

Oslo, Norway, 2 May 2014

Letter of Concern from the undersigned organizations regarding the Norwegian government's failure to comply with the provisions of the Water Framework Directive 2000/60/EC (WFD) with regards to the biological effects of aquaculture

This is to inform the EFTA Surveillance Authority (ESA) that the Norwegian authorities fail to include biological effects of aquaculture in the implementation of the Water Framework Directive (WFD) in Norway. As a result, the magnitude of the biological effects of aquaculture is not reflected in the Norwegian WFD reports so far.

The biological effects of aquaculture include:

- The escape of farm fish, which is a problem since farmed fish are genetically less diverse than the wild stock of the same species and bred to grow fast in captivity. They also compete with the wild salmon for spawning areas.
- Increased infestation pressure from sealice, throughout the year, in areas with fish farms and spreading of sealice to new areas.
- Very nutrient rich organic waste, as well as pesticides and other pollutants.

These problems give rise to endless debates in Norwegian media and have sparked lots of research, funded by both the government and the aquaculture industry. Ever since the first planning cycle, with the voluntary RBMPs, there is also a discussion in Norwegian water management, from local to governmental level, about how to include (or according to the Directorate of Fisheries: whether to include) the biological effects of aquaculture in the WFD-work.

As the magnitude of the problem is well known and the effects of fish farming is a big concern for all those various groups and actors interested in the environmental health of Norwegian fjords and rivers, we think it is striking that for instance, the "[Summary report for Norway, WFD Article 5 Characterisation, Status May 2013](#)"ⁱ only mentions the problems with sea lice and escaped farmed fish in a footnote on page 19.

Biological effects of aquaculture still kept out of the WFD-implementation in Norway

To the knowledge of the NGOs represented in the National Advisory Group, there is still disagreement at Ministry level regarding how to include the effects of aquaculture in the implementation of the WFD.

The Norwegian Directorate of Fisheries demands that effects from aquaculture be kept out of the WFD work. They insist that there is not enough documentation that the claimed negative effects actually are caused by the fish farms, and that there is not enough objective research on what the effects are. This is despite reports like the investigation of aquaculture by the Office of the Auditor General of Norway "[Riksrevisjonens undersøkelse av havbruksforvaltningen, Dokument 3:9 \(2011–2012\)](#)"ⁱⁱ, which concludes that the farmed salmon industry have a negative impact on the environment. The Directorate of Fisheries (and the Ministry) has managed to keep effects of aquaculture out of the characterization of coastal waters, and thereby out of the River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs). Biological effects of aquaculture might therefore not be included in the RBMPs for 2016-2021. This is despite the clear message from the commission in the "[Commission staff working document, Norway, Accompanying the document Report from the commission to the European](#)

[Parliament and the Council on the Implementation of the Water Framework Directive, River Basin Management Plans](#)”,ⁱⁱⁱ dated 14 November 2012.

In chapter 4.4, the commission states that, *“Biological impact factors such as Gyrodactylus salaris infections, escaped farmed fish and alien species are also mentioned as important pressures in some Pilot RBMPs, but the Royal Decree clearly states that biological impact factors should not be included for coastal waters in the Pilot RBMPs or PoM. (...) Future RBMPs must encompass all significant pressures, including biological impact factors in coastal waters”*.

Keeping the effects of aquaculture out of the RBMPs for 2016-2021 is not in line with the [Royal Decree of 11 June 2010](#)^{iv}. In the chapter on coastal waters (*“Særlig om kystnære farvann”*), it is explained that the decision to keep biological impact factors out of the characterization of coastal waters, and thereby out of the RBMPs and PoMs, would only apply to the voluntary plans for 2010-2015. The Royal Decree of 2010 makes it clear that, where considered a significant pressure, it should be possible to include biological impact factors in coastal waters in the characterization and the RBMPs for the period 2016-2021. The Royal Decree further clarifies that measures against the impacts from aquaculture should be based on the Norwegian *“Strategy for an environmentally sustainable aquaculture”*^v, which focuses on escapes, nutrient releases, diseases and parasites (including sea lice) as the main environmental challenges today and in the near future. This national strategy document underlines that it will be especially relevant when developing environmental goals and measures for these topics in the RBMPs to be implemented in 2016-2021.

The intentions in the Royal Decree of 2010 are reflected in the Norwegian Authorities’ comments on the complaint from the commission as presented in the document *“Norges 15 forbedringspunkter, Faglig vurdering av tilbakemeldingen på Norges første vannforvaltningsplaner og relevante signaler fra EU-kommisjonens samlede gjennomgang, med anbefaling for oppfølging.”*^{vi}, from 18 June 2013.

In chapter 8, the Directorates behind this document comment on the remark from the commission, explaining that the Royal Decree from 2006 only concerned the voluntary areas included in the RBMPs for 2007-2009. The directorates point out that in the Royal Decree of 2010, it was decided that, where considered significant pressures, biological impact factors in coastal waters should be included in the characterization, and thereby included in the plans prepared up until 2015. Notice that this was written as late as June 2013, just over a year before the public hearing of the RBMPs for 2016-2021.

One major obstacle is the fact the authorities still have not developed environmental indicators or boundaries for what should be considered as acceptable environmental impact. In the report from 2012, the Office of the Auditor General of Norway wrote that it was important to define ruling indicators and to strengthen the monitoring and measurement tools, in order to meet the complex environmental challenges of the aquaculture industry. The Office of the Auditor General wrote that this would be necessary in order to reach sustainability and continued growth in the sector.

The authorities’ apparent inability to fulfil their own intentions in the Royal Decree of 2010 may partly be explained by the White Paper on Norwegian seafood policy ([Meld. St. 22 \(2012–2013\) Melding til Stortinget, Verdens fremste sjømatnasjon, Tilråding fra Fiskeri- og kystdepartementet 22. mars 2013](#))^{vii}, which on page 123 states that *“measures to reduce the environmental impact may have big consequences for the industry and public interests. Even if the goal is to have as little environmental impact from aquaculture as possible, one still has to consider the interests of the seafood industry and other associated public sectors before concluding on measures. Where the interests of the seafood industry and other associated public interests are considered more important than concerns for wild stock of anadromous salmonides, environmental measures may therefore be out of the question.”* (our translation)

In our contact with the RBDs and sub-districts, we also keep hearing about the obstacles experienced by the competent authorities of the RBDs, and sub-districts. A common explanation, when local NGOs

question why there are no proposals for measures in water bodies that are known to be infected with sea lice or where there is a big percentage of escaped farm fish, is that the competent authorities of the RBDs experience either neglect or direct unwillingness to cooperate from the national and regional offices of the Directorate of Fisheries.

This has even led to a letter dated 15 July 2013 from the (then) Ministry of Environment, in consultation with the (then) Ministry of Fisheries and Coastal Affairs, about the need for improved cooperation between the environmental and fisheries-/ coastal authorities ("[Samarbeidet mellom miljøvernmyndighetene og fiskeri- og kystmyndighetene når det gjelder vannforvaltningsplanarbeid](#)")^{viii}. In the letter, the Ministry underlines the very basics of what is expected from the environmental agencies and the fisheries- and coastal authorities in terms of co-operation with regards to the RBDPs and implementation of the WFD.

The last bullet point on page 2, second last sentence, informs the agencies that when there is disagreement (between the environmental and fishery agencies), the impact level from sea lice and escaped farm fish should be set as "unknown" and the environmental status and risk assessment be set as "undefined" in the Norwegian water information system, Vann-nett.

From a WFD point of view, environmental measures should be implemented where the environmental status is moderate or worse, or where there is a risk that the status may deteriorate.

The problem with keeping the biological effects of aquaculture out of the classification work and out of the water information system Vann-nett, is that all environmental measures in the PoMs are based on the environmental status registrations in Vann-nett. If a problem is not registered there, it so to speak "does not exist" in the water management work within the river basin districts.

As the aquaculture industry is carrying out certain mitigating measures already, it is odd that the authorities fight hard to keep the effects of aquaculture out of the WFD implementation in Norway.

The authorities and aquaculture industry recognize the problems

The Norwegian government and the aquaculture sector itself has financed lots of research on the biological effects of aquaculture, and also on what mitigating measures the industry may use in handling these problems. This has resulted in several research and monitoring reports that describe the problems with sea lice in several areas and the genetic pollution of wild salmon stocks, especially. To mention a few, these reports include:

- Vollset et al. 2014. [Salmon lice increase the age of returning Atlantic salmon](#), in Biology Letters, 29 Jan 2014. (researchers from the Norwegian Institute of Marine Research and Uni Research.)^{ix}
- Fiske, P. 2013. [Surveillance of escaped farmed salmon in rivers in the autumn 2010 – 2012](#), NINA report 989. (Norwegian Institute for Nature Research)^x
- Taranger et al 2014. [Risk assessment of Norwegian aquaculture 2013](#), in "Fisken og havet, særnummer 2-2014" (Norwegian Institute of Marine Research)^{xi}

When the Institute of Marine Research published the risk assessment for 2013 (last example above), they summed it up by saying that [salmon lice and escaped farm fish are the biggest problems](#).^{xii}

On 26 March 2014, the Norwegian Food Safety Authority published, on its webpages, the results from a study made by the Norwegian Veterinary Institute, published in the report "[The surveillance programme for resistance to chemotherapeutants in *L. salmonis* in Norway 2013](#)"^{xiii}. The study from the Veterinary Institute showed that salmon lice *L. salmonis* in Norwegian salmon farms are becoming increasingly resistant against the available drugs. Out of the ten counties in Norway with salmon farms, it was only one, Finnmark County, in which the salmon louse did not show resistance to the available chemotherapeutants. [In a comment on the report](#)^{xiv}, Kristina Landsverk, Director of the

Department of Controls at the Norwegian Food Safety Authority, says that the results confirm the serious situation of the pest management programme for salmon lice.

It is obvious that an increased amount of lice in the fish farms will have a severe effect on the populations of wild salmonids in Norwegian coastal waters. As shown in recent publications such as the above mentioned one by Volleset et al., sea lice infections cause severe problems for the host even in cases where the infection is not directly lethal. Changes in the behavioral pattern and reduced survival and reproduction rates pose a great threat to the populations of wild salmonids. An increase in infestation rate, caused by increased resistance to chemotherapeutants in *L. salmonis*, could be detrimental to many local river populations of salmonids in Norway.

At the same time, the The Norwegian Climate and Pollution Agency, now part of the Norwegian Environment Agency, has [expressed concern regarding the environmental effects of two types of drugs, diflubenzuron and teflubenzuron, used in the pest management of sea lice](#).^{xv} This will also have implications with regards to the implementation of the WFD. One of the studies that lead to these worries is the report "[Flubenzuroner i fiskeoppdrett - miljøaspekter og restkonsentrasjoner i behandlet fisk](#)"^{xvi}, from January 2013, by researchers from the Norwegian Institute of Marine Research and the National Institute of Nutrition and Seafood Research.

For some fish farms, in unsuitable locations or where the companies have been given licenses to grow bigger than the carrying capacity of the recipient, there are also problems of eutrophication. Again, the Directorate of Fisheries claims there is not enough research on the links between nutrient releases from aquaculture and environmental impact in the water bodies to include this in the WFD work.

The Office of the Auditor General of Norway, states in its report on the investigations of the aquaculture management, "[Riksrevisjonens undersøkelse av havbruksforvaltningen, Dokument 3:9 \(2011–2012\)](#)"^{xvii}, that the current MOM-methods are insufficient and poorly adapted to today's fish farms. As an example, here is a quote (translated by us) from the document, with analyses of proposed environmental measures in the sub-district Sunnhordaland in RBD Hordaland (page 16):
"When beginning to work with the WFD in sub-district Sunnhordaland, one could foresee that there would be quite some emphasis on the environmental effects of aquaculture. This was more or less put on hold when the government stopped the work with characterizations considering sealice and escaped fish, awaiting guidelines from the ministries. The environmental impact of sealice and escaped fish was set as "unknown" in "vann-nett", and environmental status and risk assessment was set as "undefined". (...) There are 80 seafood fish farms and 18 fish hatcheries in sub-district Sunnhordaland."

On the website of the Norwegian Ministry of Climate and Environment, the ministry presents the Norwegian Official Report on reasons for the decline in the wild salmon stock, «[NOU 1999: 9, Til laks åt alle kan ingen gjera?, Om årsaker til nedgangen i de norske villaksbestandene og forslag til strategier og tiltak for å bedre situasjonen](#)»^{xviii}.

In the English sum up, the ministry writes: *"Due to the growth of aquaculture, the salmon louse has hosts in coastal waters year-round. Adult salmon and smolt have increased the incidence of lice infestations in areas with considerable fish farming, and salmon lice are probably a significant cause of mortality in migrating smolt."*

Other points from the report (our translation):

- Registrations show that the worst infections on wild fish are concentrated to areas with intense aquaculture,
- It is probable that the contribution of salmon louse larvae is bigger from farmed fish than from wild fish
- Farmed fish may cause greater lice infections rates as they are heavily infected with sea lice winters and summers.

- It is a consistent problem that there is no systematic monitoring of sea lice on wild salmonids in Norway, why there is little knowledge on the actual development of the salmon louse population.

The aquaculture industry itself is highly aware of these problems. On the topic of escapes the Norwegian Seafood Federation, has made the following statement on their website^{xi} (our translation):

- The efforts to prevent escapes continue. Statistics from The Directorate of Fisheries on escapes show that almost 200 000 salmon escaped from Norwegian fish farms in 2013. – This increase from 2012 is not good. The industry needs to learn from those who are successful with implementing mitigating measures, says Tarald Sivertsen, chair of The Norwegian Seafood Federation’s Escapes Commission.

The problems are of such magnitude that Marine Harvest, one of the biggest aquaculture companies in Norway, in their response to the governments’ proposal on how to make the licensing regulations more flexible, point to the problem of sealice. They write that the situation today, when it comes to the effects of sealice on the wild population and the spreading of diseases between fish farms, is so severe that the Norwegian aquaculture industry is not ready to grow as much as outlined in the proposal.^x

In conclusion, the industry invests massively in measures against problems, partly due to legal obligations, which the Directorate of Fisheries in the context of the Water Framework Directive claim do not exist.

Public debate about the effects of aquaculture

We would like to inform ESA that the debate about the effects of aquaculture is a hot and never-ending story in Norwegian media. Norwegian anglers and various groups with interest in rivers with anadrome fish (whether land owners, tourist businesses or environmental NGOs) are outraged over the authorities inability to deal with the problems. To a large extent, both the industry and the Norwegian government publicly recognize that these issues need to be handled.

Short description on the situation in Norway

Escapes

According to the official numbers on reported escapes presented by Directorate of Fisheries^{xi}, the number of escapees from salmon farms reached 370 000 in 2011. In the two worst years, 2006 and 2005, the number of escaped salmon reached 921 000 and 717 000 respectively.

In comparison, about 420 000 wild salmon return to the Norwegian coast each year. There are big variations in the ratio of spawning salmon with wild origin vs escaped farm fish.

The percentage of escaped salmon in the spawning population varies from over 75 % in Hordaland to 5-10 % in Finnmark^{xii}. Most regions have 10-25 % escaped salmon in the spawning population. These fish pose a great genetic risk for the gene-pool of the almost 400 indigenous wild salmon populations.

There are about 350-400 million salmon at any given time in Norwegian fish farms today, which is almost 1000 times as many as the number of wild salmon. This explains why an “acceptable loss” for the aquaculture industry will still pose an enormous threat to the wild stock.

The total numbers of escaped farm fish for the last five years, also including trout, cod and other species, are 253 000 in 2013, 228 000 in 2012, 379 000 in 2011, 463 000 in 2010, 580 000 in 2009. For the two worst years the total number of escapes are 1 226 000 in 2006 and 938 000 in 2005.

Salmon louse

As you may know, the salmon louse feeds of the skin of salmon and can cause serious skin wounds and fin damage. Open wounds can create a pathway for pathogens. Adult salmon or trout can be infested

with a few lice without suffering severe damage, even though the growth rate may decline and the migratory pattern may be altered, while just a couple of lice on a juvenile salmon can be harmful or fatal. Sea lice may also carry diseases between farmed and wild salmon.

The salmon louse threatens the wild salmon along the coastline from Rogaland to Nordland. In areas with high lice infection rates, the wild salmon stock may go extinct, and for sea trout *Salmo trutta*, the anadromous trout that migrates between salt and fresh water, the population is already reduced to just a few percent of the original size. In the Hardangerfjord, which has the highest concentration of fish farms in Norway, all salmon populations are threatened with genetic extinction due to salmon lice, and the sea trout population is heavily reduced.^{xxiii} There are also alarming reports of salmon louse on wild fish in other areas, including in the Trøndelag region, which is the most important area for Norwegian wild salmon.

Rising sea water temperatures in northern areas will bring the salmon louse further north, and thereby threaten the sea-run Arctic char *Salvelinus alpinus* as well as salmon and sea trout.

Organic and inorganic waste

In addition to the problems with genetic pollution (escapes) and sea lice, we also want to bring your attention to the enormous amounts of biogenic waste (fish faeces, undigested food and other forms of discharge, including solid and dissolved nutrients) generated in fish farming. Based on numbers from the Norwegian Environment Agency the nutrient release from Norwegian fish farms is equivalent to that from 10 million people. That is twice the Norwegian population! It is obvious that the Norwegian municipalities, responsible for running wastewater treatment plants with enough capacity for all inhabitants, and the agricultural sector, with increasing demands on reducing nutrient leakage, would never get away with these numbers and doing nothing about it.

The fish farms also leak lots of copper, from treatment against biofouling. According to estimates by the Norwegian Environment Agency 80-90 % of the copper in the repellents is lost to the surrounding water^{xxiv}.

The above information shows the magnitude of the challenges connected with aquaculture and the implementation of the WFD in Norway. We, the undersigned organisations, sincerely hope that ESA will demand that the Norwegian government incorporates the biological effects of aquaculture in the Norwegian implementation of the WFD.

Yours sincerely,

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