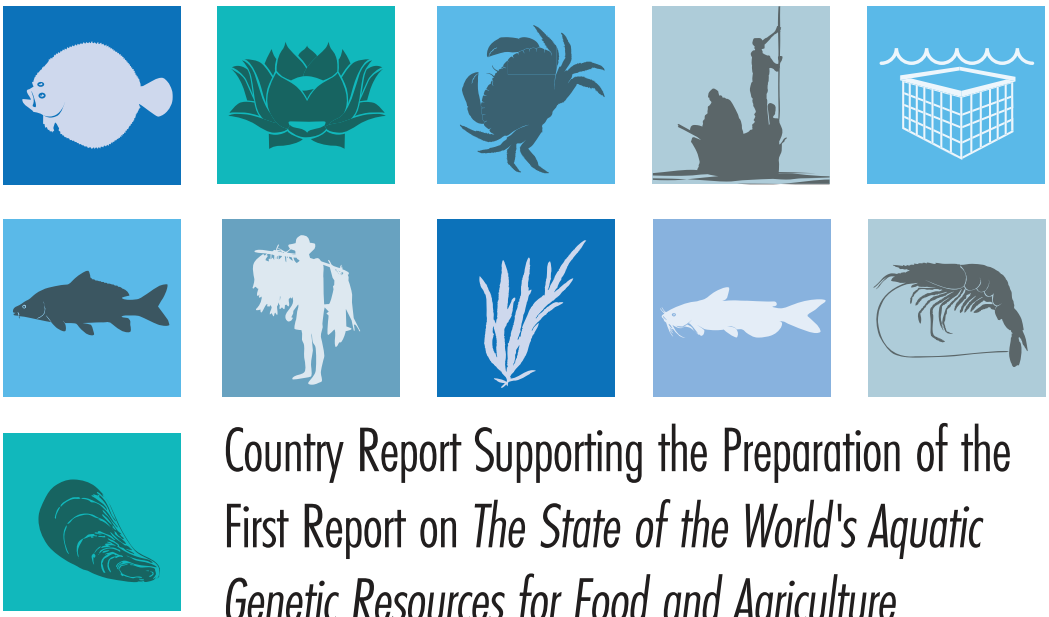
Food and Agriculture Organization of the United Nations

COUNTRY REPORTS

Norway



Country Report Supporting the Preparation of the First Report on *The State of the World's Aquatic Genetic Resources for Food and Agriculture*

Food and Agriculture Organization of the United Nations

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Questionnaire for the Preparation of Country Reports for *the First State of the World's Aquatic Genetic Resources for Food and Agriculture*

COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

INSTRUCTIONS FOR COMPLETING THE DYNAMIC GUIDELINES

How do I complete the dynamic guidelines?

1. You will require Adobe Reader to open the dynamic guidelines. Adobe Reader can be downloaded free of charge from: http://get.adobe.com/uk/reader/otherversions/. Use Adobe Reader Version 10 or higher.
2. Open the dynamic guidelines and save it (save as a pdf) on your hard drive.
3. Please rename it <name of your country>.pdf.
4. You may forward the dynamic guidelines to stakeholders you would like to involve or inform by e-mail. You may also print and/or save the dynamic guidelines.
5. It is advisable to prepare textual responses (including any formatting such as bullet points) first in a separate document and then to copy and paste them into the form. Please use font Arial 10. Acronyms and abbreviations should be avoided if possible. If included, they must be introduced (i.e. written out in full) the first time they are used. Note that the text boxes are expandable. Once text has been entered, the box will automatically enlarge to make its content fully visible when you click outside its border. To delete a row you have added, click on the "X" on the far right of the table
6. When you have finished completing the dynamic guidelines, click the "Submit form" button at the end of the form and send the completed dynamic guidelines to Devin.Bartely@fao.org; Matthias.Halwart@fao.org; and ruth.garciagomez@fao.org.
7. This should automatically attach the document to an email that you can then send. Otherwise, please attach the completed dynamic guidelines manually to an e-mail and send it to Devin.Bartely@fao.org; Matthias.Halwart@fao.org; and ruth.garciagomez@fao.org.
8. A letter confirming official endorsement by relevant authorities should also be attached to the email.
9. You will receive a confirmation that the submission was successful.

Where can I get further assistance?
If you have any questions regarding the dynamic guidelines, please contact
Devin.Bartely@fao.org; Matthias.Halwart@fao.org; ruth.garciagomez@fao.org

Several websites provide useful information on aquatic species that can be consulted for proper species names and for information on aquatic genetic resources: AlgaeBase, Aquamaps, Barcode of Life, Census of Marine Life, FishBase, Frozen Ark, GenBank, Global Biodiversity Information Facility, International Union for Conservation of Nature, National Institutes of Health Database on Genomes and Bioinformatics, Ornamental Fish International, SealifeBase, Sea Around Us, and World Register of Marine Species.

How, by whom and by when must the completed dynamic guidelines be submitted?
Once officially endorsed by the relevant authorities, the completed dynamic guidelines should be submitted (click the "Submit form" button on the header banner) by the National Focal Point. **Completed dynamic guidelines should be sent by December 31st 2015.**

www.algaebase.org
www.aquamaps.org
www.barcodeoflife.org
www.coml.org
www.fishbase.org
www.frozenark.org
www.genbank.org
www.gbif.org
www.iucn.org
http://discover.nci.nih.gov/
www.ornamental-fish-int.org
www.sealifebase.org
www.seaaroundus.org
www.marinespecies.org

I. INTRODUCTION

At its Thirteenth Regular Session, the Commission noted that the preparation of a country-driven *State of the World's Aquatic Genetic Resources for Food and Agriculture* would provide countries with opportunities for assessing the status of their aquatic genetic resources for food and agriculture and enhancing the contributions of aquatic genetic resources to food security and rural development. Additionally the process of producing Country Reports will assist countries in determining their needs and priorities for the conservation and sustainable use of aquatic genetic resources for food and agriculture, and will help raise awareness among policy-makers.

II. COUNTRY REPORTS

As with the other sectors, *The State of the World's Aquatic Genetic Resources for Food and Agriculture (SoWAqGR)* will be compiled from Country Reports. It is recognized that guidance is necessary in order to assist countries in completing those reports under a common framework. The Country Reports will become official government documents submitted to FAO.

The following questionnaire is the suggested format for the preparation and submission of Country Reports. The questionnaire has been prepared by FAO to assist in the preparation of Country Reports contributing to the SoWAqGR Report. It has been designed to assist countries to undertake a strategic assessment of their aquatic genetic resources for food and agriculture.

The scope of the first State of the World's Aquatic Genetic Resources for Food and Agriculture, and therefore the emphasis in the Country Reports, is farmed aquatic species and their wild relatives within national jurisdiction.

Country Reports should:

- become powerful tools for improving the conservation, sustainable use and development of aquatic genetic resources for food and agriculture, at national and regional levels;
- identify threats to aquatic genetic resources, gaps in information about aquatic genetic resources and needs for the strengthening of national capacity to manage aquatic genetic resources effectively;
- inform the development of national policies, legislation, research and development, education, training and extension concerning the conservation, sustainable use and development of aquatic genetic resources for food and agriculture;
- contribute to raising public awareness about the importance of aquatic genetic resources for food and agriculture;
- complement other national reporting activities on the conservation, sustainable use and development of aquatic genetic resources.

Timeline and process

In line with the overall process, as established by the Commission, the Director-General of FAO sent a Circular State Letter on 19 April 2012 to countries requesting them to identify National Focal Points for the preparation of Country Reports by 31 December, 2015.

The following steps are recommended in preparing the Country Report, using a participatory approach:

- Each participating country should appoint a National Focal Point for the coordination of the preparation of the Country Report who will also act as focal point to FAO. National Focal Points should be communicated to the Secretary, Commission on Genetic Resources for Food and Agriculture (cgrfa@fao.org) immediatly.
- Countries are encouraged to establish a national committee to oversee the preparation of the Country Report. The national committee should consist of as many representative stakeholders as practical (representing government, industry, research and civil society).
- The national committee should meet frequently to review progress and consult widely with key stakeholders.

- The National Focal Point should coordinate the preparation of the first draft of the Country Report, which should be reviewed by the national committee. The National Focal Point should facilitate a consultative process for broader stakeholder review.
- Following the stakeholder review, the National Focal Point should coordinate the finalization of the Country Report, submit it to the government for official endorsement and transmit it to FAO in one of the Organization's official languages (Arabic, Chinese, English, French, Russian and Spanish) by 31 December 2015.
- The Country Report will be an official government report.
- If countries are unable to submit final Country Reports by the set deadline, preliminary reports of findings should be provided to FAO to contribute to the identification of global priorities for inclusion in the SoWAqGR Report.

QUESTIONNAIRE FOR PREPARATION OF COUNTRY REPORTS FOR *THE STATE OF THE WORLD'S AQUATIC GENETIC RESOURCES FOR FOOD AND AGRICULTURE*

Country report supporting the preparation of

The State of the World's Aquatic Genetic Resources for Food and Agriculture

Country	Norway
Prepared By	
Date	May 21, 2016

TABLE OF CONTENTS

		Page
I.EXECUTIVE SUMMARY		6
II.INTRODUCTION		6
III.MAIN BODY OF THE COUNTRY REPORT		6
Chapter 1.	The Use and Exchange of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction	6
Chapter 2.	Drivers and Trends in Aquaculture: Consequences for Aquatic Genetic Resources within National Jurisdiction	42
Chapter 3.	*In Situ* Conservation of Aquatic Genetic Resources of Farmed Aquatic Species and their wild Relatives within National Jurisdiction	52
Chapter 4.	*Ex Situ* Conservation of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction	59
Chapter 5.	Stakeholders with Interests in Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction	64
Chapter 6.	National Policies and Legislation for Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction	71
Chapter 7.	Research, Education, Training and Extension on Aquatic Genetic Resources within National Jurisdiction: Coordination, Networking and Information	93
Chapter 8.	International Collaboration on Aquatic Genetic Resources of Farmed Aquatic Species and Their Wild Relatives	111

I. EXECUTIVE SUMMARY

The Country Report should contain an executive summary of 2-3 pages highlighting the main findings of the analysis and providing an overview of key issues, constraints and existing capacity to address the issues and challenges. The executive summary should indicate trends and driving forces and present an overview of the proposed strategic directions for future actions aimed at the national, regional and global levels.

Please include the Executive Summary here.

II. INTRODUCTION

The main objective of the Introduction is to present an overview that will allow a person who is unfamiliar with the country to appreciate the context for the Country Report. The Introduction should present a broad overview and present background information from your country on farmed aquatic species, their wild relatives and culture based fisheries. Detailed information should be provided in the main body of the Country Report. Countries may wish to consider developing their Introductions after completing the main body of their Country Reports.

Please write the overview here

Since the advent of commercial salmon farming around 1970, the aquaculture industry has grown to become an industry of major importance. Not just to the Norwegian economy at large, but especially to the many communities found along the coast where other economic opportunities are sometimes limited. Today, farming of salmon and rainbow trout is taking place in close to 160 municipalities all along the Norwegian coast, from Lillesand in the south to South-Varanger in the north. An environmentally sustainable aquaculture industry, minimizing risks to the marine environment and biological diversity, is a prerequisite for long-term growth and development.

The last 40 years have seen substantial growth in the Norwegian salmon farming industry. Atlantic salmon (Salmo salar) is the dominant species, but other salmonids like Rainbow trout, Brown trout and Norwegian Arctic char are also produced. During the last decades there have been several attempts to engage in cod farming in Norway, with varying success. Halibut farming started in the beginning of the 1980s, but difficulties with fry production gave the industry a difficult start. Today there is a small commercial production of halibut in Norway. Seaweed production is increasing. Ranching of Norwegian lobster in saltwater and cultivation of salmonids in freshwater is a preventive measure to keep fisheries and populations viable.

III. MAIN BODY OF THE COUNTRY REPORT

Aquaculture, culture-based fisheries and capture fisheries, have differing importance among countries. The structure of chapters in each Country Report will reflect those differences. Countries which do not have a well-developed aquaculture sector but where wild relatives of farmed aquatic species are located, should report on these resources. Countries should decide how to prioritize the coverage of their Country Reports depending on their aquatic genetic resources.

Chapter 1: The Use and Exchange of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction

The main objective of Chapter 1 is to provide annotated inventories of aquatic genetic resources (AqGR) of farmed aquatic species and their wild relatives.

Farmed aquatic species

1. Over the last 10 years, has production been: ***Please mark appropriate box.***

- ◉ Increasing
- ◯ Stable
- ◯ Decreasing
- ◯ Stopped
- ◯ Still in Research and Development
- ◯ Fluctuating
- ◯ Not known

2. What is the expected trend over the next 10 years? ***Please mark appropriate box.***

- (●) Increasing
- ( ) Stable
- ( ) Decreasing
- ( ) Stopped
- ( ) Still in Research and Development
- ( ) Fluctuating
- ( ) Not known

3. Is the identification and naming of farmed species, subspecies, hybrids, crossbreeds, strains, triploids, other distinct types accurate and up- to-date? ***Please mark appropriate box.***

- (●) Yes
- ( ) No
- ( ) Mostly Yes
- ( ) Mostly No

Please include any explanation or additional information here.

4. To what extent are genetic data for farmed aquatic organisms

a) Available? ***Please mark appropriate box.***

- ( ) Not at all
- ( ) To a minor extent
- (●) To some extent
- ( ) To a great extent

b) Used in management? ***Please mark appropriate box.***

- ( ) Not at all
- ( ) To a minor extent
- ( ) To some extent
- (●) To a great extent

Please add any explanation here.

QTL IPN in Rainbowtrout and salmon. + QTL of different traits (RED, PD, GREEN TRACK) in salmonids.

5. To what extent are the aquatic organisms farmed in your country sourced as wild seed or from wild brood stock*?*

Please mark appropriate box.

- ○ Not at all
- ○ To a minor extent
- ◉ To some extent
- ○ To a great extent

Please add any explanation here.

Lumpsucker and wrasse have just recently started traditional breeding programs and brood stock have been sampled from the wild. Farmed Atlantic salmon in Norway originate from wild populations.

6. What proportions (%) of breeding programmes and efforts for the genetic improvement of farmed aquatic species in your country are being managed by the public sector (government research, universities etc.), the private sector, and public-private partnerships?

• Percent managed by public sector.	**Please Enter Percentage Here**	2
• Percent managed by private sector.	**Please Enter Percentage Here**	95
• Percent managed by private /public partnership.	**Please Enter Percentage Here**	3
	Total	100

Please add any explanation here.

Breeding work in Norwegian aquaculture is undertaken almost exclusively by private breeders. Only to a very small extent is breeding work done in public facilities (Norwegian cod breeding program in Tromsø) and in partnerships (Nofima).

7. To what extent do genetically improved aquatic organisms, including hybrids, crossbreeds, strains, triploids and other distinct types contribute to national aquaculture production in terms of volume ?

Please mark appropriate box.

- ○ Not at all
- ○ To a minor extent
- ◉ To some extent
- ○ To a great extent

8. Please list most significant examples where genetic improvement contributed to increased production and indicate whether they were developed by public, private or public/private partnerships.

Add Row

Species	Type of genetic improvement *mark all that apply*	Developed By *mark all that apply*	
	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Salmo salar	☒ Triploids and other polyploids	☒ Private Sector ☒ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Salvelinus alpinus	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	

	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Salmo trutta	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☒ Traditional selective breeding	☒ Private Sector ☒ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Gadus morhua	☒ Triploids and other polyploids	☐ Private Sector ☒ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	

	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Hippoglossus hippoglossus	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Oncorhynchus mykiss	☒ Triploids and other polyploids	☒ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	

	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Psetta maxima	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Labrus bergylta	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	

	☒ Traditional selective breeding	☒ Private Sector ☐ Public Sector ☒ Private/Public partnership	
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Cyclopterus lumpus	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	

9. Please fill in table 1.1

Table 1.1 Aquatic genetic resources (AqGR) of farmed aquatic species in your country

Add Row

Farmed species	Genetic type	Availability of genetic data	Trends in production	Future trends in production	Genetic improvement	Future genetic improvement	Comments	
List species (scientific names), strains and varieties as scientific names (put in brackets the most widely used national common name or names) and indicate whether native or introduced	*Indicate all genetic types that apply to the species*	Are genetic data available for farmed populations? If yes, give summary details in comments	Over the last 10 years, production has been ***(mark one)***	Expected trend over the next 10 years is that production will ***(mark one)***	Which genetic technologies are currently being used on the species ***(mark all that apply)***	***mark all that apply***	For example important traits improved, how data are used in management or name of breed, source of information, etc.	
◉ Native ○ Introduced Salmo salar	☐ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☒ Polyploids	◉ Yes ○ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☒ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)		X

◉ Native ○ Introduced Salmo trutta	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☒ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)		X
◉ Native ○ Introduced Salvelinus alpinus	☐ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☒ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)		X

○ Native ◉ Introduced Oncorhynchus mykiss	☐ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☒ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)		X
◉ Native ○ Introduced Cyclopterus lumpus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ◉ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)	Lumpsucker is getting increasingly popular as it is used as a cleaner fish in the salmon industry.	X

◉ Native ○ Introduced Labrus bergylta	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ◉ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)		X
◉ Native ○ Introduced Gadus morhua	☐ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	◉ Yes ○ No ○ Not Known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Stopped ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☐ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☐ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)	National Norwegian breeding station in Tromsø and a few other companies were registrated in 2014. Numbers for 2015 will com 2. of june.	X

◉ Native ○ Introduced Psetta maxima	☐ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Only a few companies that breed and sell Turbot.	X
◉ Native ○ Introduced Hippoglossus hippoglossus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	◉ Yes ○ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ◉ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☐ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Only a few companies that breed and sell Halibut	X

◉ Native ○ Introduced Nephrops norvegicus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	◉ Yes ○ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Norwegian cancer spesies	X
◉ Native ○ Introduced Homarus gammarus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Lobster uses primarily for sea ranching.	X

○ Native ◉ Introduced Homarus americanus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	American Lobster is seen as an invasive species.	X
◉ Native ○ Introduced Astacus astacus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ◉ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)		X

◉ Native ○ Introduced Ostrea edulis	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)		X
○ Native ◉ Introduced Pecten maximus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☒ Polyploids	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☒ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)		X

○ Native ◉ Introduced Mytilus edulis	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Stopped ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)		X
◉ Native ○ Introduced Strongylocentrotus droebachiensis	☒ Wild Type ☐ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ◉ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ◉ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Sea urchin	X

10. Which aquatic species in your country are thought to have potential for domestication and future use in aquaculture?

Add Row

Species ***Type and select a species***	Is the species native to your country?	Comments ***For example main sources of information***	
Labrus bergylta	(●) Yes ( ) No ( ) Not Known	thought to be part of the solution with the challanges Norway experiences with sea lice.	X
Cyclopterus lumpus	(●) Yes ( ) No ( ) Not Known	Lumpsucker is thought to be part of the solution with the challanges Norway experiences with sea lice	X
Algae	(●) Yes ( ) No ( ) Not Known	The last few years we have seen an increased interest for seaweed aquaculture in Norway. The government have granted licenses for around 30 sites for seaweed aquaculture to 18 different companies. Seaweeds can be a refined into a wide range of products and applications, such as human consumption, fish and animal feed, pharmaceuticals, biochemicals, bioenergy and more. Several farmers also investigates the possible positive effect of producing seaweed close to fish farms, resulting in faster growth and a "reuse" of excess nutrients from the production of fish.	X

Hippoglossus hippoglossus	(●) Yes ( ) No ( ) Not Known	Norway is part of an EU project called Diversify that started in December 2013. The project aims to identify fish species with potential for European aquaculture. Norway is in this context studying the possibilities to solve bottlenecks in the production of Halibut.	X

11. Please list the aquatic genetic resources of farmed aquatic species your country has transferred or exchanged with other countries over the past 10 years.

Add Row

Species	Genetic alteration of exchanged material **Mark all that apply**	Details of transfer or exchange	Type of genetic material exchanged **Mark all that apply**	Country or countries involved with exchange **Hold CTRL button to select more than one country**	Comments ***Please add main purpose or objective of the exchange and main sources of information***	
	☐ No deliberate genetic alteration ☐ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☐ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☐ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus Belgium		X

Wild relatives of farmed aquatic species

12. Please list any wild relatives of aquatic species present in your country that are farmed in another country (but not in your country) and indicate their uses.

Add Row

This question refers to aquatic genetic resources that are present in the wild in your country and that are being farmed elsewhere (but not farmed in your country), indicating any uses these resources may have in your country.

Species	Use *(mark all that apply)*	Comments	
	☐ Capture fisheries ☐ Recreational fishery ☐ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X

13. Please list the aquatic genetic resources of wild relatives of farmed aquatic species your country has transferred or exchanged with other countries over the past 10 years.

Add Row

This question refers to wild aquatic genetic resources collected from the wild, not from farming facilities as in question 11.

Species	Details of transfer or exchange ***mark all that apply***	Type of genetic material exchanged	Country **Hold CTRL button to select more than one country**	Comments ***main sources of information, if the transfer was legal or not***	
	☐ Import ☐ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☐ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus		X

14. Please fill in table 1.2

Table 1.2 Aquatic genetic resources of wild relatives of farmed aquatic species in your country.

Add Row

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
For each row, list the species as scientific names (put in brackets the most widely used national common For each species, include the named stocks and name of other management units if known)	Is the species ***(mark as appropriate):***	Is this species targeted by capture fisheries?	Are there any management measures in place?	Are genetic data available for the fishery?	Are genetic data used in management?	Over the last 10 years, catches have been:	Expected trend over the next 10 years.	Indicate the ecosystem where the fishery is located (***mark all that apply)***	The habitat or range is	What are likely reasons for changes? (***mark all that apply)***	
Salmo salar	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☐ Coastal in EEZ ☐ High seas ☒ Lake ☐ Reservoir ☒ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Salmo trutta	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☐ Coastal in EEZ ☐ High seas ☒ Lake ☐ Reservoir ☒ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Hippoglossus hippoglossus	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Psetta maxima	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Reinhardtius hippoglossoides	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Gadus morhua	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Pollachius virens	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Melanogrammus aeglefinus	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Brosme brosme	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☒ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Molva molva	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Molva dypterygia	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	○ Yes ◉ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)** redlisted, only by-catch fishing	○ Increasing ○ Stable ○ Decreasing ◉ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Pollachius pollachius	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Merluccius merluccius	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Merlangius merlangus	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ◉ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)** med trål og snurrevad	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Cyclopterus lumpus	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ◉ Not known	☒ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ○ Stable ○ Decreasing ◉ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Glyptocephalus cynoglossus	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Limanda limanda	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Solea solea	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Pleuronectes platessa	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ◉ Not known	☐ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ○ Stable ○ Decreasing ◉ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Microstomus kitt	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	○ Yes ◉ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)** as by-catch	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Scophthalmus rhombus	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	○ Yes ◉ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)** as by-catch	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Nephrops norvegicus	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Pandalus borealis	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ◉ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ○ Stable ○ Decreasing ◉ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Paralithodes camtschaticus	☒ Straddling ☒ Transboundary ☒ Introduced ☐ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☒ Coastal in EEZ ☒ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	◉ Increasing ○ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☒ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X

Chapter 2: Drivers and Trends in Aquaculture: Consequences for Aquatic Genetic Resources within National Jurisdiction

The main objective of Chapter 2 is to review the main drivers and trends that are shaping aquaculture and their consequences for aquatic genetic resources.

15. Please indicate the ways the aquatic genetic resources (AqGR) of **farmed aquatic species** have been impacted by the following drivers. Please give examples of positive and negative impacts for specific drivers.

This question refers to drivers impacting farmed aquatic genetic resources, not about impacts on the entire aquaculture sector. Drivers should be seen from a national perspective.

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Human population increase	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	Norway have a long coast with about 5 mill people. We have not had a strong enough population increase to have an effect on AqGr. An international an increase in population have had a positive impact on Norwegian AqGr. Not only is the population in total growing, but the middle class is increasing. An increase of the middleclass means more people buy Norwegian salmon and whitefish.
Increased wealth and demand for fish	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	people can afford to satisfy the demand for fish and seafood through in-country production. Norwegian Seafood Council is marketing salmonids and whitefish from Norway to all parts of the world. There is an increasing middleclass in the world who is buying both salmon and other fish.
Governance (ability of government, industry and the public to work together in managing resources)	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	In Norway, adequate state governance to conserve and ensure the sustainable development of AqGR produced through aquaculture is a separate policy and legal area. Aquaculture is subject to the regulations through the Aquaculture Act, Animal Welfare Act and Food Safety Act and its regulations. Environmental and nature protection as well as consumer protection policy is very strong in Norway. In the limnic segment, the AqGR are particularly affected by the regulations governing water management. In Norway it is the Ministry of Trade, Industry and Fisheries that have the overall responsible for Aquaculture. The Ministry of Trade, Industry and Fisheries have an agency, the directorate of fisheries and the food safety authorities, that help monitor and give out permits to the Norwegian aquaculture industry.
Climate change	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	If the water temperatures continues to rise there are some areas in Norway that may not be suitable for aquaculture of Atlantic salmon anymore. However this may open farming of new species in Norway and in this way increase total food production.

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Competition for resources, especially freshwater	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	The competition with other sectors such as nature conservation, environmental pro-tection, water management and the leisure industry, is very strong in Norway. Freshwater resourses are limited in many places and so is the space for building. As the number of RAS are increasing the need for freshwater will be less. The industry primarily uses freshwater to produce salmon smolts.
Changes in values and ethics of consumers	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	Norwegian aquaculture have spent a lot of money on reaching as many consumers as possible with information concerning animal welfare and the avoidance of the use of pharmaceuticals. This has been a topic for discussion and reaches many consumers on an emotional and moral level. The National Institute of Nutrition and Seafood Research (NIFES) conducts research on seafood. The institute studies fish nutrition and the effects of fish and seafood consumption on health.
Other ***Add other drivers as necessary*** Add Row / Remove Row	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	

16. Please indicate the ways the aquatic genetic resources of **wild relatives of farmed aquatic species** in nature have been impacted by the following drivers. Please give examples of positive and negative impacts for specific drivers.

This question refers to drivers impacting wild aquatic genetic resources of farmed species, not about impacts on the entire aquaculture sector. Drivers should be seen from a national perspective.

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Human population increase	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	To date, human population increase has had unknown effects on the wild AqGR occurring in nature.
Increased wealth and demand for fish	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	The awareness and understanding of fishing as a particularly sustainable form of utilisation of natural resources is part of Norwegian culture in large sections of the population. AqGR are seen from the aspect of conservation as well as the aspect of utilisation. As people have more money they get more and more conscious on what they eat and can set higher demands to how the fish is treated.
Governance (ability of government, industry and the public to work together in managing resources)	◉ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	As the legislative responsibility for the legal regulation of the use of AqGR in the fields of fisheries lies with Ministry of Trade, Industry and Fisheries in Norway. The directorate of fisheries have to provide professional input to the policy making process by way of analyses, statistics and advice, legislature and regulative work and regulation planning development. They have to to be an efficient manager by implementing political decisions, processing applications and appeals and conducting monitoring and control. The directorate of fisheries have to be a partner through active cooperation with trade and industry, the research community and other public services and knowledge sharing with various stakeholders and the general public.
Climate change	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	The Intergovernmental Panel on Climate Change and the ACIA report about global warming expect a stronger increase in temperature in the Arctic than the global average. It has been registered an upward trend in temperature since the middle of the 70's (0,8 – 1,0 °C higher than the long term average of 1977-2006). There are indications that multiple fish populations have changed/ expanded the distribution area, spawning grounds and productivity since then as well. If the large fishpopulations in the Barents Sea continues to expand their distribution as a result of the increase in temperature and competition from new species, it is thought that several of the economical important populations will immigrate to Russian territory. The Russian may the demand a larger part of the TAC than what agreed on to this date, and the consequences can be large for Norwegian fisheries.

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
		Capelin is important pray for juvenile cod and herring in cold waters, and if the annual migration cycle changes as a result of withdrawal of the edge of the ice, it can cause big changes in the ecosystem in the Barents Sea. The deeper parts of the costal current (200 meters) are about 0, 7 °C above normal. Mackerel population has increased both its geographical distribution during summer feeding and stock size. The blue whiting biomass has almost doubled since 2010. The Norwegian spring spawning herring stock is in need of a strong year class to help bring the stock back to higher levels. There are no indications in 2015 that any of the ecosystems components are in critical state.
Competition for resources, especially freshwater	○ Strongly positive ● Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	Fishing in freshwater mostly requires permit to fish (seasonal permit or daily permit). Hardest competiotion for permits involves salmonfishing in the fall. People who fish salmon are usually concious of the surroundings and have a strong urge to preserve the AqGr in the riversystem.
Changes in values and ethics of consumers	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	From the point of view of consumers, ethical questions play an ever-greater role in the purchase and consumption of fish and seafood in Norway. In particular, animal welfare, nature conservation and consumer protection concerns are increasingly important for the marketing of fish products. This is also reflected in the growing number of eco-certifications for fish products from sustainable fisheries activities.
Other ***Add other drivers as necessary*** Add Row / Remove Row	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	

17. What countermeasures might be taken to reduce adverse impacts on the aquatic genetic resources that sustain current aquaculture and/or provide for its future development?

Describe countermeasures

Growth in the salmon industry have given more salmon lice in Norwegian fjords and is today one of the biggest problems in the industry. The increase of available hosts have given increased amount of salmon lice on wild salmonids. The government have decided (white paper 16 (2014-2015) about growth in Norwegian salmon and trout industry) that salmon lice shall not have an unacceptable reduction on the population of wild salmonids in Norway. Norway have strict regulations on salmon lice/per fish a farmed salmon is allowed to carry. This is regulated to protect the wild salmon smolts as it emigrate from freshwater to seawater and the anadromous Brown trout and Arctic char as they have a temporary stay in the fjords during summer. The fish farmers are obliged to treat the fish through pharmaceutical or non- pharmaceutical methods to keep the infection as low as possible.

To facilitate development of technology that can help to solve one or more of the challenges that Norwegian aquaculture is facing the Ministry of Trade, Industry and Fisheries made a special aquaculture permit. In addition Norway different aquaculture permits for different purposes, such as research, commercial, display, teaching etc.

A quality norm for wild stocks of Atlantic salmon in Norway was adopted by Royal Decree in 2013 under the authority of the Nature Diversity Act (Anon, 2013). This norm is a classification tool that is used to assess the status of individual salmon stocks and guide the management authorities in their decisions that may have implications for wild salmon. The quality norm has five categories ranging from very good to very poor. The management target is, with some exceptions, for each individual salmon stock to be classified as ‘good’ or ‘very good’. If a wild salmon stock is classified under the quality norm as ‘moderate’, ‘poor’ or ‘very poor’, impacts on the stock should be assessed, and a plan detailing relevant measures should be made with the goal of improving the status of the stock.

Biotechnologies

18. To what extent have the following biotechnologies been used in your country for the genetic improvement of farmed aquatic organisms.

Biotechnology	Extent of use	Comments ***main sources of information, important species for which the biotechnology is applied***
Selective breeding	○ Not at all ○ To a minor extent ○ To some extent ◉ To a great extent	salmo salar
Hybridization	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	
Polyploidy (chromosome set manipulation)	○ Not at all ◉ To a minor extent ○ To some extent ○ To a great extent	Salmo salar
Monosex production	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	
Marker assisted selection	○ Not at all ○ To a minor extent ◉ To some extent ○ To a great extent	Salmonids used in aquaculture production
Gynogenesis/androgenesis	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	
Other **Continue adding row as necessary** Add Row / Remove Row	○ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	

19. Please indicate the ways aquatic genetic resources of the wild relatives of farmed aquatic species have been impacted by drivers that are changing aquatic ecosystems. Please give countermeasures that might be taken to reduce adverse consequences for the aquatic genetic resources that sustain capture fisheries on wild relatives of farmed species.

Drivers that are changing aquatic ecosystems	Effect on AqGR ***mark appropriate box***	Countermeasures and effects
Habitat loss and degradation	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	However it is concluded that genetic impact is not a suitable indicator in the new system for capacity adjustment at the licensing level, the Norwegian authorities are currently putting great emphasis on reducing challenges following escapes of farmed salmon. "Prevention is better than cure", hence the government emphasize the necessity to prevent escapees. Examples of this are technical requirements for aquaculture installations The Norwegian Standards for sea based aquaculture facilities (NS 9415) and land based facilities (NS 9416), and the strengthening of the inspection services of the Directorate of Fisheries. The Directorate of Fisheries has for several years had a special focus on escapes of small numbers of smolts. One element in this respect has been a focus on correct mesh size in the nets according to the size of the fish that is put into the nets. They now assess that the reported numbers of escapes from the operators are closer to the real number of escapes than what has been the case previous years. In 2016, the Directorate will pay special attention to escapes from smolt production sites on land, as they have discovered that there is a problem regarding the escape of smaller fish from such farms. The funding of the monitoring of escaped fish in rivers has been strengthened from 2014, and does now cover approximately 165 rivers. The strengthening of the monitoring program have resulted in better quality and quantity of the program. In 2015, 128 rivers were assessed to have a moderate prevalence of escaped fish (< 10 %) while 17 rivers were assessed to have a high prevalence of escaped fish. There are regional differences in the prevalence of escaped fish in rivers, but generally, the prevalence of escaped fish in the years 2006 to 2015 has been gradually declining.
Pollution of waters	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Aquaculture practitioners are required to get a permit in accordance with the pollution act from the County Governor, who is the designated competent authority. When granting a permit, the County Governor assesses whether the new or expanded aquaculture site would lead to deterioration of the status of the water body. During operation, the environmental surveys are conducted in accordance with aquaculture act, and national standards have been established for these surveys. The sea bottom is surveyed according to (Norwegian Standard 9410, MOM-C). This survey maps i.a. the levels of chemicals and nutrients in the sediments and the level of oxygen. The amount of nutrients and chemicals discharged from the site is limited by the limits set in the permit on the biomass fish that can be grown in cage sites. The mandatory environmental surveys will reveal the impact from diffuse discharges. This is a safer way of keeping track of the environmental tolerance than trying to measure the exact level of diffuse material. Measures will be required immediately

Drivers that are changing aquatic ecosystems	Effect on AqGR ***mark appropriate box***	Countermeasures and effects
		to reestablish adequate conditions if pollution is beyond acceptable levels. As regards impacts from pollution, regional surveys in the most dense aquaculture areas have shown no significant effect on regional levels. Surveillance is adequate, but further needs for measures will be considered together with a strategy for environmental and sustainable growth in the aquaculture production.
Increased frequency of extreme climatic events and long-term climate change	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	So far the climate change have been positive for Norwegian fisheries. Commercially important species like cod and haddock have increased. However long-term climate change is thought to have a strongly negative impact on wild relatives of farmed aquatic species. If the greenhouse gas emissions stay at today's level it is thought that increase of temperature in the Barents Sea can be as high as 9°C. This is such a big change in temperature that it is impossible to predict what impact it will have on the ecosystems in the Northeast Atlantic and the commercially important species.
Establishment of invasive species	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Non-native invasive species represents a growing threat towards the Norwegian biodiversity. invasive species represent socioeconomic costs and a growing problem. It is important for Norway to inhibit introduction of new species and the spread of alien species already here. However in some cases, Norway is able to exploit introduced species. Snow crab was recorded in the Barents Sea for the first time in 1996 and became within a few years a self-reproductive stock. This newcomer has become a significant fishing resource in the Barents Sea, but it may also pose as a threat to the Arctic ecosystem. King crab was introduced to the Barents Sea in the 60's and the Norwegian population is managed to maintain a long term fishery within a limited fishery zone in the east of Finnmark and limit the dispersion of the crab outside the fishery zone. In these two cases, one have been able to exploit the invasive species as a resource. Other like species American lobster is more questionable. A. viridans is a pathogen to only two hosts, the American lobster, and the European lobster, H. vulgaris. American lobster have developed a resistance resulting in a small percentage being able to survive and carry the disease with them, while this disease causes 100% mortality for European lobster.Institute of Marine Research have documented that formation of hybrids can take place and in 2009 such hybrids were found in the wild. In the 1970s, Russia transferred substantial numbers of Pacific salmon (Oncorhyncus keta and O. gorbuscha) ova to the Kola Peninsula, situated close to the county of Finnmark in northern Norway, and juvenile fish were liberated into the sea. In the late 1970s and 1980s, Norwegian fishermen frequently caught Pacific ('pink') salmon in commercial nets and adults were observed spawning in some rivers in Finnmark. After the cessation of the Russian introductions about 1980, the Norwegian catches decreased until it was reported in 1990 that no pink salmon were found in Norwegian coastal waters or rivers. However, this experiment posed a threat to Atlantic salmon in Norway through possible competition for food and habitats. On behalf of the Norwegian Environment Agency NINA (Norwegian Institute of Nature Research) reported that in 2015, it was registered 25 new cases of illegal dispersal of fish species in

Drivers that are changing aquatic ecosystems	Effect on AqGR ***mark appropriate box***	Countermeasures and effects
		freshwater. According to researchers, it is in most cases active and illegal act from people who are the cause of the spread.
Introductions of parasites and pathogens	○ Strongly positive ○ Positive ○ Negative ◉ Strongly negative ○ No effect ○ Unknown	Various diseases have affected the cultured salmon industry. Some of these are endemic, e.g. vibriosis, cold water vibriosis and IPN virus, while some are of unknown origin, e.g. infectious salmon anaemia andpancreas disease. However, others are very probably. Furunculosis is believed to have been introduced to Norway with smolts from Scotland in 1986, and has caused mortality in caged fish as well as some mortality in wild fish. introduced, e.g. furunculosis caused by Aeromonas salmonica salmonica and the freshwater monogenean skin parasite Gyrodactylus salaris. The latter poses a very serious threat to wild salmonids in freshwater and can also survive in brackish water, while the IPN virus can affect salmon living in seawater and freshwater. The wild stocks of Atlantic salmon in Norway have since 1975 been very seriously depleted in freshwater by the monogenean skin parasite G. salaris,. The ability of this parasite to survive in brackish water (salinities up to 20 ‰ for as much as 18 hrs) makes it possible for its dispersal between closely situated river systems along the coast. The catastrophic mortality of most wild parr in over 30 Norwegian rivers has been caused by G. salaris that was probably introduced via stocking parr and smolts of Baltic origin, as this parasite is not normally part of the Norwegian fauna (Johnsen et al. 1999). The impact has caused a very serious threat to the viability of some of the major populations of Atlantic salmon in the world that contribute towards tourism and recreational fishing. During its maximum distribution and incidence, G. salaris reached 40 salmon watercourses in the Counties of Troms, Nordland, Nord-Trøndelag, Møre & Romsdal, Sogn & Fjordane, & Buskerud.
Impacts of purposeful stocking and escapes from aquaculture	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Knowledge of specific genetic features and characteristics is necessary in order to protect genetically independent populations from the harmful effects of stocking and resettlement measures. Norway have guidelines on how to stock anadromous fish and laws and regulation to make sure the genetic diversity in the distribution area of a species on population level is respected. We have 8 ex situ genbanks with live fish and a genbank with frozen sperm and ova from different river systems. Escaped salmon from aquaculture represent a threat toward the genetic integrity of wild salmon populations and together with salmon lice represents the biggest environmental challenges in Norwegian aquaculture. Directorate of fisheries takes all escapes of fish seriously and are working with targeted plans on how investigations of escapes should to be implemented. Norwegian aquaculture have an environmental fund, keeper of an aquaculture permit pay a fee to the fund to finance the clean-up of escaped fish. In that way the polluter gets a clearer responsibility.

Drivers that are changing aquatic ecosystems	Effect on AqGR ***mark appropriate box***	Countermeasures and effects
Capture fisheries	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	The fisheries sector, operates in accordance with the relevant water regulations, building regulations, animal welfare, veterinary matters, nature conservation and species protection regulations on a national and EU level. The fisheries laws define species protection and nature conservation as part of the intended purposes of fishing, and this is outlined in more specific detail in numerous regulations. Every year, on advice from ICES, Norwegian government decide what is total allowable catch (TAC) for each fish and allocate quota to fishermen. Inland salmon fishing is regulated with an assessment on the vulnerability of the stock and then strict regulation on when and how many fish per day one is allowed to catch. As a result, commercial fishery poses little or no threat to species diversity and fish stocks as it is well managed. Other damaging effects (e.g. accidental by-catch of endangered fish species, seal, whales and dolphins) is difficult to avoid. Norwegian law forbids grading and discard of fish and thus all fish must be taken to land, registered and if possible sold.
Other ***Continue listing other driverst*** Add Row / Remove Row	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	

Chapter 3: *In Situ* Conservation of Aquatic Genetic Resources of Farmed Aquatic Species and their wild Relatives within National Jurisdiction

The main objective of Chapter 3 is to review the current status and future prospects for the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives within national jurisdiction for food and agriculture.

The specific objectives are as follows:

- To review the current and likely future contributions to *in sit*u conservation of aquatic genetic resources of farmed aquatic species and their wild relatives by those who use them in responsible and well managed capture fisheries, aquaculture, and culture-based fisheries.
- To identify and describe any existing and planned aquatic protected areas that are contributing, or will contribute, to *in situ* conservation of aquatic genetic resources of wild relatives of farmed aquatic species.
- To identify and describe any major existing and planned efforts for the *in situ* conservation of threatened or endangered aquatic genetic resources (farmed and wild).
- To review needs and priorities for the future development of *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives.

Overview of the current status and future prospects for the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives

20. To what extent are responsible and well managed aquaculture and culture-based fisher*ies* contributing to *in situ* conservation of the aquatic genetic resources of farmed aquatic species and their wild relatives.

Please mark appropriate box.

- (●) To a great extent
- ( ) To a limited extent
- ( ) Not at all
- ( ) Not applicable

Please include any additional information

In Norway aquaculture have a tightly knit structure along the coastline. Various adapted breeding populations for aquaculture have emerged through both traditional breeding work and marker assisted selection. In the salmon industry the customers are able to select for traits. The production of salmon in Norway is based on AqGr from 41 salmon rivers collected in the period 1971 -74. Through cohesive research it was created an AqGr that was adapted to the marked. The danger of a loss of AqGR in aquaculture exists above all through the closure of breeding and propagation in fish farms or entire businesses due to economic pressure. For this reason, the conservation of resources in aquaculture is linked to a special degree with the continuation of traditional breeding businesses.
In particular stocks of Atlantic salmon (Salmo salar) and Brown trout (Salmo trutta) are being restocked in Norway. Breeding takes place in special hatcheries. Once they have reached sufficient size, the juvenile fish are released into the rivers. Culture-based fisheries started around 1850 in Norway as a desire to increase the surplus of fishing. The deploying of fish serves restocking purposes to; strengthen populations for leisure fishing, re-establish lost and weak populations. Every year there is an order to deploy about 1 850 000 salmon alevin/fry/parr/smolt and about 200 000 brown trout eyed egg/fry into Norwegian rivers.
Inland and coastal fisheries for enhancement stocking purposes exist because the natural reproduction of these species has been considerably impaired in some areas due to infestation of the leech-like parasite Gyrodactylus salaris, for example. To maintain the genetic integrity of these populations, more and more focus is being placed on the exclusive use of parent animals from home waters. In rivers where the original population is extinct, but kept in a genbank, resettlement must be implemented when conditions are present.

21. To what extent are existing facilities contributing to *in situ* conservation of aquatic genetic resources of wild relatives of farmed aquatic species?

Please mark appropriate box.

- ○ To a great extent
- ◉ To a limited extent
- ○ Not at all
- ○ Not applicable

Please include any additional information

Correct and proper stocking of wild fish of regional origin is anchored by law in Norway and forms an important basis for the in situ conservation of wild species of AqGR.

Sea-ranching in Norway mainly consist of scallops and European lobster. For both species the sea ranching is based on releasing juveniles into dedicated areas with suitable habitats, in order to increase the harvestable stock. Sea-ranch areas can be subject to exclusive rights obtained by those releasing juveniles. The release can also be carried out as part of a general government enhancement program. Lobsters released into the wild in their natural environment are recaptured (harvested) when they have attained a marketable size. Sea Ranching is of importance to European lobster as many areas with lobster population is protected by regulations.

Norway also have been restocking rivers with salmonids for quite some time. The work with establishing genbanks for salmonids started in 1986 and have since then been of importance for reestablishment of populations.

22. Please provide ex*amples* of current or planned activities for the *in situ* conservation of endangered or threatened farmed species and their wild relatives with demonstrated or potential importance for aquaculture, culture-based fisheries, and capture fisheries.

Please describe examples

Because of acid rain a number of waterways (Aust Agder, Veste Agder, Rogaland, Hordaland and Sogn og Fjordane) is trated with lime. Tovdalsvassdraget and Arendalsvassdraget in Aust-Agder, Lygna, Audna and Mandalsvassdraget in Vest-Agder, Sokndalselva, Bjerkreimsvassdraget and Ogna in Rogaland, Ekso i Hordaland and Flekke-Guddalsvassdraget in Sogn og Fjordane just to mention a few. Many river systems that have been affected by acid rain have had the salmon populations re-established after having been totally eradicated. Some of the river systems currently have a very good recreational salmon fishing

Populations that have been re-established and taken out of living gen bank is Beiarelva, Aureelva, Valldalselva, Norddalselva og Byaelva. These river systems had to have chemical treatment after being infected with G. salaris. The Some rivers in the region of Rauma (Rauma, Innfjordelva og Måna) are starting treatment spring 2015 and are expected to need re-establisment of the population because of the parasite G. salaris. About 30% of the salmon water systems are regulated for power generation. This applies to many of the biggest salmon rivers (Altaelva, Ranaelva, Stjørdalselva, Nidelva, Surna, Driva, Eira/Aure, Lærdalselva, Vosso, Sultdalslågen, Mandalselva). To ensure the integrity of the system mitigated measures are taken. Some may include fish stairs and release of eggs, fry / juveniles or smolts. We try to put out as early of a life stages as possible, preferably egg planting when possible.

23. Please rank (from 1 to 10) the importance of the following objectives for *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives in your country.

Objectives of *in situ* conservation	Rank 1=Very Important 10=No importance
Preservation of aquatic genetic diversity	4
Maintain good strains for aquaculture production	4
Meet consumer and market demands	4
To help adapt to impacts of climate change	6
Future breed improvement in aquaculture	5
Please continue listing any other objectives as needed	
Add Row / Remove Row	

Review of the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives through their use in responsible and well managed aquaculture and culture-based fisheries

24. Is the *in situ* conservation of aquatic genetic resources included in the policy as an objective in the management of aquaculture and/or culture-based fisheries in your country?

Please mark appropriate box

- (●) Yes
- ( ) Not yet, but planned to be included
- ( ) No
- ( ) Unknown

If yes, please give examples

It is not included in the objective in national legislation as such. Norwegian aquaculture legislation focus on profitability and competitiveness within sustainability utilisation of nature, and AqGr is included in that sense. Marine culture-based fisheries are governed by the Aquaculture Act and in that sence have the same objectives as all other aquaculture. Limnic aquaculture and culture based fisheries (leisure fishing) is governed by the Biodiversity Act and the Salmon and Inland fishing Act. These acts objectives are sustainability and biodiversity.

25. To what extent are collectors of wild seed and brood stock for aquaculture and culture-based fisheries contributing to the conservation of aquatic genetic resources by maintaining habitats and/or limiting the quantities collected?

Please mark appropriate box

- (●) To a great extent
- ( ) To a limited extent
- ( ) Not at all
- ( ) Not applicable

Please include any additional details

Review of the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives through their use in responsible and well managed capture fisheries

26. Is the conservation of aquatic genetic resources of wild relatives of farmed aquatic species included as an objective in the management of any capture fisheries in your country?

Please mark appropriate box

If yes, please give examples

- (●) Yes
- ( ) Not yet, but under development
- ( ) No
- ( ) Unknown

The Marine Resources Act specifically mentions management of AqGr as an objective. The Inland and salmon fishing Act focuses mostly on sustainability and does not mention AqGr specifically. Inland fishing has regulations which has its legal basis in the Biodiversity Act and the Salmon and Inland fishing Act. The purpose of the Act is to protect biological, geological and landscape diversity, ecological processes are ensured by sustainable use and conservation, also so it provides as a foundation for human activity, culture, health and well-being, now and in the future, also for Sami culture.

Review of the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives through the establishment and management of aquatic protected areas

27. Please list any aquatic protected areas in your country that are contributing to the *in situ* conservation of aquatic genetic resources of wild relatives of farmed aquatic species and an assessment of effectiveness

Add Row

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
There are too many freshwater aquatic protected areas in Norway in order to list every single one	( ) Very effective (●) Somewhat effective ( ) Not effective ( ) Unknown	Stortinget vedtok Verneplan for vassdrag i 1973, 1980, 1986, 1993, 2005 og 2009. (Verneplan I, II, III, IV, supplering og avsluttende supplering). Verneplanen, som består av 389 objekter, omfatter ulike vassdrag som til sammen skal utgjøre et representativt utsnitt av Norges vassdragsnatur. Hensikten med verneplanen er å sikre helhetlige nedbørfelt med sin dynamikk og variasjon fra fjell til fjord. Vernet gjelder først og fremst mot kraftutbygging, men verneverdiene skal også tas hensyn til ved andre inngrep.	X
Regulation No 692 of 2013 on conservation of Fremvaren in Vest-Agder as a marine protected area (MPA). https://lovdata.no/dokument/MV/forskrift/2013-06-21-692?q=marine verneområder	( ) Very effective (●) Somewhat effective ( ) Not effective ( ) Unknown	MPA Framvaren have specific chemical conditions and the area is regarded as unique in a global context in terms of opportunities to conduct research on biological and chemical processes associated with the formation of rocks. Conservation values and the scientific value is linked to the high sulphide content in the waters of Framvaren, the sediments and deeper water is oxygen free, thus unaffected by animals and plants. Conservation purpose is related to the seabed and is thought to have a positive impact on the ecosystem.	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
Regulation No 693 of 2013 about conservation of Tauterryggen in North-Trøndelag as a marine protected area (MPA). https://lovdata.no/dokument/MV/forskrift/2013-06-21-693	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	MPA Tauterryggen is an area of 44 km2 and consist of a marginal deposit/glacial deposit in Trondheimsfjorden. Conservation purpose is related to the seabed and is thought to have a positive impact on the ecosystem.	X
Regulation No 694 of 2013 on conservation of Saltstraumen in Nordland as a marine protected area (MPA). https://lovdata.no/dokument/MV/forskrift/2013-06-21-694?q=marine verneområder	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	Saltstraumen is a small strait with one of the strongest tidal current in the world. In addition to the main current, through Saltstraumen, there is a connection out from Skerstadfjorden through Indre Sundan and Sundstraumen in the southwest and Godøystraumen in the northeast. The special pattern of currents have a positive impact on biodiversity in the area. Conservation purpose is related to the seabed and is thought to have a positive impact on the ecosystem.	X
National salmon fjords and salmon rivers	( ) Very effective (●) Somewhat effective ( ) Not effective ( ) Unknown	At present, 49 naturally reproducing salmon stocks are considered to be critically threatened or lost. In all, 73 salmon stocks have been lost, but it has been possible to re-establish 27 of these after the most serious threats (acidification and the salmon parasite Gyrodactylus salaris) have been brought under control. According to the Norwegian Scientific Advisory Committee for Atlantic Salmon Management, escaped farmed salmon and sea lice are the most serious threats at population level that are not currently under control, while other threats (Gyrodactylus, acid rain, regulation for hydropower purposes and physical alteration of river systems) have been brought under control. They can still pose a threat to wild salmon stocks, but there is a lower risk that they will further reduce salmon production or cause the loss of more stocks in the future.	X
Real Time Closures (RTC)	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	Norway and the European Union have agreed to establish a system of Real Time Closures (RTC) in the North Sea and Skagerrak. This agreement came into force 1 September 2009 and gives the possibility to close fishing grounds in the North Sea and Skagerrak for the protection of juveniles and small fish. In accordance with section 47 second paragraph of the regulations relating to sea-water fisheries the Directorate of Fisheries are given the legal authority to close and open fishing grounds for the protection of juveniles and small fish in the North Sea and Skagerrak. In accordance with the RTC regime a restricted fishing ground will be closed for 21 days if the intermixture of juvenile or small fish of cod, saithe, haddock and whiting exceeds the criteria's specified in the agreement. The area is closed for all fishing gears other than pelagic trawls targeting pelagic species, purse seines, driftnets and jiggers targeting herring, mackerel, horse mackerel, gillnets with a mesh size of 120 mm and above and pots.	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
Regulations no 8 of 2016 on the protection of coral reefs from degradation as a result of fishing activity	○ Very effective ○ Somewhat effective ○ Not effective ◉ Unknown	This regulation have a number of coordinates that represents areas that are protected and give orders on what fishing gear (if any) are allowed in that area.	X

Chapter 4: *Ex Situ* Conservation of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction

The main objective of Chapter 4 is to review the current status and future prospects for the *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives.

The specific objectives are:

- To review existing *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives in aquaculture facilities, culture collections and gene banks, research facilities, zoos and aquaria;
- To review the contributions that various stakeholders are making to the *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives;
- To review needs and priorities for the future development of *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives, including any that are threatened or endangered.

Review of existing and planned collections of live breeding individuals of aquatic genetic resources of farmed aquatic species and their wild relatives

28. Please list your country's existing collections of live breeding aquatic organisms that can be considered as contributing to the *ex situ* conservation of aquatic genetic resources. This includes not only collections of species farmed directly for human use, but also collections of live feed organisms (e.g., bacterial flocs, yeasts, microalgae, rotifers and brine shrimp (*Artemia*)).

Add Row

Species (*include information on subspecies or strain in comments if available*)	Type of use ***Please mark all that apply***	Is the species (or subspecies) threatened or endangered for example in the IUCN Red List, CITES Appendices or national lists? ***Please mark appropriate box***	Comments ***Please list any additional information***	
Salmo salar	☒ Direct human consumption ☐ Live feed organism ☒ Other	◉ Yes ○ No ○ Unknown	For salmon, there are parent fish collections that are kept as ex situ collections for resettle-ment purposes as a genetic reserve for the purpose of re-production. Some salmon populations are considered endangered.	X
gadus morhua	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	parent fish collections are kept as ex situ collections so genetic improvement done with respect to desirable phenotypes for aquaculture purposes are preserved	X
Microalga	☐ Direct human consumption ☒ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	Live feed for Cod and halibut	X

Species (*include information on subspecies or strain in comments if available*)	Type of use ***Please mark all that apply***	Is the species (or subspecies) threatened or endangered for example in the IUCN Red List, CITES Appendices or national lists? ***Please mark appropriate box***	Comments ***Please list any additional information***	
Artemia salina	☐ Direct human consumption ☒ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	Live feed for Cod and halibut	X
Salmo Trutta	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown		X
Salvelinus alpinus	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown		X
Homarus gammarus	☒ Direct human consumption ☐ Live feed organism ☐ Other	◉ Yes ○ No ○ Unknown	Sea ranching	X
Chlamys islandica	☐ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ○ No ○ Unknown		X
Echinoidea	☐ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ○ No ○ Unknown		X

Review of existing *ex situ* conservation activities of aquatic genetic resources of farmed aquatic species and their wild relatives *in vitro*.

29. Please list your country's *in vitro* collections and gene banks of the gametes, embryos, tissues, spores and other quiescent forms of farmed aquatic species and their wild relatives , using cryopreservation or other methods of long-term storage. Describe the major examples, identifying the facilities in which the collections are held. Include examples of any such genetic material from your country that is being kept in *in vitro* collections outside your country on behalf of beneficiaries in your country.

Add Row

Species (include information on subspecies or strain if available in comments)	Users and managers ***List all that apply***	Type of *ex-situ* conservation collection *in vitro* ***mark all that apply***	Facilities where collection is located ***mark all that apply***	Comments ***list all breeds, subspecies of the species and any additional information***	
Contents of the Marbank collection at present: • Taxonomic vouchers from approximately 1000 invertebrate/ vertebrate species • Genetic samples from 265 invertebrate/ vertebrate species • Extracts from from roughly 400 invertebrate/ vertebrate species • Approximately 3000 isolates of marine bacteria • Approximately 50 strains of marine micro algae • Approximately 800 isolates of marine fungi	Marbank - Institute of Marine Research	☒ In vitro collection of gametes ☒ In vitro collextion of embryos ☐ In vitro collection of tissues ☒ Spores ☒ Other	☐ Aquaculture facilities ☒ Research facilities ☒ Universities ☐ Zoos and aquaria ☐ Other	Marbank collects and prepares samples of marine organisms from Norwegian waters for research, commercial opportunities and exploitation purposes. The Marbank collection houses several types of marine biological material, most of which are processed in some way. The marine products include samples from marine invertebrates and vertebrates, bacteria, fungi and algae. All available samples will be listed in the searchable web-catalogue. Here orders can be placed. A brief description of the purpose of receiving the material must be included when placing the order. Until the web-catalogue is operative customers are kindly asked to contact Marbank for further information.	X

Species (include information on subspecies or strain if available in comments)	Users and managers ***List all that apply***	Type of *ex-situ* conservation collection *in vitro* ***mark all that apply***	Facilities where collection is located ***mark all that apply***	Comments ***list all breeds, subspecies of the species and any additional information***	
Gadus morhua	Nofima	☐ In vitro collection of gametes ☐ In vitro collextion of embryos ☐ In vitro collection of tissues ☐ Spores ☒ Other	☒ Aquaculture facilities ☒ Research facilities ☒ Universities ☐ Zoos and aquaria ☐ Other	Nofima has been commissioned by the government to operate a national breeding programme for cod, the aim of which is to improve the production characteristics of cod in aquaculture. The Centre for Marine Aquaculture came into use in 2005.	X
Genbank for wild salmon	Most important collaboration partners in addition to hatcheries • Statkraft • Helgelandskraft • Veterinærinstituttet • Cryogenetics; GENO Hallsteingård • Marel Norge • Norsk Institutt for Naturforskning - NINA	☒ In vitro collection of gametes ☒ In vitro collextion of embryos ☐ In vitro collection of tissues ☐ Spores ☐ Other	☒ Aquaculture facilities ☒ Research facilities ☐ Universities ☐ Zoos and aquaria ☒ Other	Tissue from which the cells originate: entire specimen – juvenile animal Storage of live fish is a measure that is implemented for the most endangered salmon populations. Endangered strains are kept until it is safe to restock. The gene bank delivers roe to local hatcheries that produce fish for restocking purposes. Norway have established three genbank stations for live fish and one for frozen sperm.	X

30. Please rank (from 1 – 10) the importance of the following objectives for ex situ conservation of aquatic genetic resources of farmed aquatic species and their wild relatives in your country

Objectives of *ex situ* conservation	Rank 1=Very Important 10=No importance
Preservation of aquatic genetic diversity	1
Maintain good strains for aquaculture production	1
Meet consumer and market demands	10
To help adapt to impacts of climate change	10
Future breed improvement in aquaculture	5
Other ***Continue adding row as necessary***	
Add Row / Remove Row	

Chapter 5: Stakeholders with Interests in Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction

The main objective of Chapter 5 is to provide an overview of the perspectives and needs of the principal stakeholders who have interests in aquatic genetic resources of farmed aquatic species and their wild relatives for food and agriculture. Stakeholder groups can be identified from existing institutional knowledge, from sectoral and sub-sectoral consultations conducted during the country reporting process and where necessary from expert opinions. Gender issues pertaining to the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives should be considered, as well as the perspectives and needs of indigenous peoples and local communities.

The specific objectives are:

- To describe the different principal stakeholder groups with interests in aquatic genetic resources of farmed aquatic species and their wild relatives To identify the type(s) of aquatic genetic resources of farmed aquatic species and their wild relatives in which each stakeholder group has interests and why.

- To describe the roles of stakeholder groups and the actions they are taking for the conservation, sustainable use and development of the aquatic genetic resources in which they have interests.

- To describe the further actions that stakeholder groups would like to see taken for the conservation, sustainable use and development of aquatic genetic resources in which they have interests, and the constraints that are hindering those actions, including lack of capacity and perceived threats.

Overview of the principal stakeholder groups who have interests in aquatic genetic resources of farmed aquatic species and their wild relatives

31. Please indicate the principal stakeholder groups who have interests in aquatic genetic resources of farmed aquatic species and their wild relatives including, *inter alia*: fish farmers; fishers in capture fisheries; persons involved in stocking and harvesting in culture-based fisheries; persons employed in postharvest chains; government officials; staff and members of aquaculture associations; managers of aquatic protected areas and others working for the conservation of aquatic ecosystems; researchers; and civil society.

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Fish Farmers	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Fish farmers are perhaps the primary drivers for change and trends in the industry, since they have "hands-on" experience by dealing with the resources in the natural environment on a day-to-day basis
Fishers	☐ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☒ Species ☐ Other	Same as fish farmers

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Fish hatchery people	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☐ Research ☐ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	the same principle as fish farmer and fishers
People involved in marketing	☐ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☒ Species ☐ Other	unknown or little influence
Government resource managers	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☐ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Fishing or aquaculture associations	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☐ Research ☐ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	
Aquatic protected area managers	☒ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☐ Marketing ☐ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	
Policy Makers	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Are involved within the framework of legislative processes in all listed areas and provide funds for the implementation of programmes and research projects geared towards the protection and sustainable use of AqGR.

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Non-Governmental Organizations	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	
Intergovernmental Organizations	☒ Conservation ☒ Production ☐ Feed manufactoring ☐ Breeding ☒ Research ☐ Marketing ☐ Processing ☐ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	
Donors	☐ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☐ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	unknown or little influence

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Consumers	☐ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☒ Species ☐ Other	Indirectly through comsumer trends

a) Please indicate the most important role of women in regards to AqGR

In Norway, women enjoy the same rights as men, although women are less represented in the sector in absolute figures compared to men.

There are not specific issues directed to gender equality in regards to AqGR in Norway.

b) Please indicate the most important role of indigenous and local communities in regards to AqGR

The Sami Parliament of Norway is the representative body for people of sami heritage in Norway. It acts as an institution of cultural autonomy for the indigenous Sami people. They are involved in a great deal of issues relevant for the Sami people in Norway and also cooperating with other indigenous communties on the international level. One of the issues are the CBD and the Nagoya-protocol and the topic of access and benefit-sharing of genetic resources in relation to traditional knowlegde.

Chapter 6: National Policies and Legislation for Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction

The main objective of Chapter 6 is to review the status and adequacy of national policies and legislation concerning aquatic genetic resources of farmed aquatic species and their wild relatives including access and benefit sharing.

The specific objectives are as follows:

- To describe the existing national policy and legal framework for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.
- To review current national policies and instruments for access to aquatic genetic resources of farmed aquatic species and their wild relatives and the fair and equitable sharing of benefits arising from their utilization.
- To identify any significant gaps in policies and legislation concerning aquatic genetic resources of farmed aquatic species and their wild relatives..

Review of national policies and legislation for Aquatic Genetic Resources of farmed aquatic species and their wild relatives within national jurisdiction

32. Please list national legislation, policies and/or mechanisms that address aquatic genetic resources of farmed species and their wild relatives (see question 47 regarding international agreements).

Add Row

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Act No. 79 of 2005 Aquaculture Act	Jun 17, 2005	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	The purpose of the Act is to promote the profitability and competitiveness of the aquaculture industry within the framework of a sustainable development and contribute to the creation of value on the coast. This Act establishes a regulatory framework for the aquaculture industry in inland waters and marine waters including the territorial sea, the EEZ and the Continental shelf of Norway. The Act consists of 34 sections divided into 8 Chapters.; The Ministry may grant a license ("aquaculture license") for the production of specific species in limited geographic areas (sites) subject to prescribed restrictions attached to the license. The Act specifies the conditions on which a license may be granted. Allocation of aquaculture licenses for salmon, trout and rainbow trout shall be subject to specific Regulations to be issued by the Ministry. The Act further: (a) lays down requirements of environmental sustainability of aquaculture operations, including the obligation to restore the aquaculture site and adjoining areas if the production is discontinued; (b) defines the relationship of licensed aquaculture operations to land-use plans and nature or cultural heritage conservation measures; (c) provides for the registration, transfer and mortgaging of aquaculture licenses; (d) provides for administrative control and supervision, and (e) defines sanctions for the contravention of provisions of this Act or prescribed pursuant to this Act.	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 1675 of 2009 on sanctions, sanctions for contravention of the Aquaculture Act	Dec 20, 2013	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☒ Other	The Regulation's goal is to ensure that provisions made in adherence to the Aquaculture Act are implemented. The regulations provided detail rules on coercive determination of the administrative forfeiture and assessment of infringement penalties for Aquaculture Act. The Fisheries Directorate shall reduce or waive fines incurred in special circumstances. Statutory authority: Aquaculture Act	X
Regulation No. 823 of 2008 on establishment and expansion of aquaculture installations, zoo boutiques and similar.	June 17, 2008	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	This Regulation contains rules relative to aquaculture facilities for fish, mollusks and crustacean.; The aim of the Regulation to safeguard the health and well-being of aquaculture animals in fish farms. It shall apply to aquaculture and mariculture in the territory of Norway, its continental shelf and the economic zone. The Regulation requires aquaculture facilities to be registered with, and to report to the State Food Agency. Statutory authority: Aquaculture Act and Animal Welafare Act	X
Regulation No. 1798 of 2004 on authorizations for the breeding of salmon, trout and rainbow trout (Salmon Allocation Decree).	Dec 22, 2004	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	This Regulation makes provision for the authorization of aquaculture for all purposes of salmon, trout and rainbow trout in saltwater and freshwater. It defines conditions for authorization and criteria for the operation of aquaculture. The Regulation shall apply to the Norwegian territory and the continental shelf and the EEZ of Norway. Permits are granted by the Directorate of Fisheries. The criteria for the grating of a permit mainly concern location and the impact on the environment of the proposed installation. Statutory authority: Aquaculture Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 1799 on authorizations for the breeding of fish species other than salmon, trout and rainbow trout.	Dec 22, 2004	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	This Regulation makes provision for the authorization of commercial fish breeding installations in saltwater and freshwater for fish species other than salmon, trout and rainbow trout. It defines conditions for authorization and criteria for the operation of aquaculture and mariculture of such species. The Regulation shall apply to the Norwegian territory and the continental shelf and the EEZ of Norway. It shall apply both to breeding of fish for consumption and stock enhancement purposes. Permits are granted by the Directorate of Fisheries. The criteria for the grating of a permit mainly concern location and the impact on the environment of the proposed installation. Statutory authority: Aquaculture Act	X
Regulation No.1110 of 2003 on granting of rights regarding sea ranching and to the carrying out of such activities.	Aug 28, 2003	☐ Genes or molecules only ☐ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☒ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	This Regulation makes provision for the authorization of aquaculture of crustaceans, mollusk and echinoderms in the form of sea ranching. It defines conditions for authorization and criteria for the operation of sea ranching. The purpose of the Regulation is to keep this industry at profitable and competitive level and at the same time to safeguard the coastal landscape and the health of aquatic animals. Permits are granted by the county authorities. The Department of Fisheries may make territorial divisions at a national, regional or local level for purposes of rational development and the protection of the environment. The Regulation shall apply to the Norwegian territory and the continental shelf and the EEZ of Norway. Statutory authority: Aquaculture Act and Food Safety Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 754 of 2013 on license granting for aquaculture fishing of salmon, trout and rainbow trout in seawater in 2013.	26.06.2013	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The purpose of this regulation is to help facilitate sustainable and competitive aquaculture which can contribute to growth along the maritime coast, and that can encourage new technological solutions to reduce the escape of farmed fish and spread of salmon lice. The Regulations applies to the debt allocation of up to 45 licenses for salmon, trout and rainbow trout in sea aquaculture and recovery of up to 35 previously given permissions. Distribution of awarded licenses is classified in Group A (Finnmark and Troms), Group B (open group with closed bidding round) and Group C (open group). Statutory authority: Aquaculture Act and Food Safety Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Act No. 124 of 2003 Food Safety Act	Dec 19, 2003	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☒ Other	The purpose of this Act is to ensure safe and wholesome food, to promote health, quality and consumer concerns along the whole production chain, and to provide for sustainable production. The Act is also intended to promote sound plant and animal health. Furthermore, the Act is intended to take into account the interests of operators throughout the production chain, including market access abroad. This Act applies to all factors pertaining to the production, processing and distribution of intermediate inputs at the level of primary production and of food, including drinking water. The Act also applies to all factors pertaining to the production of materials and articles that are intended to come into contact with or that may have an effect on intermediate inputs and food. Furthermore, the Act applies to all use of intermediate inputs. The Act applies to all factors pertaining to plant and animal health, including products, articles and organisms that may spread infection. The Act applies to Norwegian land territory, the territorial sea, Norwegian aircraft and vessels and installations on the Norwegian continental shelf. The Act consists of 36 sections divided into 7 Chapters: Purpose, scope and definitions (I); General requirements and obligations (II); Specific requirements and obligations (III); Taxes, fees, compensation, etc. (IV); Administrative provisions, sanctions and penal measures (V); Other provisions (VI); Entry into force and transitional provisions (VII).	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 961 of 2009 on special requirements for aquaculture-related activities in national salmon watercourses and national salmon fjords.	Jun 22, 2009	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The main aim of the Regulation is to protect important salmon stocks in water systems and salmon fjords. This Regulation lays down rules for establishment, moving and operation of aquaculture installations, including slaughter and processing facilities, in national salmon water systems and fjords. The Regulation places restrictions on fish breeding in the waters specified in the Schedule. Some provision concern the placing and equipping of installations and the control of diseases listed in Regulation No. 819 of 2008 in annex 1. Statutory authority: Aquaculture Act and Food Safety Act	X
Regulation No. 849 of 2011 on requirements of technical standards for floating aquaculture facilities.	Aug 16, 2011	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	Purpose of this Regulation is to prevent escaping of fish through ensuring a reasonable technical standard on sea cages and feed barns. This Regulation establishes a regulatory framework for floating aquaculture facilities including the territorial sea, the EEZ and on the Continental shelf of Norway. Technical specification of sea cages and feed barn must follow Norwegian standard 9415:2009 or a European/international standard that is equivalent to 9415:2009. The Regulation consists of 35 sections divided into 9 Chapters: Scope, application sphere and definitions (I); Accreditation of inspection and certification organ (II); Survey of aquaculture locality (III); Component requirements (IV); Analysis of mooring and outlay of the mooring line (V); Requirements of vendor of main components (VI); Facility certificate (VII); Use and maintenance of facility (VIII); Final provisions (IX). The Regulation does not apply to net cages for restitution purposes of capture-based aquaculture. Statutory authority: Aquaculture Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 822 of 2008 on the operation of aquaculture installations.	Jun 17, 2008	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The main aim of the Regulation is to safeguard a strong fish farming sector in a sustainable manner and the safeguarding of the health and well-being of aquaculture animals. It includes both active an fallowed sea cages/feed barns. The Regulation does not include sea ranching of crustaceans, mollusk and echinoderms, capture based aquaculture and management of recovery cages or live storage of wild captured fish. The Regulation makes provision, among other things, in relation with; requirements and conditions for the operation of fish farms, health control, protection of the environment, use of potentially harmful substances, production of biomass, use and quality control of water for aquaculture facilities, slaughtering of aquaculture animals and handling of dead animals. The Regulation shall apply in the territory of Norway, its continental shelf and the economic zone. Statutory authority: Aquaculture Act and Food Safety Act	X
Regulation No. 266 of 2011 on increase of total allowed biomass of salmon, trout and rainbow trout for an aquaculture license in the counties Finnmark and Troms.	March 08, 2011	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	Purpose of this Regulation was to implement an increase of total allowed biomass for licenses of salmon, trout and rainbow trout in sea water in Finnmark and Troms county by 5 % for a consideration in 2011. Holder of a license had to send a declaration to the county authorities they belonged to with accompanying documentation. Statutory authority: Aquaculture Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 1140 on control of salmon lice in aquaculture	Dec 5, 2012	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The Regulation applies to licensed establishments of fish farms (in accordance to Regulation No. 823 of 17 June 2008). Purpose of this Regulation is to reduce the incidence of salmon lice (Lepeophtheirus salmonis) on both wild and aquaculture salmonids as well as reduce and prevent development of drug resistance in salmon lice. Aquaculture facilities must present a plan for effective monitoring and control of sea lice, coordinated within a specified geographic area determined by hydrography and location of aquaculture facilities. The approved planning shall follow requirements such as time and limit of treatment (medicinal treatments only), boundary of lice, reduction of the biomass, prevention, temperature monitoring, and reported to the Norwegian Food Safety Authority latest 1st of October. In special cases, the Authority may grant exemptions from the provisions of this Regulation, provided it does not conflict with international obligations, including EEA Agreements. Threshold is set to a maximum of 0.5 adult female sea lice present per fish. Aquaculture facilities in areas such as Rogaland, Hordaland, Sogn og Fjordane, Møre og Romsdal, Sør Trøndelag shall be subject to treatment between 5 March and 10 April each year. In Nord Trøndelag and Nordland between 26 March and 1 May. In Troms and Finnmark between 26 March and 1 June.; Appendix 1 - Requirements for routine counting of lice. Statutory authority: Food safety Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 89 of 2015 on joint responsibility for escaped farmed fish.	Feb 5, 2015	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The purpose of this Regulation is to reduce the risk of genetic influence from aquaculture on wild stocks of salmon. In order to fulfill this aim, a joint responsibility entity (Samanslutninga) shall regulate the provisions herein for the planning and coverage of expenses in the implementation of measures reducing the incidence of escaped farmed fish of the species of salmon, trout and rainbow trout in rivers which have a high concentration of unacceptable amount of escaped fish (over 10 %). The Samanslutninga shall meet every year and before 30 June with at least three weeks' written notice. Statutory authority: Aquaculture Act	X
Regulation No. 192 of 1997 on disinfection of water flowing into and water flowing out from aquaculture-related operations.	Feb 20, 1997	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	This Regulation aims at limiting the risk of transmitting infectious diseases affecting aquatic organisms by providing for adequate disinfecting of water which is supplied to or discharged from aquaculture installations. It applies to prescribed operations in the field of fish farming and processing, transportation of fish and importation of fish. The Regulation consists of 19 sections divided into 5 Chapters: Scope, application sphere and definitions (I); Requirements relative to disinfecting of incoming and outflowing water (II); Approval of methods and technical equipment (III); Approval procedure and supervision arrangements (IV); Final provisions (V). Chapter II specifies criteria for the disinfecting of water used in installations for breeding of salmon and other freshwater fish, in fish slaughter and processing facilities, in land-based aquaculture installations, and for transport. In Chapter III standards for allowed disinfecting methods are specified. Statutory authority: Food Safety Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 1831 of 2014 on capture-based aquaculture.	Dec 15, 2014	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The purpose of this Regulation is to facilitate the capture-based aquaculture and promote equitable supply of good quality fresh fish, fish health and welfare. The operations shall be technically, biologically and environmentally acceptable. The document applies to the Norwegian territorial land and waters, the continental shelf and to the Economic Zone. County authorities are responsible for granting of a license. The Regulation does not apply to temporary cages for live storage of fish up to 12 weeks. Cleaning and disinfection of installation, production units and equipment shall occur regularly, while the installation must be emptied of fish by 31 December each year and fallowed for a minimum of two months. Clearance by locality: Locality for capture-based aquaculture must be environmentally safe with particular emphasis on applicant's need for land, alternative use of areas for other activities, including aquaculture. Statutory authority: Animal Welfare Act, Aquaculture Act and Food Safety Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 819 of 2008 on the placing on the market of aquaculture animals and aquaculture products and prevention, limitation and eradication of disease in aquatic organisms.	July 25, 2008	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☒ Other	The Regulation aims at the safeguarding of health of aquaculture animals. It prescribes animal health measures relative to placing on the market, importation and transit of aquaculture animals and products of aquaculture animals. The Regulation shall apply to the territory of Norway, its continental shelf and the economic zone. The Regulation makes provision, among other things, in relation with: categorization of diseases affecting aquaculture animals; animal health requirements for the placing on the market of aquaculture animals and products within the European Economic Area; import and transit of aquaculture animals and products from third countries; disease control measures; and health certificates and documents relative to the origin of aquaculture animals and products. Suspicion of any disease must be reported to Norwegian Food Safety Authority. Annexes states the Norwegian status of listed diseases. Statutory authority: Food Safety Act	X
Regulation No. 821 of 2008 on approval and use of means of disinfecting in aquaculture facilities and transport units.	Jun 17, 2008	☐ Genes or molecules only ☐ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The regulation aims at the safeguarding of health of aquaculture animals. It concerns the approval and use of disinfecting substances in aquaculture facilities and transport units which transports live aquaculture animals on the territory of Norway, its continental shelf and the economic zone. Disinfecting substances shall be approved, upon application, by the State Medicinal Products Agency. The Agency shall inquire as to the quality of the product and its effects on men, animals and the environment. At certain conditions, the Agency may revoke approval and introduce a temporary prohibition of sale of the product without for which approval has been revoked. The State Food Agency shall publish a list of approved substances. Statutory authority: Food Safety Act	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 60 of 2011 on further requirements for the transportation, placing on the market and importation of aquaculture animals and aquaculture products	Jan 18, 2011	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☒ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	This Regulation prescribes further animal health requirements in relation with the production, transportation, processing, placing on the market and the importation of aquaculture animals and aquaculture products. These requirements are based on defined Community legislation and are further to Regulation No. 819 of 2008 on the placing on the market of aquaculture animals and aquaculture products and prevention, limitation and eradication of disease in aquatic organisms and Regulation No. 820 of 2008 relative to the transport of aquatic organisms. The objective of the Regulation is to prevent the spreading of transmittable animal diseases affecting aquaculture animals. Statutory authority: Food safety Act	X
Regulation No 1250 of 2006 on slaughterhouses and manufacturing of aquaculture animals	Oct 30, 2006	☐ Genes or molecules only ☐ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	Purpose of this Regulation is to promote animal health and welfare during the process of slaughtering. Byproducts and drainage water must be separated. All drainage water must be treated according to Regulation No. 197 of 1997 relative to disinfection of water flowing into and water flowing out from aquaculture-related operations. In special cases, the Authority may grant exemptions from the provisions of this Regulation, provided it does not conflict with international obligations, including EEA Agreements. Statutory authority: Food safety Act and Animal Welfare Act	X
Act No 36 of 2009 on management of wild marine resources	Jan 01, 2009	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other		X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 431 of 2012 on fishing of anadromous salmonids in sea	May 10, 2012	☐ Genes or molecules only ☐ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	The regulations goal is to ensure that time periods for fishing of anadromous salmonids in the sea is respected. It defines an annual fishing season for wild salmonids and defines the allowed fishing gear.	X
Act No 15 of 2000 the right to participate in Norwegian fisheries	Jan 01, 2000	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☒ Access and benefit sharing ☐ Other	Purpose of this Act is to adjust the harvesting capacity of the fishing fleet to the resources available and ensure a sustainable exploitation of marine resources, to increase profitability and added value in the industry and through this safe housing and employment in coastal areas, and to facilitate that the harvesting of marine resources still benefits the costal population.	X
Act No. 42 of 1997 on the facilitation of the Norwegian coast guard	Nov 15, 1999	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☒ Access and benefit sharing ☐ Other	This Act gives general provisions on facilitation on the Norwegian coastal guard. The Act specify tasks, relations with other regulatory authorities, control and enforcement measures of the Norwegian coastal guard. The last chapter of the Act defines criminal provisions.	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 1878 of 2004 on the practice of fishing in the sea	May 01, 2005	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other	This regulation applies for fishing in the sea This Act establishes a regulatory framework for the fishing in the territorial sea, the EEZ and the Continental shelf of Norway, with the exception of fishing for anadromous salmonids. The Act consists of 101 sections divided into 19 Chapters. It provides regulations of mesh design on fishing gear, selection in trawl and seine fishing, restrictions on the use of trawls and seines, restrictions on the use of nets, gillnets, longlines and traps, restrictions on fishing within inlet lines , provisions on joint fishing operations and pooling of pelagic catches, ban on fishing certain species at certain times, bycatch when fishing outside Skagerrak, bycatch when fishing in Skagerrak, minimum size of fish and measures to limit catches of undersized fish, prohibition of discard and milling of fish, prohibition of trawling within 12 nautical mil (trawling free zones and flexible areas), access to trawl within 12 nautical mile from the baselines of the Norwegian mainland, protection of coral reefs, calibration document and cargo drawings, Retro reflecting markings on fishing vessels, Marking of fishing gear, loss of fishing equipment and tidiness the harvest field, catching of fish to be kept alive, as well as recovery and temporary storage of fish, Regulatory powers, violation fines, penalties.	X
Regulation No. 1418 on access to participate in the inshore fishing for 2016	1.1.2016-31.12.2016	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other	The regulation contains provisions concerning restrictions on the right to participate in certain fisheries in 2016.	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
Regulation No. 1157 of 2006 on special licenses to engage in certain types of fisheries.	Oct 13, 2006	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☒ Access and benefit sharing ☐ Other	The regulation contains provisions regarding the granting of permission to conduct trawling, granting of permission to conduct shrimp trawling, award of licenses to engage in fishing with purse seine, granting of permission to engage in seine fishing for saithe, granting of permission to engage in seine fishing, granting of permission to harvest minke whales, granting of permission for hunting seal.	X
Act No. 91 of 1979 on Norwegian Exclusive Economic Zone	Dec 17, 1976	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☒ Access and benefit sharing ☐ Other		X
Regulation No 1144 of 2013 on permit of acquisition, registration and marking of fishing vessels	Jan 01, 2013	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☒ Other		X
Regulation No. 604 of 2015 on declaration of landing on fish and sales note	Jan 01, 2015	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other		X

Review of the current status and gaps in national policies and legislation for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives

33. Please list any gaps in the coverage or constraints in implementing national legislation, policies and/or mechanisms in regard to aquatic genetic resources.

Norwegian legislation – the Norwegian ABS Framework
The Nature Diversity Act implements the CBD and the Nagoya Protocol.
1. Definitions
(c) biological diversity: ecosystem and species variability and intra-species genetic variability, and the ecological relationships between ecosystem components;
(f) genetic material: genes and other hereditary material in any biological material that can be transferred to other organisms with or without the help of technology, except for human genetic material;

The Nature Diversity Act Chapter VII has rules on access to genetic material. According to section 57 Genetic material obtained from the natural environment is a common resource belonging to Norwegian society as a whole and managed by the state. It shall be utilised to the greatest possible benefit of the environment and human beings in both a national and an international context, also attaching importance to appropriate measures for sharing the benefits arising out of the utilisation of genetic material and in such a way as to safeguard the interests of indigenous peoples and local communities.

Section 58 (collection and utilisation of genetic material obtained from the natural environment)
The King may determine that the collection of biological material from the natural environment for the purpose of utilising the genetic material, or the utilisation of such material, requires a permit from the Ministry. If a collection permit has been granted, no new permit is required for subsequent utilisation, but the conditions for the permit apply correspondingly to any person that acquires the material or results arising from the collection. Collection for use in public collections and for use and further breeding or cultivation in agriculture or forestry does not require a permit.
The first paragraph does not limit the right of any owner or other entitled person to deny access on other grounds
a) to the biological material, or
b) to the land
from which the genetic material is obtained.

When granting permission under the first paragraph, the competent authority may grant exemptions from the provisions of chapter III.

The King may make regulations regarding which information the application shall contain, including information regarding use of the knowledge of indigenous peoples or local communities. Further provisions may also be made in the regulations regarding which conditions may be set, such as conditions to the effect that any benefits arising out of the utilisation of genetic material collected from the natural environment within Norwegian jurisdiction shall accrue to the state. The regulations may also state how the interests of landowners and indigenous peoples and local communities can be reasonably safeguarded. Conditions may be set for the further utilisation of material that is necessary to ensure the promotion of the objective set out in section 57.
Section 59 (genetic material in public collections)
Public collections shall be managed in accordance with the principles set out in section 57. The person managing the collection has a duty to register any genetic material removed from the collection and provide public access to such information.
A public collection means a collection of genetic material that is managed by or on behalf of the state and to which any person has access on specified conditions.
Any person that receives genetic material derived from a public collection shall refrain, in Norway or abroad, from claiming intellectual property rights or other rights to the material that would limit use of the material, such as use for food or agriculture, unless the material has been modified in a way that results in a substantial change.
If intellectual property rights over genetic material are established contrary to the third paragraph, the competent authorities under the Act shall consider taking measures, including bringing legal action, to ensure promotion of the objective set out in section 57.
Any person may invoke conditions under the third paragraph, or other conditions that have been set for collection, against any person that, contrary to such conditions, seeks to enforce an intellectual property right.
The King may make further regulations regarding removals from collections, including setting such conditions as are mentioned in section 58, fourth paragraph, last sentence.
With regard to the removal of genetic material covered by the International Treaty on Plant Genetic Resources for Food and Agriculture of 3 November 2001 or by another international agreement, the standard conditions laid down under the agreement shall apply.

Important to note is also that the King do not have the competence to regulate on the removal of genetic material from a private gene bank.
Section 60 (genetic material from other countries)

The import for utilisation in Norway of genetic material from a state that requires consent for collection or export of such material may only take place in accordance with such consent. The person that has control of the material is bound by the conditions that have been set for consent. The state may enforce the conditions by bringing legal action on behalf of the person that set them.
When genetic material from another country is utilised in Norway for research or commercial purposes, it shall be accompanied by information regarding the country from which the genetic material has been received (provider country). If national law in the provider country requires consent for the collection of biological material, it shall be accompanied by information to the effect that such consent has been obtained.
If the provider country is a country other than the country of origin of the genetic material, the country of origin shall also be stated. The country of origin means the country in which the material was collected from in situ sources. If national law in the country of origin requires consent for the collection of genetic material, information as to whether such consent has been obtained shall be provided. If the information under this paragraph is not known, this shall be stated.
The King may make regulations prescribing that if utilisation involves use of the traditional knowledge of local communities or indigenous peoples, the genetic material shall be accompanied by information to that effect.
When genetic material covered by the International Treaty on Plant Genetic Resources for Food and Agriculture of 3 November 2001 is utilised in Norway for research or commercial purposes, it shall be accompanied by information to the effect that the material has been acquired in accordance with the Standard Material Transfer Agreement established under the treaty.
Section 61 (implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture)
The King may make regulations regarding the implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture of 3 November 2001 in Norwegian law. The regulations may make further clarifications and exemptions from the provisions of this chapter.

The Marine Resources Act
Chapter 2 Marine bioprospecting
Section 9 The conduct of marine bioprospecting
The King may prescribe that harvesting and investigations in the sea in connection with marine bioprospecting require a permit from the Ministry.
The provisions of this Act apply to marine bioprospecting in so far as they are appropriate.
The King may adopt regulations on marine bioprospecting; these may among other things grant exemptions from provisions made in or under the Act, prescribe the types of information applications shall include, and set out further rules on the types of conditions that may be laid down.

Section 10 Benefits arising out of the use of marine genetic material
A permit issued under section 9 may lay down that a proportion of the benefits arising out of the use of Norwegian marine genetic material shall accrue to the state.

The Norwegian Patents Act
Section 8 b. If an invention concerns or uses biological material or traditional knowledge, the patent application shall include information on the country from which the inventor collected or received the material or the knowledge (the providing country). If it follows from the national law in the providing country that access to biological material or use of traditional knowledge shall be subject to prior consent, the application shall state whether such consent has been obtained.

If the providing country is not the same as the country of origin of the biological material or the traditional knowledge, the application shall also state the country of origin. The country of origin means for biological material the country from which the material was collected from its natural environment and for traditional knowledge the country in which the knowledge was developed. If the national law in the country of origin requires that access to biological material or use of traditional knowledge shall be subject to prior consent, the application shall state whether such consent has been obtained. If the information set out in this subsection is not known, the applicant shall state that.

The duty to disclose information concerning biological material under the first and second paragraphs applies even where the inventor has altered the structure of the received material. The duty to disclose information does not apply to biological material derived from the human body. When the biological material is aquired in accordance with Art. 12 No. 2 and 3 of the International Treaty on Plant Genetic Resources for Food and Agriculture of November, 3, 2001, a copy of a standard material transfer agreement according to Art 12.4 of the Treaty shall accompany the patent application instead of the information mentioned in paragraphs two and three.

Breach of the duty to disclose information is subject to penalty in accordance with the General Civil Penal Code § 221. The duty to disclose information is without prejudice to the processing of patent applications or the validity of rights arising from granted patents.
Section 8 c. If an invention concerns or uses biological material from the human body, the patent application shall include information on whether the person from whom the material has been derived has given his/her consent to the use of the biological material, in accordance with the law of 21st February 2003 no 12 about bio

banks.
Identical provisions are found in the Plant Breeders Act.

34. Please indicate any national aquatic genetic resources of farmed aquatic species and their wild relatives for which your country restricts access.

Type of genetic resource (can be species name, DNA, gametes or other descriptor)	Comments ***Please, provide verifiable main sources of information, effectiveness of the restriction, description of type of restriction and for whom does the restriction apply***
DNA	
Stock, breed or variety	
Species	
Other **Continue adding row as necessary** Add Row / Remove Row	

35. Over the past 10 years, indicate the actions your country has taken to maintain or enhance access to aquatic genetic resources of farmed aquatic species and their wild relatives located outside your country; for example, by establishing germplasm acquisition agreements or material transfer agreements.

Add Row

Action taken to enhance access to aquatic genetic resources outside your country	Type of genetic resource ***Mark all that apply***	Comment ***for example other types of genetic resources***	
	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☐ Living specimens		X

36. Please indicate any obstacles your country has encountered when trying to access aquatic genetic resources of farmed aquatic species and their wild relatives outside of your country (including access for research purposes).

Obstacles to accessing aquatic genetic resources	Please describe type of genetic resource ***mark all that apply***	Comments ***please include additional information as needed***
Intellectual property protection	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
National laws of your country	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
National laws of donor country	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
Internationl laws or protocols	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
Too expensive	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
Material transfer agreements required	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
Knowledge gaps	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	
Public perception	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	

Obstacles to accessing aquatic genetic resources	Please describe type of genetic resource ***mark all that apply***	Comments ***please include additional information as needed***
Other **Continue adding row as necessary** Add Row / Remove Row	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	

Chapter 7: Research, Education, Training and Extension on Aquatic Genetic Resources within National Jurisdiction: Coordination, Networking and Information

The main objective of Chapter 7 is to review the status and adequacy of national research, education, training and extension, coordination and networking arrangements and information systems that support the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives for food and agriculture.

The specific objectives are:

- To describe the current status, future plans, gaps, needs and priorities for research, training, extension and education on the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives
- To describe existing or planned national networks for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.
- To describe existing or planned information systems for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.

Research

37. Does your national research programme support the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives? If yes, give details of current and/or planned research; if no, explain the main reasons why not in box below.

Please mark appropriate box

- (●) Yes
- ( ) No
- ( ) Unknown

Please provide details

All of approved research programs in Norway concerning marine and limnic AqGr support conservation, sustainable use and development of farmed aquatic species and their wild relatives. Below we have given a couple examples.

Aquaculture – An Industry in Growth, 2006-2015 (HAVBRUK) is one of seven programmes under the Research Council's Large-scale Programme initiative. In this final phase, the HAVBRUK programme will be giving priority to research activities that promote sustainability and environmental relevance. The implementation of the revised work programme for the 2011-2015 period is designed to help to realise the vision: Norway – the world's leading aquaculture nation.
http://www.forskningsradet.no/prognett-havbruk/Programme_description/1226994216945

The BIOTEK2021 programme has been established as part of the implementation of the national strategy for biotechnology. The strategy identifies biotechnology as a key element in the development of the agricultural, marine, industrial and health sectors.

The strategy also identifies four cross-cutting focus areas:
• biotechnology and society;
• international cooperation;
• industrial development;
• competencies and infrastructure.

The strategy provides a framework for research initiatives in the interface between social challenges, national competitive advantages and opportunities inherent in biotechnology activities. The complexity and dynamics of interaction between research, technology and society are increasing rapidly, giving rise to a need for greater knowledge and reflection about the changes we are facing.
http://www.forskningsradet.no/prognett-biotek2021/Programme_description/1253970728220

The Norwegian Seafood Research Fund (FHF) - is the Norwegian seafood industry's tool in managing the industry's investments into industry-based R&D. The clear objective is to create added value for the seafood industry. FHF is financed by the industry itself through an R & D levy on exports of all seafood (currently 0,3%). The FHF board is appointed by the Ministry of Fisheries and Coastal Affairs, and comprised of representatives from the industry. Industry foundation is further strengthened through a series of advisory groups consisting of active players in the industry.
http://www.fhf.no/om-fhf/about-fhf/

38. Please list main institutions, organizations, corporations and other entities in your country that are engaged in field and/or laboratory research related to the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.

Add Row

Main institutions, organizations, corporations and other entities	Area of research ***Mark all that apply***	Comments ***Please provide any additional information***	
The Arctic University of Norway - campus Tromsø - campus Harstad University College - campus Alta	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☒ Economic valuation of aquatic genetic resources ☒ Conservation of aquatic genetic resources ☒ Communication on aquatic genetic resources ☒ Access and distribution of aquatic genetic resources ☐ Other		X
University of Bergen	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☐ Genetic improvement ☐ Economic valuation of aquatic genetic resources ☐ Conservation of aquatic genetic resources ☐ Communication on aquatic genetic resources ☐ Access and distribution of aquatic genetic resources ☐ Other		X

Main institutions, organizations, corporations and other entities	Area of research ***Mark all that apply***	Comments ***Please provide any additional information***	
University of Oslo	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☐ Economic valuation of aquatic genetic resources ☐ Conservation of aquatic genetic resources ☐ Communication on aquatic genetic resources ☐ Access and distribution of aquatic genetic resources ☐ Other		X
Nord universitet - Bodø: Havbruksdrift og ledelse - Bachelor - Steinkjer: Husdyrfag, velferd og produksjon Bachelor	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☒ Economic valuation of aquatic genetic resources ☐ Conservation of aquatic genetic resources ☐ Communication on aquatic genetic resources ☐ Access and distribution of aquatic genetic resources ☐ Other		X

Main institutions, organizations, corporations and other entities	Area of research ***Mark all that apply***	Comments ***Please provide any additional information***	
Norges miljø- og biovitenskapelige universitet - Ås - Husdyrvitenskap	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☒ Economic valuation of aquatic genetic resources ☒ Conservation of aquatic genetic resources ☒ Communication on aquatic genetic resources ☐ Access and distribution of aquatic genetic resources ☐ Other		X

39. What capacity strengthening is needed to improve national research in support of the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives?

Please rank the following in regard to capacity strengthening.

Capacities	Rank 1=Very Important 10=No importance
Improve basic knowledge on aquatic genetic resources	1
Improve capacities for characterization and monitoring of aquatic genetic resources	2
Improve capacities for genetic improvement	1
Improve capacities for genetic resource management	3
Improve capacities for economic valuation of aquatic genetic resources	3
Improve capacities for conservation of aquatic genetic resources	3
Improve communication on aquatic genetic resources	4
Improve access to and distribution of aquatic genetic resources	8
Add other rows as appropriate and rank Add Row / Remove Row	

Please describe any other capacity building needs in regards to aquatic genetic resources

Education, training and extension

40. Please indicate the extent that education, training and extension in your country covers the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives? List the main institutions involved and the types of courses offered.

Add Row

Institution	Thematic Area	Type of courses **mark all that apply**	Comments	
The Arctic University of Norway - campus Tromsø - campus Harstad University College - campus Alta	Genetic resource management	☒ Undergraduate ☒ Post-graduate ☒ Training ☐ Extension		
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☒ Extension	International Fisheries Management	
	Genetic improvement	☒ Undergraduate ☒ Post-graduate ☐ Training ☒ Extension		X
	Economic valuation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☒ Extension		
	Conservation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☒ Training ☒ Extension		

University of Bergen	Genetic resource management	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Genetic improvement	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		X
	Economic valuation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Conservation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
University of Oslo	Genetic resource management	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension		
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension		
	Genetic improvement	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension		X
	Economic valuation of aquatic genetic resources	☐ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension		
	Conservation of aquatic genetic resources	☐ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension		

Nord universitet - Bodø: Havbruksdrift og ledelse - Bachelor - Steinkjer: Husdyrfag, velferd og produksjon Bachelor	Genetic resource management	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		X
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Genetic improvement	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Economic valuation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Conservation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
Norges miljø- og biovitenskapelige universitet - Ås - Husdyrvitenskap	Genetic resource management	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		X
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Genetic improvement	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Economic valuation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Conservation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		

Coordination and networking

41. Please list any mechanisms within your country responsible for coordinating the aquaculture, culture-based fisheries and capture fisheries subsectors with the other sectors that use watersheds and coastal ecosystems and have impacts on aquatic genetic resources of wild relatives of farmed aquatic species (e.g., agriculture, forestry, mining, tourism, waste management and water resources).

If no mechanism exists check here: ☐

Add Row

Name of mechanism	Description of how mechanism operates	
Law on protection against pollution and waste (Pollution Control Act) LOV-1981-03-13-6	Ministry of Climate and Environment is the responsable authority and county administrator is reinforce the Act	X
Regulation on water FOR-2006-12-15-1446 and Act on salmon and innland fishing LOV-1992-05-15-47	Ministry of Climate and Environment The Norwegian Water Resources and Energy Directorate	X
Planning and Building Act LOV-2008-06-27-71	Ministry of Local Government and Modernisation is responsable for the Act Through planning the physical environment the municipalities have to ensure quality and opportunities of constructions.	X
Food Act LOV-2003-12-19-124	Ministry of Health and Care Services, Ministry of Trade, Industry and Fisheries and Ministry of Health and Care Services are responsable for the Act The Food Act is intended to ensure food safety and promote health benefits, quality and consumer considerations throughout the entire aquaculture production chain. The Act applies to all aspects of aquaculture production and processing, as well as distribution of intermediate inputs at the primary food production level. The act also includes general requirements and obligations to ensure compliance with the purpose of the Act. The Norwegian Food Safety Authority is responsible for controlling that aquaculture companies are operating in compliance with the Act. The Authority is empowered to take any decisions and measures deemed necessary to ensure implementation of the provisions laid down in or pursuant to this Act.	X
Aquaculture Act LOV-2005-06-17-79	The main purpose of the Act is to promote the profitability and competitiveness of the aquaculture industry within the framework of sustainable development. The Aquaculture Act establishes the framework for the aquaculture industry's future through responsible development with due regard for the environment and effective use of the coastal zone.	X

Name of mechanism	Description of how mechanism operates	
Act of 17th of April 2009 no. 19 on harbours and freeways	Ministry of trade and communication in responsible for the Act and the local authorities have the responsibility to manage the Act in the municipalities	X
Act on watercourses and groundwater LOV-2000-11-24-82	Ministry of Petroleum and Energy	X

42. Please indicate how capacity strengthening can be improved in intersectoral coordination in support of the conservation, sustainable use and development of aquatic genetic resources.

Please rank the following in regards to capacity strengthening.

Capacities	Rank 1=Very Important 10=No importance
Increase awareness in institutions	1
Increase technical capacities of institutions	2
Increase information sharing between institutions	1
Add other rows as appropriate and rank Increase personnel capacities of institutions Add Row / Remove Row	1

Please specify in box below

43. Please list any national networks in your country or any international networks your country belongs to that support the conservation, sustainable use and development of aquatic genetic resources.

Add Row

Network	Objectives of the network ***Please mark all that apply*** to your country	Comments	
The Council for anadromous salmonids	☒ Improve basic knowledge on aquatic genetic resources ☒ Improve capacities for characterization and monitoring of aquatic genetic resources ☒ Improve capacities for genetic improvement ☒ Improve capacities for economic valuation of aquatic genetic resources ☒ Improve capacities for conservation of aquatic genetic resources ☒ Improve communication on aquatic genetic resources ☒ Improve access to and distribution of aquatic genetic resources	The council was establishes in 2009 as a result of White paper no. 32 (2006-2007) on protection of the wild salmon and commissioning of national salmon riversytems and fjords, and is appointed by the Norwegian Environment Agency. The Council consists of representatives from organizations whose purpose is preserving, rebuilding and protecting fish resources. Organizations associated with the management of salmon are invited as observers. Composition of the council: •Finnmarkseiendommen •Lakseelvene i Finnmark •Norges Jeger- og Fiskerforbund •Norges Bondelag •Norsk Bonde- og Småbrukarlag •Norges Fiskarlag •Norges Grunneigar- og Sjølaksefiskarlag •Norges Naturvernforbund •Norges skogeierforbund •Norske Lakseelver •Norskog •Sametinget •Sjølaksefiskerne i Finnmark •WWF	X
Regional fishery organisations (RFO s), e.g. North East Atlantic Fisheries Commission (NEAFC) Northwest Atlantic Fisheries Organization (NAFO) The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) International Whaling Commission (IWC) North Atlantic Salmon Conservation Organization (NASCO) Convention on Biological Diversity (CBD)	☐ Improve basic knowledge on aquatic genetic resources ☒ Improve capacities for characterization and monitoring of aquatic genetic resources ☐ Improve capacities for genetic improvement ☒ Improve capacities for economic valuation of aquatic genetic resources ☒ Improve capacities for conservation of aquatic genetic resources ☒ Improve communication on aquatic genetic resources ☐ Improve access to and distribution of aquatic genetic resources	please see chapter 8, question 46	X

Network	Objectives of the network ***Please mark all that apply*** to your country	Comments	
Marine Biotechnology ERA-NET (an international network) http://www.marinebiotech.eu/marine-biotechnology-era-net	☒ Improve basic knowledge on aquatic genetic resources ☒ Improve capacities for characterization and monitoring of aquatic genetic resources ☐ Improve capacities for genetic improvement ☒ Improve capacities for economic valuation of aquatic genetic resources ☐ Improve capacities for conservation of aquatic genetic resources ☒ Improve communication on aquatic genetic resources ☒ Improve access to and distribution of aquatic genetic resources	The Marine Biotechnology ERA-NET (ERA-MarineBiotech) recognises that Europe's marine ecosystems and organisms are largely unexplored. This resource, through the coordinated application of marine biotechnology, has the potential to provide a major contribution towards addressing some of the most pressing societal challenges including environmental degradation, human health and delivering sustainable supplies of food and energy, amongst others. The vision of the ERA-MBT project is to support Europe's marine biotechnology community to participate in a lasting enterprise-driven network that adds value to marine biological resources in ways that nurture and sustain the lives of European citizens. The ERA-MarineBiotech is therefore designed to deliver better coordination of relevant national and regional Research, Technology, Development and Innovation (RTDI) programmes in Europe, reducing fragmentation and duplication, and paving the way for common programmes and cooperation in the provision and use of research infrastructures. A necessity to make sustainable use of this unique resource. The Marine Biotechnology ERA-NET is a consortium of 19 national funding bodies or representants from 14 countries that will work with stakeholders from industry and organisations to identify needs and gaps in the value chain from research and development, through optimising research results for proof of concept and industrial uptake and valorisation.	X

Information systems

44. Please list any information systems existing in your country for receiving, managing and communicating information about the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.

Add Row

Name of information system	Type of information stored ***mark all that apply***	Main stakeholders ***mark all that apply***	
Institute of Marine Research Main task is to provide advice to Norwegian authorities on aquaculture and the ecosystems of the Barents Sea, the Norwegian Sea, the North Sea and the Norwegian coastal zone.	☒ DNA sequence ☒ Genes and genotype ☒ Breeds, strains or stocks ☒ Species names ☐ Production figures ☒ Distribution ☒ Level of endangerment ☒ Other	☐ Fish farmers ☐ Fishers in capture fisheries ☐ Fish hatchery people ☐ People involved in marketing ☒ Government resource managers ☒ Fishing or aquaculture associations ☐ Aquatic protected area managers ☒ University and academic people ☒ Non-Governmental Organizations ☐ Intergovernmental Organizations ☐ Policy makers ☐ Donors ☐ Consumers ☐ Politicians **Please list other stakeholders as necessary**	X

Name of information system	Type of information stored ***mark all that apply***	Main stakeholders ***mark all that apply***	
Norwegian Seafood Council http://en.seafood.no/ NSC is the industry's main source for market insight based on statistics, trade information, consumption and consumer insight. We provide effective and rational services for Norwegian seafood exporters that adds to their knowledge and insight in bringing their products to market. The services provided give the industry continuous access to important insight that forms the basis of strategic decisions and competitive advantages.	☐ DNA sequence ☐ Genes and genotype ☐ Breeds, strains or stocks ☐ Species names ☒ Production figures ☒ Distribution ☐ Level of endangerment ☐ Other	☒ Fish farmers ☒ Fishers in capture fisheries ☐ Fish hatchery people ☐ People involved in marketing ☒ Government resource managers ☐ Fishing or aquaculture associations ☐ Aquatic protected area managers ☐ University and academic people ☐ Non-Governmental Organizations ☐ Intergovernmental Organizations ☐ Policy makers ☐ Donors ☐ Consumers ☐ Politicians **Please list other stakeholders as necessary**	X

Name of information system	Type of information stored ***mark all that apply***	Main stakeholders ***mark all that apply***	
The national marine biobank ("Marbank") http://www.imr.no/marbank/en The mission of Marbank is to provide national and international academia and industry with easy access to marine biodiversity, its associated data and extractable products. There is a special focus on samples for marine bioprospecting i.e. the systematic search for interesting and unique genes, molecules and organisms from the marine environment with features that could be useful to society and/or have potential for commercial development.	☒ DNA sequence ☒ Genes and genotype ☒ Breeds, strains or stocks ☒ Species names ☐ Production figures ☒ Distribution ☐ Level of endangerment ☐ Other	☐ Fish farmers ☐ Fishers in capture fisheries ☐ Fish hatchery people ☐ People involved in marketing ☐ Government resource managers ☐ Fishing or aquaculture associations ☐ Aquatic protected area managers ☒ University and academic people ☐ Non-Governmental Organizations ☐ Intergovernmental Organizations ☐ Policy makers ☐ Donors ☐ Consumers ☐ Politicians **Please list other stakeholders as necessary** Biotech business community	X

Name of information system	Type of information stored ***mark all that apply***	Main stakeholders ***mark all that apply***	
Norwegian Biodiversity Information Centre (artsdatabanken) http://www.biodiversity.no/Pages/135580 The goal of NBIC is to serve as a national source of information on species and ecosystems in Norway, and to make up-to-date information on biodiversity widely available and easily accessible to the society.	☐ DNA sequence ☐ Genes and genotype ☒ Breeds, strains or stocks ☒ Species names ☐ Production figures ☒ Distribution ☒ Level of endangerment ☐ Other	☐ Fish farmers ☐ Fishers in capture fisheries ☐ Fish hatchery people ☐ People involved in marketing ☒ Government resource managers ☐ Fishing or aquaculture associations ☐ Aquatic protected area managers ☒ University and academic people ☒ Non-Governmental Organizations ☐ Intergovernmental Organizations ☒ Policy makers ☐ Donors ☐ Consumers ☒ Politicians **Please list other stakeholders as necessary**	X

45. What capacity strengthening is needed to improve national information systems to support the conservation, sustainable use and development of aquatic genetic resources?

Please describe what capacities need to be strengthened

Please describe any other capacity building needs in regards to information systems for aquatic genetic resources

Chapter 8: International Collaboration on Aquatic Genetic Resources of Farmed Aquatic Species and Their Wild Relatives

The main objective of Chapter 8 is to review the mechanisms and instruments through which your country participates in international collaborations on aquatic genetic resources of farmed aquatic species and their wild relatives.

The specific objectives are:

- To identify your country's current participation in bilateral, sub-regional, regional, other international and global forms of collaboration on aquatic genetic resources. List national memberships, status as a Party and other forms of affiliation in agreements, conventions, treaties, international organizations, international networks and international programmes.
- To identify any other forms of international collaboration on aquatic genetic resources.
- To review the benefits from existing forms of international collaboration on aquatic genetic resources.
- To identify needs and priorities for future international collaboration on aquatic genetic resources

International collaboration includes bilateral arrangements and the sharing of particular waters and stocks of wild relatives of farmed aquatic species.

International, regional or sub-regional agreements, conventions and treaties concerning aquatic genetic resources of farmed aquatic species and their wild relatives

46. Please list the international, regional or sub-regional agreements your country subscribes to that cover aquatic genetic resources of farmed species and their wild relatives, such as the Nagoya Protocol[2] the Convention on Biological Diversity and the Cartagena Protocol and how they have impacted aquatic genetic resources and stakeholders in your country. Examples could include:

[2] http://www.cbd.int/abs/nagoya-protocol/signatories/

- Establishment and management of shared or networked aquatic protected areas as far as wild relatives of farmed aquatic species are concerned
- Aquaculture and culture-based fisheries in transboundary or shared water bodies
- Sharing aquatic genetic material and related information
- Fishing rights, seasons and quotas as far as wild relatives of farmed aquatic species are concerned
- Conservation and sustainable use of shared water bodies and watercourses as far as wild relatives of farmed aquatic species are concerned
- Quarantine procedures for aquatic organisms and for control and notification of aquatic diseases

Add Row

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
United Nations Convention on the Law of the Sea, UNCLOS)	1996	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect		X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
Convention on Biological Diversity (CBD)	1993	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect	Norwegian National Biodiversity Strategy and Action Plan was approved as a White paper by the Cabinet in December 2015 and it will be discussed in the Parliament in 2016. The White paper is a direct result of the Aichi targets, which created a unique opportunity for the Norwegian government to evaluate challenges facing biodiversity and efforts needed to ensure the conservation and sustainable use of it. The previous national biodiversity strategy was presented 14 years ago. Generally, the state of Norwegian ecosystems is relatively good and, if managed wisely, they will be capable of sustaining a flow of important ecosystem services. The administrative, economic and legal framework in Norway has been identified as an important reason for this situation. Still, biodiversity in Norway is under increasing pressure from a variety of sources. Land conversion and land-use change, climate change, invasive alien species, harvesting and pollution have been identified as the most important direct drivers for biodiversity loss and ecosystem degradation. The cumulative effects of these drivers are increasing the pressure on the ecosystems, making continued monitoring and efforts	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
				even more important. The new NBSAP requires that all Norwegian authorities, industrial sectors and other relevant actors play their part in efforts to ensure conservation and sustainable use of biodiversity. The government's policy for managing biodiversity in Norway can be summarized in the following main points: • Ensure knowledge-based sustainable management of nature by identifying the desired state or condition for all main ecosystems, including the definition of "good ecological status" and efforts needed to reach agreed target • Addressing climate change in natural resource policy and practice • Building capacity at local level for better management of ecosystems and biodiversity • Continuous efforts for the conservation of threatened species and habitats • Systematic conservation planning to secure an ecological representation in conservation areas • Strengthening the knowledge base for better management of biodiversity	

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
				• Provide tailor-made solutions for the management of the different types of ecosystems (marine and coastal ecosystems, fresh water ecosystems, forests, wetlands, mountain areas, cultural landscapes and open lowlands, polar ecosystems) Electronic version of the White paper in Norwegian is available at: https://www.regjeringen.no/no/dokumenter/meld.-st.-14-20152016/id2468099/?ch=1&q=	X
Cartagena Protocol	2000	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ◉ No effect	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ◉ No effect	No genetically modified aquatic species for cultivation, food or feed uses approved in Europe.	X
Nagoya-Protocol	2014	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ◉ No effect	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ◉ No effect	Too early to estimate the impact	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
FAO Code of Conduct for Responsible Fisheries	1995	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	The Code sets out principles and international standards of behavior for responsible practices with a view to ensuring the effective conservation, management and development of living aquatic resources, with due respect for the ecosystem and biodiversity. The Code recognizes the nutritional, economic, social, environmental and cultural importance of fisheries and the interests of all stakeholders of the fishing and aquaculture industries. The Code takes into account the biological characteristics of the resources and their environment and the interests of consumers and other users.	X
The most important regional fisheries organisations (RFOs)	NAFO 1978 NEAFC 1980 NASCO 1983 NAMMCO 1992 CCAMLR 1982 SEAFO 2003 ICCAT 2004 IWC 1960	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Marine areas and fisheries on the high seas outside the exclusive economic zone of a country (200 nautical miles from the coast) are generally managed by regional fisheries organisations (RFOs). The RFOs can stipulate catch and fishing effort limits in the various marine areas, define technical measures and monitor compliance with obligations.	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
Bilateral agreements with -Russia -Iceland -Faro Island -Greenland -European Union	-Russia 1975 -Iceland 1999 -Faro Island 1979 -Greenland 1992 -European Union 1978	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	For most stocks of interest to Norway, assessments are made jointly with scientists from several countries under the aegis of ICES. Scientists from the ICES member countries work together on the collected stock data in annual working groups. Russia (JointFish) Norway and Russia share the stocks of cod, haddock and capelin in the Barents Sea. The main part of the Norwegian cod exported is North East Arctic Cod. Only a very small amount of cod that is exported from Norway comes from other areas. Close cooperation between the two countries is needed to ensure rational management of these fishery resources. The cooperation with Russia in the north takes place in the Joint Norwegian-Russian Fisheries Commission. The Commission has a thirty years history of developing management strategies and setting TACs (Total Allowable Catch) for shared stocks European Union The cooperation with the EU on the management of joint stocks in the North Sea involves a higher number of shared stocks than between Russia and Norway. Norway and the EU have developed	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
				management strategies for several joint stocks. These strategies are intended to ensure a national harvesting pattern and stable catch levels. The parties have agreed on long-term management plans for cod, haddock, saithe and herring. Greenland The agreement on bilateral fisheries collaboration between Norway and Greenland, signed in September 1991, is based on a common understanding of the need to exclude illegal unreported and unregulated fisheries (IUU) in each country's exclusive economic zone. Under the agreement, vessels from Norway and Greenland are permitted to fish in one another's exclusive economic zone. Iceland Norway, Iceland and Russia have a trilateral fisheries agreement where Iceland accepts that the northern fish stocks in the Norwegian Sea and the Barents Sea are regulated through the Joint Norwegian-Russian Fisheries Commission. Faroe Islands Norway also has bilateral agreements with the Faroe Islands on fisheries. Norway conducts negotiations on quotas with the Faroe Islands every year.	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
Washington Agreement on International Trade in Endangered Species of Wild Fauna and Flora	1976	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect	CITES provisions may restrict trading and possession of some kinds of AqGR.	X
four-party agreement with Russia, Faro Island, Iceland and EU	2007	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Management of the Norwegian spring-spawning herring Norwegian spring-spawning herring have been the largest fish population in the North Atlantic ocean and the largest herring population in the world. The population have declined the last few years. From 1997 to 2003 Norway, Russia, Faro Island, Iceland and EU managed the stock together and Norway was entitled to 57%. 2007 Norway increased its part to 61%. Faro Island have claimed a higher percentage of the stock the last few years and there have been some disputes on how to allocate the resources. Norway have had a four-party agreement with the other coastal states, but there has been no agreement for 2015 and 2016. Norway has set a quota of 193 294 tons which corresponds to our traditional part (ICES advisory) of the total quota.	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
				Management of capelin at Iceland, Greenland and Jan Mayen A three party agreement was signed on 12 June 1989 by Iceland, Greenland and Norway. Regulation of capelin fishing has been re-negotiated three times. The key elements of the agreement deals with entitled percentage of the total quota of capelin, and to what extent the parties can fish its quota in zones of others parties. Management of blue whiting General agreement was signed in 2005 of EU, Norway, Iceland and Faro Island after years of negotiating, and have been followed up with annual quota agreements. The agreement stated that a certain amount of TAC was don't in international waters and the rest was allocated between the coastal states. Management of Mackerel Norway, EU and the Faro Island had a management agreement from 1999 – 2000. In 2010 the coastal states could not agree anymore and in the period of 2010 -2014 the met over 20 times trying to agree about a new agreement concerning the management of Mackerel. The reason was that the Faroes	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
				wants a larger share of the TAC and Iceland made a claim for coastal states share of Mackerel. In March 2014 EU, Norway and Faro Island signed an agreement valid for 5 years where mutual access to each other's fishing zones is included. EU, Norway and Faro Island managed to agree in regards to management both in 2015 and 2016. Norwegian quota is 201 633 tons (26,67%). Management of redfish There are several species of redfish in the North East Atlantic ocean. The populations with gratest commercial interest is the population of deep sea redfish situated in Irminger Sea, Barents Sea and the Norwegian Sea. In 2005 a new fishery for deep sea redfish started and the populations are exploited by several states (Norway, Russia, Greenland and Iceland). According to NEAFC Norway has the right to fish 74% of the TAC in the Barents Sea and Norwegian Sea and 3,85 % in the Irminger Sea.	X
Norway and Sweden Svinesund, Iddefjord and the river Enningdal.	1991 (updated 2010)	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	In 2010 Norway and Sweden signed a new agreement about management of salmon and trout in Svinesund, Iddefjord and the river Enningdal.	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
Norway and Finland about fishing in the Tana river system	1873 (Updated 1990)	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Since 1873 Norway and Finland have had a mutual agreement about fishing in the Tana river system. The Norwegian regulation applies to anadromous part of the river system in Norway. Management of the river system ensure fish stocks in Tana as a natural basis for settlement and for Sami culture. The regulation includes all fish species and the allowable fishing gear.	X
Norway and Finland about fishing in the Neiden river system	1971 (Updated 1984/85)	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	collaboration between holder of a legal right to fish in Norwegian (Neidenelvens fish community) and Finnish side to follow up the agreement locally and ensure that stocks are managed in a sustainable manner.	X
Norway and Russia about fishing in the border area in Pasvik and Pasvik river		○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	The agreement between the countries applies to regulation of fishing and ensuring that stocks are managed in a sustainable manner. Each country has its own fishing regulation with the agreement as statutory authority.	X
A three party agreement by Iceland, Greenland and Norway	12 June 1989	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Management of capelin at Iceland, Greenland and Jan Mayen A three party agreement was signed on 12 June 1989 by Iceland, Greenland and Norway. Regulation of capelin fishing has been re-negotiated three times. The key elements of the agreement deals with entitled percentage of the total quota of capelin, and to what extent the parties can	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
				fish its quota in zones of others parties.	
General agreement of Management of blue whiting	2005	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Management of blue whiting General agreement was signed in 2005 of EU, Norway, Iceland and Faro Island after years of negotiating, and have been followed up with annual quota agreements. The agreement stated that a certain amount of TAC was don't in international waters and the rest was allocated between the coastal states.	X
Norway, EU and the Faro Island had a management agreement of Mackerel	1999	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Management of Mackerel Norway, EU and the Faro Island had a management agreement from 1999 – 2000. In 2010 the coastal states could not agree anymore and in the period of 2010 -2014 the met over 20 times trying to agree about a new agreement concerning the management of Mackerel. The reason was that the Faroes wants a larger share of the TAC and Iceland made a claim for coastal states share of Mackerel. In March 2014 EU, Norway and Faro Island signed an agreement valid for 5 years where mutual access to each other's fishing zones is included. EU, Norway and Faro Island managed to agree in regards to management both in 2015 and 2016. Norwegian quota is 201 633 tons (26,67%).	X

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
Management of redfish		○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	Management of redfish There are several species of redfish in the North East Atlantic ocean. The populations with gratest commercial interest is the population of deep sea redfish situated in Irminger Sea, Barents Sea and the Norwegian Sea. In 2005 a new fishery for deep sea redfish started and the populations are exploited by several states (Norway, Russia, Greenland and Iceland). According to NEAFC Norway has the right to fish 74% of the TAC in the Barents Sea and Norwegian Sea and 3,85 % in the Irminger Sea.	X

47. Please list the priority needs regarding collaboration on conservation and sustainable use of aquatic genetic resources of farmed aquatic species and their wild relatives. Are they being addressed, i.e. are there any critical gaps?

Collaboration is needed in order to ...	Rank 1=Very Important 10=No importance	To what extent are the needs being met	Comments ***For example any critical gaps***
Improve information technology and database management	2	(●) To a great extent ( ) To some extent ( ) None ( ) Unknown	International cooperation in this area is ensured, for example, through cooperation with the ICES
Improve basic knowledge on aquatic genetic resources	2	( ) To a great extent (●) To some extent ( ) None ( ) Unknown	
Improve capacities for characterization and monitoring of aquatic genetic resources	3	( ) To a great extent (●) To some extent ( ) None ( ) Unknown	
Improve capacities for genetic improvement	1	( ) To a great extent (●) To some extent ( ) None ( ) Unknown	
Improve capacities for economic valuation of aquatic genetic resources	1	( ) To a great extent ( ) To some extent (●) None ( ) Unknown	
Improve capacities for conservation of aquatic genetic resources	2	( ) To a great extent (●) To some extent ( ) None ( ) Unknown	
Improve communication on aquatic genetic resources	3	( ) To a great extent (●) To some extent ( ) None ( ) Unknown	

Collaboration is needed in order to ...	Rank 1=Very Important 10=No importance	To what extent are the needs being met	Comments ***For example any critical gaps***
To improve access to and distribution of aquatic genetic resources	9	(●) To a great extent ( ) To some extent ( ) None ( ) Unknown	
Other **Continue adding row as necessary** Add Row / Remove Row		( ) To a great extent ( ) To some extent ( ) None ( ) Unknown	

48. Please describe the types of collaboration that have been most beneficial for your country, and why?

The cod in the Barents Sea is the commercial most important fish population Norway for Norway, in 2015 the value of the Norwegian part of the TAC was 6 billion NOK. Norway and Russia will look more closely at the Norwegian and Russian fisheries legislation on discards, and make efforts to create common guidelines for inspection of fishing vessels in the Barents Sea and the Norwegian Sea in 2016.

International Cooperation to Sequence the Atlantic Salmon Genome (ICSASG). The Atlantic salmon as a species is an integral part of the social and economic fabric of many coastal countries worldwide. A better scientific understanding of this species and its genome is critical to enhancing the growth and management of this global resource, and salmonids in general, with sustainability.

The ICSASG was established in 2009 to oversee and provide funding for the effort to sequence the genome of Atlantic salmon. The ICSASG is comprised of public and private member organizations and aquaculture industries from Canada, Chile and Norway.

The goal of the ICSASG collaboration has been to produce a genome sequence that:
1.Identifies and physically maps all of the genes in the Atlantic salmon genome
2.Acts as a reference sequence for the genomes of other salmonids (e.g., Pacific salmon and rainbow trout) and more distantly related fish (e.g., smelt and pike)

The International Cooperation to Sequence the Atlantic Salmon Genome (ICSASG) is supported by the following organizations:
1.Research Council of Norway (RCN)
2.Norwegian Seafood Research Fund-FHF -
3.Genome BC
4.The Chilean Economic Development Agency – CORFO and InnovaChile Committee

49. Is there a need for your country to expand its collaboration concerning the conservation, sustainable use and development of aquatic genetic resources? If yes, give details, including any requirements for capacity strengthening in box below

- (●) Yes
- ( ) No

If yes, please give details

It is always a need to increase collaboration between Norway and other states with regards to fisheries and aquaculture to ensure sustainable management of AqGr. Norway share up to 90% of our wild resources with other countries and cross-border cooperation is essential.

50. Describe important roles that your country performs within its region (and/or sub-region) and globally in terms of being a keeper, user and sharer of aquatic genetic resources.

IUU fishing occurs both within areas under national jurisdiction and on the high seas. Despite the efforts by global organisations, regional bodies and States, IUU fishing persists and is in some areas increasing. Fighting IUU fishing is of the highest priority to Norway, and Norway has been an active contributor both in global and regional bodies.

The failure of States to effectively control the fishing operations of vessels flying their flags is the core of the problem of IUU fishing. Reliance on the implementation of flag State duties to prevent IUU fishing has proved to be insufficient, and enhanced port State control is now consideredcrucial in combating IUU fishing.

Prolonged IUU (Illegal, Unreported and Unregulated) fishing has led to significant overfishing of cod and other commercial stocks in the Barents Sea. For several years, IUU catches of North East Atlantic Cod surpassed 100,000 tonnes. Active steps have been taken to reduce this overfishing. In this work, the Norwegian fisheries authorities have collaborated with the inspection authorities in a number of other countries and international organizations. In 2010 Norwegian and Russian control authorities jointly concluded that no overfishing had been identified for the year 2009.

The decline in overfishing in the Barents Sea is the direct result of a number of concrete measures: a continual long-term focus on the part of the Norwegian inspection authorities bilateral collaboration with other countries the introduction of port State control in the Northeast Atlantic Fisheries Commission (NEAFC) area from 1 May 2007. Since the introduction of the port State control regime, there has been a marked reduction in illegal landings in the NEAFC area.

In order to spread the effective measures against overfishing on a global scale, Norway has initiated the establishment

of regional schemes on port control in RFMOs Norway is party to, and has championed the development of a global, binding instrument, which was adopted by Food and Agriculture Organization (FAO) in 2009.

In order to address the problem of IUU fishing, most regional fisheries management organizations blacklist IUU vessels. These schemes imply that procedures are agreed upon for the establishment and maintenance of lists of fishing vessels (IUU Vessel list) found to have engaged in fishing activities in a manner, which has diminished the effectiveness of conservation and management measures.

Agreement has been reached on a number of appropriate domestic actions against vessels appearing on the IUU Vessel list, such as the refusal of the granting of their flag and not authorizing landing or transshipments in ports.

Nomally it is the IUU vessel itself (the physical vessel) which is denied such rights, also when operated by others than those who participated in the fishing. The Norwegian approach implies that all blacklisted vessels are perpetually prohibited from fishing in the Norwegian EEZ and will not be entitled to fly the Norwegian flag, irrespective of changes in ownership.

Norway also favours other means of combating IUU fishing, such as mandatory use of vessel monitoring systems (VMS), improved and more comprehensive reporting requirements, trade- and marked related measures in accordance with WTO regulations as well as increased focus on the responsibility of nationals involved in IUU fishing.

Submit Form