that there is no increase in sea lice loads, or lice-induced mortality of wild salmonids attributable to sea lice? (b) How is this progress monitored, including monitoring of wild fish? (c) If progress cannot be demonstrated, what additional measures are proposed and in what timescale?** *(Max. 200 words each)*
(Reference: BMP Guidance)
The measures by which these goals may be achieved, and against which the Review Group will be measuring the effectiveness of the Implementation Plan, are set out in the BMP Guidance SLG(09)5 (Best management practice; reporting and tracking; factors facilitating

implementation) as agreed by NASCO and ISFA.

a)
Norwegian authorities work towards ensuring that sea lice do not have an unacceptable impact on wild salmon stocks, ref The Traffic Light System.

The Traffic Light system enables a reduction in the industry's production capacity if the estimated salmon lice-induced mortality in Atlantic salmon is unacceptable.

This system started in 2017, and we are now gaining experience with the system and the monitoring on which the system relies. In 2017, 8 production areas were green (low impact), 3 yellow (moderate impact) and 2 red (unacceptable impact). In 2019, 9 production areas were green (low impact), 2 yellow (moderate impact) and 2 red (unacceptable impact). Consequently, in 2020 the two red areas had their production capacity reduced.

(b) We are monitoring sea lice loads on wild salmonids in fjord systems (Surveillance program for sea lice on wild salmon (NALO) which enable us to estimate the effect of sea lice on the Atlantic salmon in about 400 watercourses. The results have been published in reports that show the situation for every watercourse in the period 2012-2018.

On the website Barentswatch.no the information about the number of lice, which treatment etc. on every sea farm both currently and retrospective is publicly available. This system is continuously developed and improved.

(c) Norwegian authorities work towards ensuring that sea lice do not have an unacceptable impact on wild salmon stocks, ref the Traffic light system. In addition, the legal framework and guidelines relevant for sea lice management is continuously being improved:
A new regulation for sea lice is being drafted. It will regulate the management of sea lice in the farm considering impact on wild salmon as well as the health and welfare of the farmed fish. The new regulations are expected to be in place in 2021/22.

Through a new type of licences aiming at mitigating environmental challenges, there is now a major focus on developing new technology to reduce the impact from salmon lice as well as reducing chances of escapes. The effect of the measure will appear in the coming years.

4.3 (a) What quantifiable progress can be demonstrated towards the achievement of the international goals for achieving 100% containment in all (i) freshwater and (ii) marine aquaculture production facilities? (b) How is this progress monitored, including monitoring of wild fish (genetic introgression) and proportion of escaped farmed salmon in the spawning populations? (c) If progress cannot be demonstrated, what additional measures (e.g. use of sterile salmon in fish farming) are proposed and in what timescale? *(Max. 200 words each)*
(Reference: BMP Guidance)
The measures by which these goals may be achieved, and against which the Review Group will be measuring the effectiveness of the Implementation Plan, are set out in the BMP Guidance SLG(09)5 (Best management practice; reporting and tracking; factors facilitating implementation) as agreed by NASCO and ISFA.

(a)(i/ii)

Tab. Reported numbers of escaped fish and (escapes) from fish farms in fresh water and sea water from 2017-2019.

	2017	**2018**	**2019**	**2020**
Freshwater	1049 (2)	21 801 (5)	17 459 (8)	104
Seawater	75 178 (40)	139 929 (39)	298 625 (43)	44 472

The main focus has been (and will continue to be) on preventing escapes through relevant regulations implementing technical standards (NS9415 for floating installations and NS9416 for landbased installations) and active control-regimes and supervision. The number of salmonid escapees has shown a declining trend i recent years. From a top in 2006 on nearly 1.000 000 and down to 44 500 in 2020 (numbers include escapees from both freshwater and marine aquaculture facilities). All relevant statistics regarding escapes are available at the webpages of the Directorate of Fisheries. Although the numbers of escapees are an important figure the most important number for the genetic integrity is the prevalence of escaped salmon in the rivers and on the spawning grounds. The national program for monitoring escaped salmon in rivers show a steady decrease of this prevalence. For further details, see the report Rømt oppdrettslaks i vassdrag i 2020 | Havforskningsinstituttet (hi.no).

(a)(i)
From 2018 new regulations on land-based aquaculture facilities was introduced to further reduce risk of escape incidents, by making compliance with NS9416 compulsory.

(b)
The Norwegian government has a vision of zero escapes. However, escapes do still occur, and all previous escapees have not been removed. Thus, we have a National program for monitoring escaped salmon in rivers: On a yearly basis, approximately 200 rivers are monitored through a number of methods to calculate the prevalence of escaped salmon in the spawning populations. The results from the 2020 program shows that the prevalence was further reduced from 2019. The results from the 2020 program shows that in 13 of 218 rivers monitored, the prevalence was high (more than 10 %, which is considered unacceptable), in 27 rivers the prevalence was moderate (4-10 %), and in 178 rivers the prevalence was low (less than 4 %).

Based on this, active removal of salmon takes place in several programmes, including both the Directorate of Fisheries and the aquaculture industry (OURO), through regulations under the Aquaculture act. All farmed fish discovered during monitoring are removed. In addition, OURO are to consider removal measures in rivers with prevalence of 4 % or more. In all rivers with more than 10 % measures for removal fish are mandatory.

The monitoring program shows a steady decline in the proportion of escaped salmon in Norwegian rivers since 20106, demonstrating progress towards achieving the goal of minimizing impact of salmon farming in line with NASCO's goal.

There is also a program monitoring genetic integrity in salmon rivers. 175 rivers (Fig. 1) has been included so far, and the number of rivers included is expected to increase in the years to come.

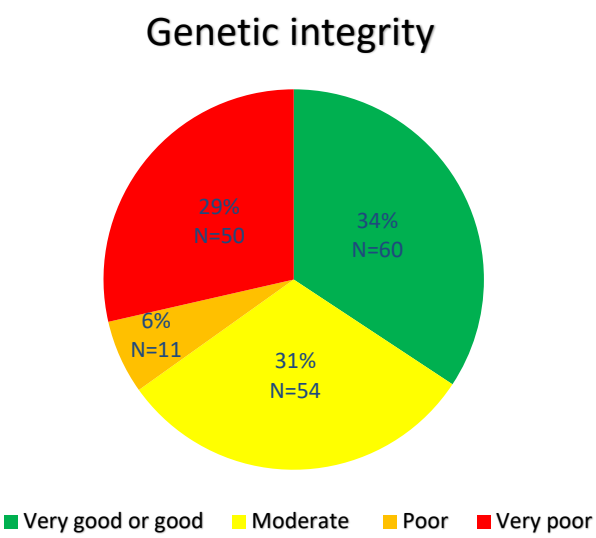


Figure 1 Genetic status of 175 Norwegian salmon populations classified as very good or good (no genetic alterations), moderate (1-4 % introgression), poor (4-10 % introgression) or very poor (≥10% introgression).

(c) Revised regulations aiming to reduce escapes have now been sent on public hearing.

4.4 What adaptive management and / or scientific research is underway that could facilitate better achievement of NASCO's international goals for sea lice and containment such that the environmental impact on wild salmonids can be minimised? *(Max 200 words)*
(Reference: BMP Guidance and Article 11 of the Williamsburg Resolution)

Regarding sterile fish, special licences has been issued to gain experience with farming sterile Atlantic salmon in commercial size fish farms, in addition to several research projects. There are still challenges regarding fish health and -welfare in the production of sterile fish that needs to be solved before this can be a commonly available technique.

Through the Norwegian Research Council, several programmes are working on issues like sea lice, identification of escaped farmed salmon, production of sterile fish and determining the ecological effects on wild populations of salmonids.

Through issuing special licenses for developing new technologies for salmon farming, the government have given the industry strong incentives for focusing on strategies aiming at reducing both salmon escapes and negative effects from salmon lice.

The Norwegian Seafood Research Fund (FHF) is the Norwegian seafood industry's tool in managing the industry's investments into industry-based R&D. It's financed by the fishery and aquaculture industry.

The Sea Lice Research Centre (SRLC) do research-based innovation appointed by the Research Council Norway. The Centre is hosted by the University of Bergen and started the activity in September 2011. Results from the SLRC will enable an integrated control system to be established, based on key features in sea lice biology, to improve sustainability of the salmon farming industry.

4.5 What is the approach for determining the location of aquaculture facilities in (a) freshwater and (b) marine environments to minimise the risks to wild salmonid stocks? *(Max. 200 words for each)*

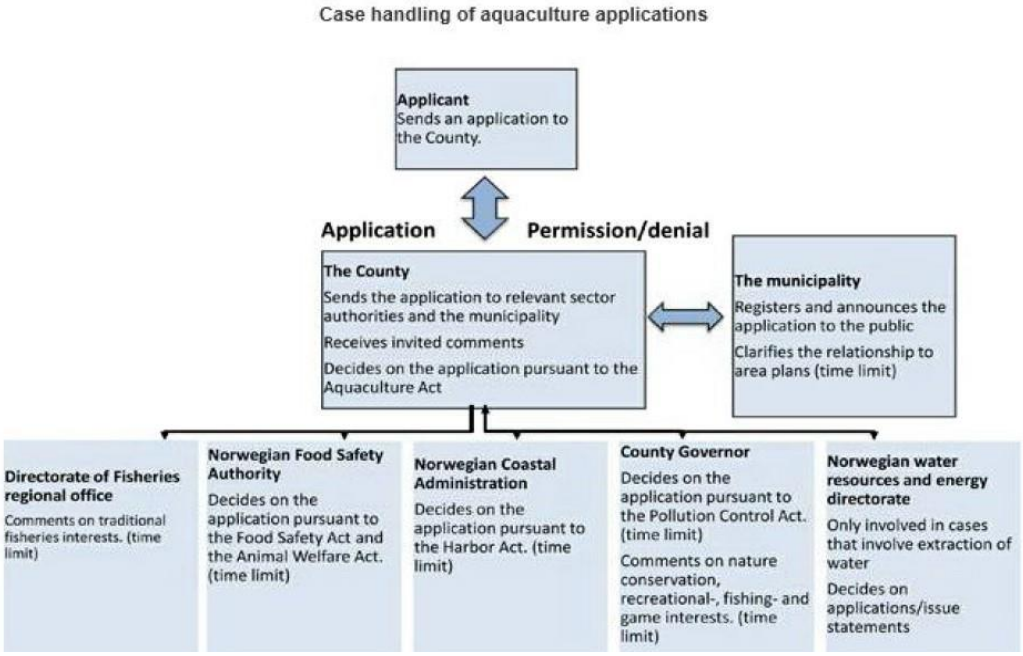
(a+b) The Aquaculture Act, states that aquaculture facilities shall be established, operated and abandoned in an environmentally responsible manner. This include taking local populations of wild

salmonids into consideration when determining suitable location for aquaculture.

Furthermore, along the Norwegian coast, areas of special importance to wild Atlantic salmon has been given status as National Salmon Fjords and National Salmon Rivers, and are thus given special protection. Through the Production Area regulations, further growth in production shall be governed by the effect of salmon lice on wild salmonids, where increase/maintain/reduction of production capacity are determined on level of added mortality from salmon lice on wild salmonid populations.

The procedure for allocation sites for both for freshwater and marine aquaculture is described in this figure:

The applicant sends an application to the County, that consults different public authorities in order to give permission or denial.



Possible impacts on wild salmon will be taken into consideration when determining locations of aquaculture facilities (statement given by County Governor in the figure above).

(b)
Cf, the listed point above

4.6 What progress has been made to implement NASCO's guidance on introductions, transfers and stocking? *(Max. 200 words)*
(Reference: Articles 5 and 6 and Annex 4 of the Williamsburg Resolution)

Living or viable organisms may only be imported to Norway subject to a permit granted by the competent authority under the Nature Diversity Act. If an organism is imported with a view to release it into the environment, the application for a permit shall clarify the possible effects of such release on biological diversity. No permit may be granted if there is reason to believe that the import will have substantial adverse impacts on biological diversity. Without legal authority no person must release organisms, to the sea or a river system unless a permit has been granted.

In general, stocking is considered as a temporary measure and the goal is to secure natural production in all rivers. Nevertheless, there are some exceptions. Stocking to mitigate the effects of hydropower developments might lead to more permanent stocking measures if natural production cannot be restored. Even so, stocking by hydropower companies is under review in order to identify alternative measures, such as habitat restoration, that could replace stocking.

4.7 Is there (a) a requirement to evaluate thoroughly risks and benefits before undertaking any stocking programme and (b) a presumption against stocking for purely socio-political / economic reasons? *(Max. 200 words each)*
(Reference: Guidelines for incorporating social and economic factors in decisions under the Precautionary Approach and Annex 4 of the Williamsburg Resolution)

(a)
Yes. All stocking must be based on an approved plan specific to the population and must contain documentation on the river system, the stock and bottlenecks to natural production. The plan must describe why stock enhancement is necessary and provide a description of the objective for the activity. The plan must detail the aims of the activity and a plan for when the stocking will end. In 2014 the Norwegian Environment Agency developed new guidelinges for stock enhancement for anadromous salmonids. The Guidelines have implemented new scientific knowledge on the risks and benefits of stock enhancement, taking account of national and international recommendations, including NASCO's Guidelines for Stocking Atlantic Salmon contained in the 'Williamsburg Resolution', CNL(06)48.

Only local broodfish, preferably of non-stocking orgin are allowed. Enforced broodfish control are introduced to ensure that the genetic variability in the population is maintained. All stocked fish must be identifiable. A guidebook on how to avoid/minimise the negative effects from stocking in terms of the loss of genetic variation and genetic integrity of fish populations are available.

(b)
The stocking guidelines are founded on conservation biology principles. This implies that the focus is changed from stock enhancement for socio-political/economic reasons towards conservation reasons. To preserve the original population and its genetic variability, measures to remove limits on natural production (like habitat restoration) shall be prioritised. Stock enhancement shall not be a substitution for insufficient regulation of fisheries.

4.8 What is the policy / strategy on use of transgenic salmon? *(Max. 200 words)*
(Reference: Article 7 and Annex 5 of the Williamsburg Resolution)

Norway has a strict policy on the use of transgenic organisms in general. There is thus no use of transgenic salmon in Norwegian aquaculture.

4.9 *For Members of the North-East Atlantic Commission only:* What measures are in place, or are planned, to implement the eleven recommendations contained in the 'Road Map' to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of *Gyrodactylus salaris* and eradicate it if introduced, including the development and testing of contingency plans? *(Max. 200 words)*
(Reference 'Road Map' to enhance information exchange and co-operation on monitoring, research and measures to prevent the spread of G. salaris and eradicate it if introduced, NEA(18)08)

The Norwegian national surveillance program for G. salaris in Atlantic salmon includes inspections and sampling in all hatcheries for commercial fish farming as well as all hatcheries for restocking of rivers. There is a risk-based selection of rivers, including the following rivers in the program:

• Rivers declared free after treatment
• The 30 rivers with largest stocks of Atlantic salmon
• Rivers with high risk of being infected by migrating fish
• Rivers of other risk values with geographical proximity to infested rivers and/or rivers where there are activities that have the potential to spread the parasite, i.e. rafting

The surveillance programme includes an epidemiological surveillance to find out more about

how the river could have been infected, and what to do with the situation. It also includes a post treatment program that monitors the rivers for about 5 years before they can be declared free from G. salaris. After the treatment, fish from the Norwegian gene bank will be used to re-establish the stock.

The National Food and Safety Authority (NFSA) has made a contingency plan for regional and central level in the NFSA that states who will do what, when and how. There is also an action plan that contains measures and collaboration between different institutions and government levels involved (the NFSA, The Norwegian Environmental Agency, the county governors, and the Norwegian Veterinary Institute (NVI)).
Posters, brochures and internet pages in different languages has been developed to inform about the risk of introducing G. salaris and how to avoid such introduction to the public. We collaborate with all our neighbour countries to avoid the parasite being spread from these countries.

Development of monitoring and methods:
Regarding monitoring, a method using e-DNA has been developed that can be more effective when screening a watercourse than traditional sampling and morphological methods. NVI has used this method for some years, and they are gaining experience with it. Traditionally, rotenone has been used when combatting G. salaris infection in a river. This chemical kills both parasites and hosts, and a lot of other aquatic animals. A new method, using aluminium phosphate in combination with rotenone enables the host to survive. One infected river has successfully been treated with this method so far.

4.10 Identify the main threats to wild salmon and challenges for management in relation to aquaculture, introductions and transfers, and transgenics.	
Threat / Challenge A1	Genetic interaction and escaped farmed fish are a threat to wild salmon. Increased effort is necessary to reduce the effects and find ways to avoid the influence from farmed salmon.
Threat / challenge A2	Sea lice is a treat to many wild salmonid stocks. Authorities have shifted the focus from considering the sea lice levels in fish farms only, but is also taking the sea lice infestations on wild salmonids into account when deciding upon measures in aquaculture.
Threat / challenge A3	*Gyrodactylus salaris*
Threat / challenge A4	Several alien species are spread and threaten local populations of Atlantic salmon. Among these species are pink salmon (*Oncorhynchus gorbuscha*). In 2017, Pink salmon was found in large quantities all along the Norwegian coast. Pink salmon is assessed as having "high ecological risk" on the Norwegian Biodiversity Information Centre's list of alien species.

Copy and paste lines to add further threats/challenges which should be labelled A5, A6, etc.

4.11 What SMART actions are planned during the period covered by this Implementation Plan (2019 – 2024) to address each of the threats and challenges identified in section 4.10 to implement NASCO's Resolutions, Agreements and Guidelines and demonstrate progress towards achievement of its goals and objectives for aquaculture, introductions and transfers, and transgenics?		
Action A1-1:	Description of action:	Mainly because of impacts from genetical introgression from escaped farmed salmon on wild populations of salmon, and of impacts from sea lice on salmonid stocks the Norwegian Government in 2013 decided to establish a live Gene Bank for the Hardangerfjord area. Approximately 20 stocs in this

		region will be conserved in the gene bank. Simultanously a supplementation of the samples from the current stock in the cryogenetic genbank will be completed.
	Planned timescale (include milestones where appropriate):	On-going. All action- points are planned to run for the full period of the implementation plan, 2019 – 2024
	Expected outcome:	Reduced hybridisation between wild and farmed fish, with a qualitative improvement in genetic integrity at population level.
	Approach for monitoring effectiveness & enforcement:	Consider all relevant statistics and monitoring programs and see if the number of escapees is reduced from the farms, as well as in the rivers. The Directorate of Fisheries will investigate episodes concerning strayed/farmed salmons found in fjords and rivers and will when possible track the fish to the farm of origin and use this knowledge to optimize the control regimes.
	Funding secured for both action and monitoring programme?	Yes
Action A1-2:	Description of action:	Further improvement of precautionary measures e.g.: - Site based technical certificate for every fish farm in the sea. - Implementing a new technical standard NS9416 for land-based aquaculture facilities. - Continuously high focus on effective control regimes
	Planned timescale (include milestones where appropriate):	On-going. All action- points are planned to run for the full period of the implementation plan, 2019 - 2024
	Expected outcome:	Reduced hybridisation between wild and farmed fish, with a qualitative improvement in genetic integrity at population level.
	Approach for monitoring effectiveness & enforcement:	Continuously evaluate reports from scientists and fish farmers using sterile fish.
	Funding secured for both action and monitoring programme?	Expected
Action A1-3:	Description of action:	Establish more experience with farming sterile fish n commercial fish farms and research into the production of sterile farmed salmon.
	Planned timescale (include milestones where appropriate):	On-going. All action- points are planned to run for the full period of the implementation plan, 2019 - 2024
	Expected outcome:	Reduced hybridisation between wild and farmed fish, with a qualitative improvement in genetic integrity at population level.
	Approach for monitoring effectiveness & enforcement:	Evaluation of programs and studies made by relevant research institutions.

	Funding secured for both action and monitoring programme?	Expected
Action A1-4:	Description of action:	Further developing and improving the National monitoring program of escaped salmon in the rivers. This means: - including relevant rivers when data quality is sufficient, - testing and evaluating relevant field methods for monitoring escaped salmon - further standardising methods for analysing data from monitoring activities.
	Planned timescale (include milestones where appropriate):	On-going. Are planned to run for the full period of the implementation plan, 2019 - 2024
	Expected outcome:	Reduced hybridisation between wild and farmed fish, with a qualitative improvement in genetic integrity at population level.
	Approach for monitoring effectiveness & enforcement:	Evaluation of programs and studies made by relevant research institutions.
	Funding secured for both action and monitoring programme?	Expected
Action A1-5:	Description of action:	Continue the efforts of removal of escaped fish in rivers before spawning season through OURO.
	Planned timescale (include milestones where appropriate):	On-going. All action- points are planned to run for the full period of the implementation plan, 2019 - 2024
	Expected outcome:	Reduced hybridisation between wild and farmed fish, with a qualitative improvement in genetic integrity at population level.
	Approach for monitoring effectiveness & enforcement:	Evaluation of programs and studies made by relevant research institutions.
	Funding secured for both action and monitoring programme?	Yes
Action A1-6:	Description of action:	The Norwegian Environment Agency funds a monitoring project on genetical integrity in wild Atlantic Salmon poulations.
	Planned timescale (include milestones where appropriate):	On-going. All action- points are planned to run for the full period of the implementation plan, 2019 - 2024
	Expected outcome:	Reduced hybridisation between wild and farmed fish, with a qualitative improvement in genetic integrity at population level.
	Approach for	Classification of genetic integrity is updated every fifth year in

	monitoring effectiveness & enforcement:	accordance to the Quality Norm for Atlantic salmon.
	Funding secured for both action and monitoring programme?	Yes
Action A2:	Description of action:	Continuous implementation of the Traffic Light System and the regulations related to production areas, and sea lice monitoring and control in fish farms.
	Planned timescale (include milestones where appropriate):	All action- points are planned to run for the full period of the implementation plan, 2019 - 2024
	Expected outcome:	Avoid unacceptable sea lice induced mortality on wild Atlantic salmon. Unacceptable level (red areas) is defined as the level where sea lice-induced mortality on wild salmon (*Salmo salar*) is more than 30 %, see 4.1 b.
	Approach for monitoring effectiveness & enforcement:	Monitoring this impact by using different scientific methods of modelling as well as monitoring in the field. Early reports on impact in the production areas from experts as a part of the Traffic Light System.
	Funding secured for both action and monitoring programme?	Expected
Action A3-1:	**Description of action:**	Eradicate G. salaris in the Driva (4 rivers) and Drammen (3 river) region. In the first region a fishing barrier has recently been made. In both regions fish are collected into the gene bank, ready for restocking after treatment period. The treatment with Rotenone, Acid Aluminium and/or Chlorine will start after some years of preparation and planning.
	Planned timescale (include milestones where appropriate):	All action- points are planned to run for the full period of the implementation plan, 2019 – 2024. Chemical treatment in the Driva region is planned to be completed in 2022 and 2003, and the eradication in the last region, the Drammen region, can start at the earliest in 2024.
	Expected outcome:	An optimistic prognosis is that the eradication of G. salaris in Norway is finalized in 2025, and that there will be no rivers left with this parasite after that. If everything goes according to plan, the Drivers region can be declared free og G. salaris in 2029 and the Drammen region a couple of years later.
	Approach for monitoring effectiveness & enforcement:	Treated rivers will be monitored closely over a period of 5 years after treatment before the disease can be declared as eradicated.
	Funding secured for both action and monitoring programme?	Expected
Action A3-2:	**Description of action:**	The surveillance programme: Includes an epidemiological surveillance to find out more about how the river could have

		been infected, and what to do with the situation. It also includes a post treatment program that monitor the rivers for about 5 years before they can be declared free from G. salaris. Regarding monitoring, a method using e-DNA has been developed that can be more effective when screening a watercourse than traditional sampling and morphological methods. NVI has used this method for some years, and they are gaining experience with it.
	Planned timescale (include milestones where appropriate):	On-going until the parasite is eradicated from all rivers
	Expected outcome:	Early detection of possible infection
	Approach for monitoring effectiveness & enforcement:	Annually G. salaris surveillance reports.
	Funding secured for both action and monitoring programme?	Yes
Action A3-3:	**Description of action:**	NFSA has made a contingency plan for regional and central level in NFSA that states who will do what, when and how in case of detection of G. salaris. There is also an action plan that contain measures and collaboration between different institutions and government levels involved (NFSA, The Norwegian Environmental Agency, the county governors, and the Norwegian Veterinary Institute (NVI)).
	Planned timescale (include milestones where appropriate):	On-going
	Expected outcome:	Enables quick action if the parasite is detected
	Approach for monitoring effectiveness & enforcement:	Existing contingency plans for different levels.
	Funding secured for both action and monitoring programme?	Yes
Action A3-4:	**Description of action:**	Posters, brochures and internet pages in different languages has been developed to inform about the risk of introducing G. salaris and how to avoid such introduction to the public. We collaborate with all our neighbour countries to avoid the parasite being spread from these countries.
	Planned timescale (include milestones where appropriate):	On-going
	Expected outcome:	Information that will help prevent further spread of the parasite
	Approach for monitoring effectiveness &	Existence of updated and available information.

	enforcement:	
	Funding secured for both action and monitoring programme?	Yes
Action A4-1:	**Description of action:**	As far as possible, prevent pink salmon from migrating up rivers to reproduce. The most important measure is to establish fish traps as far down into the rivers as possible. Here, pink salmon can be removed, and local species released into the river. Other capture methods will also be used.
	Planned timescale (include milestones where appropriate):	The measures will initially (2023) cover the northernmost parts of the country, with a particular focus on rivers near the Russian border, where the problem is greatest. In this area, fish traps will be used in several rivers. Initially, it will require manual sorting of fish, but automatic systems are under development. Measures will probably be needed in more rivers in 2025.
	Expected outcome:	A significantly smaller number of pink salmon spawning in rivers with implemented measures.
	Approach for monitoring effectiveness & enforcement:	The rivers upstream of the fish traps will be monitored to see how many pink salmon have managed to pass the trap.
	Funding secured for both action and monitoring programme?	Expected
Action A4-2:	**Description of action:**	Research projects will be carried out to obtain knowledge about the desired and undesirable effect of fish traps. More knowledge is also needed about the negative consequences of establishing pink salmon on ecosystems and water quality.
	Planned timescale (include milestones where appropriate):	ongoing
	Expected outcome:	Increase knowledge about pink salmon and measures to reduce the impact on natural populations of anadromous salmonids.
	Approach for monitoring effectiveness & enforcement:	Continuously evaluate reports from scientists.
	Funding secured for both action and monitoring programme?	Expected
Action A4-3:	**Description of action:**	In order to obtain an overview of the development of the pink salmon population and the spread of the species, good registration systems are needed. Information on the catch of pink salmon must be obtained from different registers. One is catch reports from the organized catch of pink salmon (the fish traps and other organized measures). Another is the catch reporting from fishermen. It is also important to include the catch of pink salmon in the sea.
	Planned timescale (include milestones	Catch reporting each pink salmon even and odd years

	where appropriate):	
	Expected outcome:	Obtain the best possible overview of the distribution and number of pink salmon in Norwegian waters
	Approach for monitoring effectiveness & enforcement:	Good systems must be established for reporting pink salmon, especially in areas with organized catches. In these areas, monitoring will also be carried out in the watercourses to see how much pink salmon have not been caught.
	Funding secured for both action and monitoring programme?	Yes