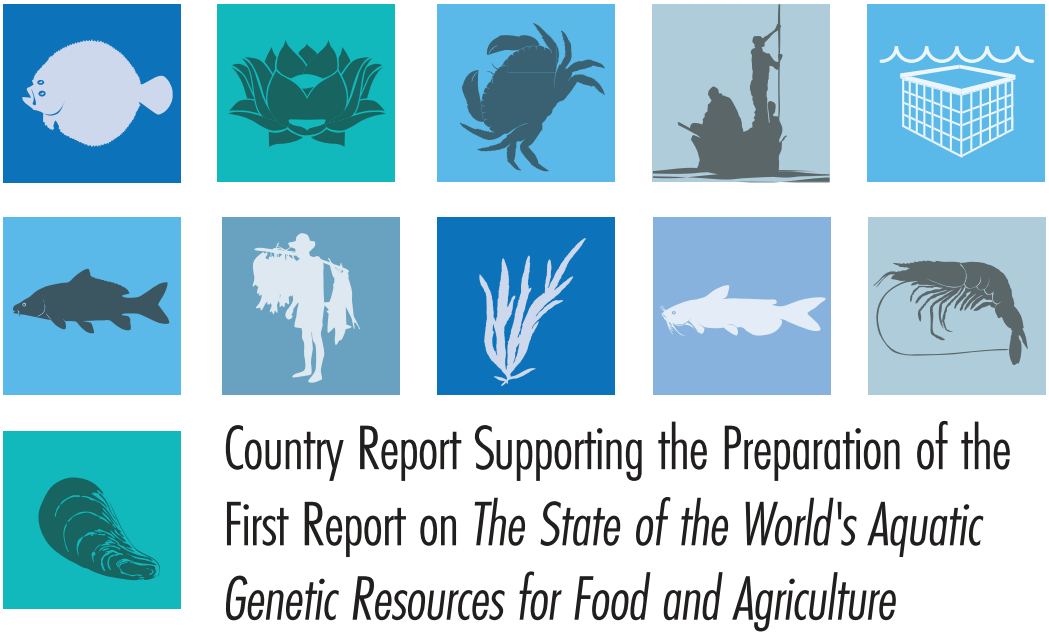
Food and Agriculture Organization of the United Nations

COUNTRY REPORTS

Ukraine



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	Ukraine
Prepared By	VITALIY BEKH
Date	Nov 30, 2015

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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.

The water area used in a varying degree for fish rearing in today's Ukraine is 1,500,000 ha (including the Dnieper reservoirs, lakes and estuaries where culture-based fisheries is developed). The pond surface is about 180,000 ha, whereof the growout area of specialized fish farms constitutes about 50,000 ha.

The main reared species are common carp and its different breeds, silver carp, bighead carp and their commercial hybrids, grass carp, goldfish and, in insignificant quantities, sturgeons, rainbow trout, Mississippi paddlefish, Northern pike, wels catfish, pike-perch and tench.

The dominant technologies are extensive and semi-intensive pond rearing of common carp in polyculture with herbivorous fishes using processing wastes of cereal crops for additional feeding. The fish productivity of growout ponds does not exceed 1 tonne per hectare. Mariculture is practically undeveloped. A quite active development of industrial tank and cage aquaculture and the use of recirculating aquaculture systems (RAS) for fish rearing has started in the last ten years.

The following main trends are recognizable in the current aquaculture of Ukraine:

• the traditional pond fish farming is in a state of stagnation, the production of common carp (partly goldfish) and herbivorous fishes has been on the same level with minor fluctuations in the last decade. The total volume of pond-reared fish varies around 25,000 tonnes and no major changes are expected in this sector in the coming years. The production of additional fish species of the traditional pond culture (wels catfish, Northern pike, pike-perch, tench, Mississippi paddlefish) grows a little each year, but their total share does not exceed 1 percent;

• trout culture is growing quite quickly, but its limiting factors are the low purchasing power of the population, the high price of high-quality imported feeds (including the 10 percent import duty) and the insufficient quantity of water sources suitable for the rearing of salmonids. According to official statistics, the trout production of Ukraine was 264 tonnes in 2012, but according to indirect data (import of specialized trout feeds) it is over 1000 tonnes;

• sturgeon culture is actively developed in RAS, cages and tanks, as the fishing of these species in the basin of the Black and Azov seas was completely banned in 2000. Among its limiting factors, the following can be highlighted: the low purchasing power of the population, the high price of high-quality imported feeds, the insufficient quantity of sexually mature broodfish and the quite complex technology of rearing, egg stripping and fry nursing. According to official statistics, the sturgeon production of Ukraine was 54 tonnes in 2012, while according to indirect data, it is more than 200 tonnes. In general, the market potential of sturgeons is considerable in Ukraine;

• the rearing volume of exotic and non-traditional fish species is insignificant and has an unpredictable character, such as the rearing of whitefishes or North African catfish. Statistical data on these species are missing, but they are actually present in Ukraine.

In spite of the sufficiently high per capita fish consumption and the stable market demand, the aquaculture and commercial fisheries of Ukraine are in a permanent crisis. The aquatic genetic resources are under a continuous pressure because of the high level of IUU fisheries, and the statistical information is unreliable and only partly reflects their actual status.

The situation of high-value sturgeon species is especially alarming. The natural populations of sterlet sturgeon, Danube sturgeon, beluga and starry sturgeon are maintained practically exclusively by artificial reproduction. Valuable indigenous sturgeon species such as Atlantic sturgeon and ship sturgeon have disappeared from the fish fauna of Ukraine.

The aquatic genetic resources of common carp and herbivorous fishes suffer from uncontrolled hybridization, the lack of breeding work and the introduction of genetic material of unknown origin from abroad.

The main driving forces that significantly affect and will affect the Ukrainian aquaculture development in general, are the following:

• growing income of the population, which increases the demand for more valuable and expensive fish and fish products and changes the traditions of fish consumption, while the huge differences in the population's income bring about a significant diversification of the market in general;

• the low level of interaction between the state, private and civil sectors in the management of aquatic genetic resources leads to their irrational and unsustainable use.

There are two state programmes of high importance in Ukraine, which allow for the provision of budgetary financing from the State Fisheries Agency of Ukraine. These are the Selective Breeding Programme directed towards the supporting of maintaining, purchasing and development of fish broodstocks for further rearing and the Reproduction Programme directed towards the restocking of natural waters and the preservation of commercial fish stocks (mainly in the Dnieper reservoirs, the Azov and Black seas).

The in situ and ex situ conservation of genetic resources in Ukraine are done partly through aquaculture; live and frozen gene banks have been established at research institutes.

Scientific support to the sector is provided by several research institutes, while the training of the personnel is done by a number of agricultural universities.

Ukraine is a signatory to several agreements and conventions on biodiversity conservation, including that of aquatic genetic resources. The most important of these is the Convention on International Trade in Endangered Species of Wild Fauna and

Flora (CITES).
The successful preservation and sustainable development of the national aquatic genetic resources in the future require a significant increase in the quantity of fish seed released into natural waters and the establishment of captive-reared broodstocks of high-value living aquatic resources taking into account all their genetic variability. This especially applies to indigenous sturgeon species.

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

Ukraine is the largest country of Europe by area (603,700 km2) having a population of 45,300,000 people (as of 1 December 2013) (www.ukrstat.gov.ua). The climate of Ukraine is moderate, with quite hot summers and relatively cold winters. The relief of the country is mainly flat, there are low mountains with a maxumum altitude of 2061 m above sea level (mt. Hoverla). On the south, the shores of Ukraine are washed by the Black and Azov seas. The annual distribution of precipitation is quite homogeneous, its annual quantity ranges between 200 mm and 1500 mm. In the last 10–15 years, a natural decrease of the population has been observed in the country, which is related to the low birth and high death rate, as well as a significant workforce migration to other countries due to the economic crisis. This trend is expected to continue: UN estimates that the population of Ukraine will fall to 35 million by 2050.
The urban population was 31,400,000 in 2012, which corresponds to 68.9 percent. The share of rural population was 31.1 percent. The ratio of urban to rural population is not homogeneous in the different regions of the country. The dominance of urban population is considerable in the industrial East and South of Ukraine, while in the western and central regions, the share of rural population increases to 44–48 percent. By sex ratio, women are traditionally dominant, making up 53.8 percent of the country's population.

The water area used in a varying degree for fish rearing in today's Ukraine is 1,500,000 ha (including the Dnieper reservoirs, lakes and estuaries where culture-based fisheries is developed). Of this, pond surface is about 180,000 ha, whereof the growout area of ponds in specialized fish farms constitutes about 50,000 ha. The main reared species are common carp and its different breeds, silver carp, bighead carp and their commercial hybrids, grass carp, goldfish and, in insignificant quantities, sturgeons, rainbow trout, Mississippi paddlefish, Northern pike, wels catfish, pike-perch and tench.
The dominant technology is semi-intensive pond rearing of common carp in polyculture with herbivorous fishes using processing wastes of cereal crops for additional feeding. The fish productivity of growout ponds does not exceed 1 tonne per hectare. Marine aquaculture is practically undeveloped. A quite active development of industrial aquaculture and the use of recirculating aquaculture systems for fish rearing has started in the last ten years.

The total Ukrainian catch of fish and other living aquatic resources was 203,906 tonnes in 2012, whereof the catch of finfish was 195,490 tonnes (www.ukrstat.gov.ua). The catch in the inland waters of the country was 41,569 tonnes (pond aquaculture + commercial fisheries, mainly in the reservoirs of the Dnieper), 63,454 tonnes were caught in the exclusive economic zone of Ukraine (Azov and Black seas), and 98,903 tonnes in the exclusive economic zones of other countries.

Among the main stakeholders participating in the process of fish rearing and processing, the following could be mentioned:
• fish farmers of specialized and non-specialized fish farms;
• representatives of state authorities (State Fisheries Agency of Ukraine and its territorial units – fishery inspection);
• staff of fish farmers' associations („Ukrrybkhoz" – Union of Fish Farms of Ukraine);
• staff involved in restocking of natural waters and fishing therein;
• researchers;
• staff involved in fish processing and trade (importers);
• the civil society.

The rearing of high-value salmonids and sturgeons started to recover in the last years, but is still at a quite low level. According to official statistics, 51 tonnes of sturgeons and 254 tonnes of rainbow trout were produced in Ukraine in 2012, while the total production of aquaculture (i.e. in ponds) was 22,500 tonnes in the same year. About 50 percent of pond-reared fish are silver carp and bighead carp, which play an important part in the diet of the most vulnerable poorest part of the population.

Virtually all principal aquaculture-reared fish species are introduced, with the exception of common carp, Northern pike, wels catfish, tench and the indigenous sturgeon and mullet species.

The Ukrainian population traditionally consumes quite a high quantity of fish and fish products and thus, the sector is highly competitive in relation to other agricultural sectors. The per capita consumption was 17.5 kg/year in 1990, then it sharply fell

to 3.5 kg/year (1994) because of the decrease of the catches of the oceanic fleet and the diminishing of aquaculture production. Thereafter, the consumption of fish and fish products has increased in relation to their imports, which have been at the level of 500,000–600,000 tonnes in the recent years. According to official statistics, the per capita fish consumption was 13.6 kg/year in 2012 (www.ukrstat.gov.ua), but the actual value is significantly higher as there is no reliable information either on commercial catches or on aquaculture.

The lack of reliable statistics on fish rearing in Ukraine especially concerns the production of valuable and expensive fish: rainbow trout and sturgeons. Indirect estimates of rearing volumes, e.g. on the basis of the quantity of imported trout feeds, indicate that the real figures of rainbow trout production are 3 to 4 times higher than the official ones.

In relation to aquatic genetic resources, there are two state programmes in Ukraine, which allow for the provision of budgetary financing from the State Fisheries Agency of Ukraine. These are the Selective Breeding Programme directed towards the supporting of maintaining and purchasing fish broodstocks for further rearing and the Reproduction Programme directed towards the restocking of natural waters (mainly the Dnieper reservoirs, the Azov and Black seas).
In the last three years (2011–2013), the budgetary state financing of the above programmes was 10,500,000 USD. Fifty-two million different-age fry and fingerlings of high-value fishes have been released into natural waters, whereof Danube sturgeon and sterlet sturgeon made up 3.7 million.
In addition, restocking of valuable commercial fish species, i.e. in situ conservation of living aquatic resources, is done by four state fish restocking centres, whose entire activity is directed towards the restocking of natural water bodies. It should be noted that they are managed by the State Fisheries Agency of Ukraine and are budgetary enterprises, i.e. they may not be involved in any commercial activity.
The selective breeding work in the animal husbandry of Ukraine, including aquaculture, is done on the basis of state licences. Farms wishing to be involved in selective breeding work must receive state recognition as a pedigree restocking centre, a pedigree hatchery or a selective breeding centre. As of 2013, there are 24 pedigree restocking centres, 88 pedigree hatcheries and 4 selective breeding centres for fish farming in Ukraine. These farms keep and rear over 40,000 breeders of all cultured fish species.

The fisheries sector of Ukraine has some conflicts with other sectors of the national economy. The most acute conflicts are with hydropower-producing and irrigation sectors which often lead to mortality of fish or significantly worsen the conditions of its spawning and migration.

The successful preservation and sustainable development of the national aquatic genetic resources in the future require a significant increase in the quantity of fish seed released into natural waters and the establishment of captive-reared broodstocks of high-value living aquatic resources taking into account all their genetic variability. This especially applies to indigenous sturgeon species.

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.

The identification and nomenclature of the cultured fish species, varieties and hybrids are often problematic. E.g., the broodstocks of silver and bighead carps are hybridized to a significant extent and consist of various hybrid forms. Several commercial sturgeon hybrids have appeared in the recent years, and the possibility of their escaping to natural waters worries both scientists and the general public. Modern DNA-technologies are expected to play an important role in the identification of these hybrids. Another problem is the thoughtless commercial hybridization of different domesticated breeds of common carp and the Amur wild carp (sazan), which has led to a virtually complete disappearance of genetically clean populations of European sazan – the wild ancestor of the cultured common carp.

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.

Recent genetic data are only poorly taken into account during management decisions on restocking and stock rehabilitation in natural waters. The situation is similar in the commercial production of hybrids of sturgeon or other fishes, too.

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.

In the past, broodfish of herbivorous fishes, pike, wels catfish and sturgeons were often caught in natural waters for further artificial propagation and seed production but, in the recent years, this practice has been gradually given up in favour of rearing broodstocks in captivity.

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** 90
- Percent managed by private sector**.** **Please Enter Percentage Here** 5
- Percent managed by private /public partnership. **Please Enter Percentage Here** 5

Total 100

Please add any explanation here.

Programmes of selective breeding and genetic improvement of cultured fish species are done only from state financing by state research institutes and organizations.

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*	
Cyprinus carpio	☒ Traditional selective breeding		☐ Private Sector ☒ Public Sector ☐ Private/Public partnership	X
	☒ Hybrids	Specify parental species in the box below: Cyprinus carpio carpio X Cyprinus carpio haematopterus	☒ Private Sector ☒ Public Sector ☐ Private/Public partnership	
	☐ Triploids and other polyploids		☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Mono-sex production		☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other		☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Hypophthalmichthys molitrix	☐ Traditional selective breeding		☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	X
	☒ Hybrids	Specify parental species in the box below: Hypophthalmichthys molitrix X Hypophthalmichthys nobilis	☒ Private Sector ☒ Public Sector ☒ Private/Public partnership	
	☐ Triploids and other polyploids		☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ 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	Specify parental species in the box below Acipenser ruthenus X Huso huso	☒ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Acipenser ruthenus	☐ 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	Specify parental species in the box below Acipenser baerii x A gueldenstaedtii, and Acipenser baerii x A ruthenus	☒ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Acipenser baerii	☐ 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	Specify parental species in the box below Acipenser ruthenus X Huso huso	☒ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Huso huso	☐ 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 Astacus leptodactylus	☒ 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 Macrobrachium rosenbergii	☒ 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 galloprovincialis	☒ 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 Huso huso	☒ 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)	- used mainly for hybridization with Acipenser ruthenus (sterlet sturgeon) - development of a method for obtaining ovulated eggs for human consumption from live breeders - development of a rearing technology in RAS and maintaining a live mature broodstock of sufficient size - maintaining a live mature broodstock of sufficient size in captivity	X
◉ Native ○ Introduced Acipenser ruthenus	☒ 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)	- development of a method for obtaining ovulated eggs for human consumption from live breeders - development of a rearing technology in RAS and maintaining a live mature broodstock of sufficient size - maintaining a live mature broodstock of sufficient size in captivity - used for hybridization with Huso huso	X

◉ Native ○ Introduced Acipenser ruthenus X Huso huso	☐ 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 Acipenser gueldenstaedtii	☒ 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 Acipenser stellatus	☒ 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 Acipenser baerii	☒ 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)	- development of a rearing technology in RAS - used for hybridization with different sturgeon species	X

○ Native ◉ Introduced Polyodon spathula	☒ 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)	- maintaining a live mature broodstock of sufficient size in captivity - development of a reliable hatchery technology - establishment of a broodstock of sufficient size	X
○ Native ◉ Introduced Ictiobus spp	☒ 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 Cyprinus carpio	☐ 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)	Methods: mass and individual selection. Results: increasing of growth rate and fecundity. Current and planned R&D: sperm cryopreservation, control of breed standards, maintaining breed characteristics and productivity. There are several strains 1. Bekh V., Hrytsynyak I. 2008. Carp Breeds of Ukraine. In Catalogue of Carp Breeds (Cyprinus carpio L.) of the Countries of Central and Eastern Europe, 146-160.	X
○ Native ◉ Introduced Cyprinus carpio haematopterus	☐ 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 Carassius auratus	☒ 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 Tinca tinca	☒ 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 Hypophthalmichthys molitrix	☒ 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)	- a problem of preserving pure-blooded broodstocks exists - there is a possibility of distinguishing between hybrids by the albumin's gene (Katasonov and Gomelskiy, 1991)	X
○ Native ◉ Introduced Hypophthalmichthys nobilis	☒ 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)	- a problem of preserving pure-blooded broodstocks exists - there is a possibility of distinguishing between hybrids by the albumin's gene (Katasonov and Gomelskiy, 1991)	X

○ Native ◉ Introduced Ctenopharyngodon idellus	☒ 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 Clarias gariepinus	☒ 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 Ictalurus punctatus	☒ 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)	Methods: Mass and individual selection. Hormonal sex reversal. Results: increasing of growth rate, forming all-female broodstock with sex-reversed males R&D – gynogenesis - hormonal sex reversal - forming all-female broodstock - mass selection for different spawning time during the reproductive season	X

◉ Native ○ Introduced Sander lucioperca	☒ 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 Mugil soiuy	☒ 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 Huso huso X Acipenser ruthenus	☐ 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

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***	
Psetta maxima	(•) Yes ( ) No ( ) Not Known		X
Sander lucioperca	(•) Yes ( ) No ( ) Not Known		X
Mylopharyngodon piceus	( ) Yes (•) No ( ) Not Known		X

Polyodon spathula	◯ Yes ◉ No ◯ Not Known	Alexander M. Tretyak, Alexander E. Onuchenko, Bogdan A. Gankevich. Results of paddlefish (Polyodon spathula (Walbaum)) cultivation in central and northern regions of Ukraine // International scientific conference “Actual status and active protection fish populations endangered by extinction”. — Olsztyn, 2008. — P. 259–262.	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***	
Acipenser baerii	☒ 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	Norway Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Qatar Republic of Korea Republic of Moldova Romania Russian Federation Rwanda	establishment of a broodstock	X
Polyodon spathula	☒ 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	Norway Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Qatar Republic of Korea Republic of Moldova Romania Russian Federation Rwanda	establishment of a broodstock	X

Oncorhynchus mykiss	☐ 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	Cambodia Cameroon Canada Central African Repub Chad Chile China Colombia Comoros Cook Islands Costa Rica Côte d'Ivoire Croatia Cuba Cyprus Czech Republic Republic of Korea Democratic Republic Denmark Djibouti	establishment of a broodstock . Mass and individual selection. Hormonal sex reversal. Results: increasing of growth rate, forming all-female broodstock with sex-reversed males R&D – gynogenesis - hormonal sex reversal - forming all-female broodstock - mass selection for different spawning time during the reproductive season	X
Coregonus peled	☐ 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	Norway Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Qatar Republic of Korea Republic of Moldova Romania Russian Federation Rwanda	establishment of a broodstock	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	
Thymallus thymallus	☒ Capture fisheries ☒ Recreational fishery ☐ Aquaria ☐ Biological control ☒ Research and develpment ☐ Other (specify in comments)	In Red Book, fisheries not allowed, for artificial reproduction only.	X
Hucho hucho	☐ Capture fisheries ☒ Recreational fishery ☐ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)	In Red Book, fisheries not allowed, for artificial reproduction only. Decreasing, loss of habitat because of unreasonable lumbering and erosion	X
Salmo trutta morpha fario	☐ Capture fisheries ☒ Recreational fishery ☐ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)	Recreational and commercial fishing not allowed, restocking program	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***	
Acipenser ruthenus	☒ Import ☐ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☐ Living specimens ☐ Other	Niue Norway Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland Portugal Qatar Republic of Korea Republic of Moldova Romania	not legal	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)***	
Astacus leptodactylus	☐ 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	
Mytilus galloprovincialis	☐ 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
Huso huso	☐ 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	
Acipenser ruthenus	☐ 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
Acipenser gueldenstaedtii	☐ 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	
Cyprinus carpio	☐ 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
Tinca tinca	☐ 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	
Carassius auratus	☐ 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
Hypophthalmichthys molitrix	☐ 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	
Hypophthalmichthys molitrix	☐ 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
Silurus glanis	☐ 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	
Esox lucius	☐ 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
Salmo trutta morpha fario	☐ 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	
Hucho hucho	☐ 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
Thymallus thymallus	☐ 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	
Sander lucioperca	☐ 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
Mugil soiuy	☐ 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	
Mugil cephalus	☐ 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	not concern Ukraine at all, because the Ukrainian population is stably decreasing in the last decades and the forecast is not positive.
Increased wealth and demand for fish	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	concerns Ukraine very much. Despite the low standards of life and the low per capita income, the level of fish consumption is rather high and Ukrainians have strong traditions of fish consumption.
Governance (ability of government, industry and the public to work together in managing resources)	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	partly concerns Ukraine. The potential ability of public, private and civil society to act collectively and holistically in Ukraine is at a middle level. There is specific legislation in the country but it is not stable and very often stakeholders do not strictly follow it.
Climate change	◯ Strongly positive ◯ Positive ◯ Negative ◯ Strongly negative ◉ No effect ◯ Unknown	not concern Ukraine too much, especially in the field of aquaculture. In some places, floods or droughts occur episodically, but they do not have strong consequences for aquaculture
Competition for resources, especially freshwater	◯ Strongly positive ◯ Positive ◉ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	partly concerns Ukraine. Competition for resources exists in commercial fisheries, but it is not strong in the field of aquaculture.

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Changes in values and ethics of consumers	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	concerns Ukraine. Many people change their customs and turn to non-traditional fish species and aquaculture products (e.g. shrimp, salmon, pangas catfish and tilapia). Consumers are beginning to prefer processed fish products (e.g. sushi, smoked and dried fish, filleted fish or surimi) instead of traditional live fish.
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	not concern Ukraine
Increased wealth and demand for fish	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	High level of and increasing UUI Fisheries
Governance (ability of government, industry and the public to work together in managing resources)	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	- but low ability all stakeholders to manage together. In spite of the existence of special programmes for the restoration of stocks of valuable commercial species, special protection measures and state support for maintaining broodstocks in fish farms of the country, their efficiency is often low because of the incompetency and the lack of consistency in management decisions. The annual stocking of fry of herbivorous fishes into the reservoirs of the Dnieper and fry of sturgeons into the Dnieper-Bug estuary can be noted as positive moments, but the effectiveness of these stocking events is often poor.
Climate change	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	- some problems with increasing of arid climate (temperature too) and improvement of conditions for invasive species
Competition for resources, especially freshwater	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	- irrigation, elimination of wetlands, hydropower plant constractions have strong impact for freshwater resources. The significant hydraulic constructions realized in the last century on the territory of Ukraine largely affected the natural stocks of valuable diadromous fish species. The negative impact was the largest for sturgeons whose stocks have significantly decreased and are currently maintained only through artificial propagation.

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Changes in values and ethics of consumers	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	wild relatives of farmed aquatic species in nature have been less impacted because of consumer demand is changing to import species (shrimp, salmon). Tradutional species – live common carp and herbivorous fishes – are replaced by more valuable sturgeon species, rainbow trout, channel catfish, river crayfish, and processed fish products: sushi and surimi.
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

The countermeasures for decreasing the impact of negative factors on the genetic resources of indigenous fish species in natural waters are the following:
- improvement of the protection of aquatic resources and decreasing the share of IUU fishing;
- increasing the market availability of valuable commercial species through their rearing in aquaculture;
- increasing commercial stocks through rational and ecologically balanced restocking of aquaculture-reared fry of valuable fish species into natural waters
-

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	Cyprinus carpio 1. Bekh V., Hrytsynyak I. 2008. Carp Breeds of Ukraine. In Catalogue of Carp Breeds (Cyprinus carpio L.) of the Countries of Central and Eastern Europe, 146-160.
Hybridization	○ Not at all ○ To a minor extent ◉ To some extent ○ To a great extent	Hypophthalmichthys nobilis X H. molitrix, H.molitrix X H. nobilis, Hybrids Acipenser ruthenus X Huso huso Huso huso X Acipenser ruthenus, hybrid (Bester, бестер) Katasonov V. Ya. 1991. Fish selection with basics of genetics (Селекция рыб с основами генетики). V. Ya. Katasonov, B. I. Gomelskiy. Moscow, Agropromizdat, 208 pp. (In Russian)
Polyploidy (chromosome set manipulation)	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	
Monosex production	○ Not at all ◉ To a minor extent ○ To some extent ○ To a great extent	Oncorhynchus mykiss just import from Western Europe, some R&D
Marker assisted selection	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	
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	The significant hydraulic constructions realized in the last century on the territory of Ukraine largely affected the natural stocks of valuable diadromous fish species. The negative impact was the largest for sturgeons whose stocks have significantly decreased and are currently maintained only through artificial propagation. Virtually all principal spawning areas of sturgeons in the Dnieper river were completely cut away from their feeding areas in the estuaries and the Azov-Black Sea shelf. On the other hand, this created favourable conditions for the artificial stocking and fattening of herbivorous fishes, freshwater bream, partly pike-perch and wels catfish, especially in the reservoirs of the Dnieper river.
Pollution of waters	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	The pollution of surface waters has recently decreased somewhat in Ukraine because of the decreased industrial production. However, significant areas of the country remain affected by increased radiation caused by the Chernobyl disaster. In the Carpathian Region, there is significant soil and river valley erosion because of illegal and irrational logging, which negatively affects the stocks of valuable salmonid species (brown trout, grayling, huchen).
Increased frequency of extreme climatic events and long-term climate change	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Extreme natural phenomena (floods, droughts, high and low temperatures) affect the Ukrainian aquaculture sector to an insignificant extent. Among these factors, the most important are the periodic floods that may locally harm fisheries and aquaculture in snowy and rainy years. Farms in the western part of Ukraine, mostly in the Carpathian Region, suffer the most from floods. In contrast, the farms of East and Central Ukraine periodically suffer from water shortage and the impossibility of filling up their ponds because of the low water level in the small rivers on which they are built, as well as the high evaporation and infiltration.
Establishment of invasive species	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Among aquaculture-related invasive species, the most widespread are the goldfish (Carassius auratus) and the topmouth gudgeon (Pseudorasbora parva). While goldfish is partly reared as a target species of aquaculture, topmouth gudgeon is, without doubt, an invasive species accidentally introduced to Ukraine during the mass introduction of herbivorous fishes from the Far East in the 1950s. Among the other invasive species present in Ukraine, the Amur sleeper (Perccottus glehni), the pumpkinseed sunfish (Lepomis gibbosus), and the brown bullhead (Ictalurus nebulosus) deserve to be mentioned.

Drivers that are changing aquatic ecosystems	Effect on AqGR ***mark appropriate box***	Countermeasures and effects
Introductions of parasites and pathogens	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	In the former Soviet Union, acclimatization work in fisheries was done on a wide scale. In particular, the introduction of herbivorous fishes (silver carp, bighead carp, grass carp) started in 1953 and was related to the widespread introduction of artificial propagation and the broadening of the species spectrum of pond polyculture. Rainbow trout, channel catfish, North African catfish, bigmouth buffalo, whitefishes, Siberian sturgeon, Mississippi paddlefish and so-iuy mullet are the main introduced species that are widely cultured in Ukraine. The introduced species have a specific parasite faune, but it does not affect significantly the local fish fauna and the technological processes of aquaculture. The Koi Herpes Virus (KHV), a dangerous infectious disease of common carp, has not yet been registered in Ukraine.
Impacts of purposeful stocking and escapes from aquaculture	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	The wide introduction of herbivorous fishes into the large reservoirs of the country does not have a visible influence on the indigenous fish fauna, as the stocking levels are not very high. In addition, these fish are unable to reproduce on their own in the climatic and hydrological conditions of Ukraine. The acclimatization of the Far Eastern so-iuy mullet (Mugil soiuy) was successful and now it is one of the dominant mass species of the Azov and Black seas, which is under a significant fisheries pressure and is able to actively reproduce. Such fish species as the rainbow trout, channel catfish, bigmouth buffalo, Mississippi paddlefish, Siberian sturgeon or whitefishes are under a significant fisheries pressure outside of fish farms and do not form stable populations in natural water bodies.
Capture fisheries	○ Strongly positive ○ Positive ○ Negative ◉ Strongly negative ○ No effect ○ Unknown	Commercial fisheries have significantly modified the genetic structure of populations and stocks of some indigenous fish species. Sturgeons were affected especially strongly, in particular, their migration reflexes were lost or significantly reduced. On the other hand, the uncontrolled introduction of sturgeons belonging to other species and populations (Siberian sturgeon, sterlet sturgeon from the Volga and Danube sturgeon from the Volga) for aquaculture purposes also results in a biological pollution of native populations.
Other ***Continue listing other driverst***	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	
Add Row / Remove Row		

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

Among species represented in aquaculture and having wild relatives in natural conditions, sturgeons must be mentioned in the first place. Their fishing is currently banned (since 2000), which is controlled by territorial bodies of the State Fisheries Agency (fish incpection). There is also a state-financed special programme for the restoration of the stocks of valuable commercial fish species in their natural habitats. Of the aquaculture-reared species, the populations of wild relatives of herbivorous species, Northern pike, wels catfish, pike-perch, mullets and turbot are restocked. The volumes of these restockings are insufficient and their effectiveness is often low because of a number of reasons

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

• limited of stocked volume; high level UUI Fisheries

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

It is concern mostly Sturgeon and Salmonids species,
As regards other valuable species (indigenous mullets, turbot, huchen, grayling, brown trout, partly Northern pike, wels catfish, pike-perch and tench), the development of their aquaculture broodstocks is in progress in the country, but their share in production or in fry rearing for restocking of natural waters is still insignificant. There are some state restocking centres in the country, whose activity is directed towards the restoration of natural stocks of the above fish species. These include the following:
• „Academician S. T. Artyushchik" Production and Experimental Sturgeon Restocking Centre of the River Dnieper – rears fry of sterlet sturgeon and Danube sturgeon;
• Nova Kakhovka State Production and Experimental Restocking Centre for Fry Rearing of Non-Noble Fishes – rears the fry of herbivorous fishes, common carp, Northern pike, wels catfish, pike-perch and tench;
• Kherson Production and Experimental Restocking Centre for Rearing of Non-Noble Fishes – rears the fry of herbivorous fishes and common carp;
• „Lopushno" Trout Restocking Centre – rears the fry of rainbow and brown trout.
In situ protection measures should include:
• the protection of wintering and spawning sites of the fish;
• the establishment of ichthyological reserves with year-round prohibition of fishing;
• scientifically based limitation of the catches;
• strictly following the rules of commercial and recreational fishing;
• implementation of conservation measures during all stages of hydraulic construction, irrigation and melioration;
• avoiding water pollution and eutrophication.

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	10
Maintain good strains for aquaculture production	8
Meet consumer and market demands	8
To help adapt to impacts of climate change	3
Future breed improvement in aquaculture	8
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

Efficiency is very low, high level of UUI Fisheries

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

collectors of wild seed and brood stock for aquaculture practically are not existed in the country

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

but managed capture fisheries are not well

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***	
Danube Biosphere Reserve	( ) Very effective (•) Somewhat effective ( ) Not effective ( ) Unknown	Practically no analysis of the efficiency of fish inspection measures is done in the protected areas or, when such data are available, they are limited and unreliable.	X
36 ichthyological wildlife areas	( ) Very effective (•) Somewhat effective ( ) Not effective ( ) Unknown	Practically no analysis of the efficiency of fish inspection measures is done in the protected areas or, when such data are available, they are limited and unreliable.	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***	
Huso huso	☒ Direct human consumption ☐ Live feed organism ☐ Other	◉ Yes ○ No ○ Unknown	All Sturgeon species are included in CITES list, broodstock material is very poor	X
Acipenser ruthenus	☒ Direct human consumption ☐ Live feed organism ☐ Other	◉ Yes ○ No ○ Unknown	All Sturgeon species are included in CITES list, broodstock material is in good conditions	X
Acipenser gueldenstaedtii	☒ Direct human consumption ☐ Live feed organism ☐ Other	◉ Yes ○ No ○ Unknown	All Sturgeon species are included in CITES list, broodstock material is poor	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***	
Acipenser stellatus	☒ Direct human consumption ☐ Live feed organism ☐ Other	◉ Yes ○ No ○ Unknown	All Sturgeon species are included in CITES list, broodstock material is very poor	X
Salmo trutta morpha fario	☐ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	It is not included to Ukrainian Red Book but stocking in natural waters is poor	X
Hucho hucho	☒ Direct human consumption ☐ Live feed organism ☐ Other	◉ Yes ○ No ○ Unknown	It is included to Ukrainian Red Book, stocking in natural waters is very poor	X
Thymallus thymallus	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	It is included to Ukrainian Red Book, stocking in natural waters is very poor	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***	
Cyprinus carpio	Institute of Fisheries	☒ 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	The cryopreservation of the sperm of valuable genotypes of fish, either reared in aquaculture or collected from the wild, is developed rather actively.	X
Acipenseridae	Institute of Cryobiology and Cryomedicine	☒ 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	There are three frozen gene banks in the country, containing the sperm of more than 30 fish species.	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	10
Maintain good strains for aquaculture production	8
Meet consumer and market demands	2
To help adapt to impacts of climate change	2
Future breed improvement in aquaculture	8
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	The main direction of their activity concerning genetic resources is the development and maintenance of broodstocks of valuable aquaculture species. As shown by the practice, this often happens haphazardly in Ukraine, without complying with the conservational, customs and veterinary legislation. For example, broodstocks of sturgeons and rainbow trout are developed from unknown sources, without any documentation of their origin. Yet, this also has positive aspects, as the most valuable sturgeon and salmonid species, which are often included in the Red Data Book, are preserved exactly due to aquaculture-reared collection or commercial stocks. This process could be significantly sped up if it were not for the problems related to customs and veterinary legislation and its practical applications.

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***
Fishers	☒ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	They are nominally interested in the preservation of aquatic genetic resources. In practice, because of their difficult economic situation or in pursue of individual profit, they are often involved in IUU fishing. In the future, a probable shift from commercial to recreational fisheries is expected, with an increasing responsibility of fishermen for the use of genetic resources.
Fish hatchery people	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☒ Research ☐ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Fish hatchery people in Ukraine mostly is a part of fish farmers who directly involves in aquaculture

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***
People involved in marketing	☐ Conservation ☐ Production ☒ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	People involved in marketing is represented by fish processors and traders. In general, they are interested in the preservation and development of living aquatic genetic resources. Cases are known when people involved in these fields invested directly in broodstock development and table fish production. Yet, importers lobby their own interests and are not interested in the development of domestic aquaculture
Government resource managers	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Nominally, state authorities are interested in the preservation and rational use of aquatic genetic resources. In fact, in spite of the existence of a national programme for the restocking of natural waters and the financial support of aquaculture broodstocks, this activity is ineffective. Restocking is often done with the wrong species, in the wrong time, in the wrong water bodies and not in the required quantities. The biological justifications on which the restockings are based are often ordered by the interested parties and do not fully reflect the real needs of the water bodies and their users. Very often their incompetence and personal interest in decision-making, this direction of state nature conservation activities remains inefficient.

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	The staff of fish farmers' associations, because of their low level of competence, practically do not influence the fisheries activities in the country, including the preservation and rational use of aquatic genetic resources. The increasing role of fish farmers' associations, their reforming and their growing activity in all areas of their competence is expected in the future.
Aquatic protected area managers	☒ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☐ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	In general, they are interested in the preservation of aquatic genetic resources but, because of their incompetence and corruption, their conservation activities remain inefficient
Policy Makers	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	In general, they are interested in the preservation of aquatic genetic resources but, because of their incompetence and corruption, their conservation activities remain inefficient

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	The civil society is interested in the preservation of aquatic genetic resources, establishment of aquaculture broodstocks, increasing the range and quality of food products. An exception to this is the opposition of anglers to limiting measures imposed for the protection of aquatic wildlife In the future, the role and significance of Non-Governmental Organizations will increase.
Intergovernmental Organizations	☒ Conservation ☒ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Ukraine actively participates in international cooperation on living aquatic resources.
Donors	☒ 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***
Consumers	☒ Conservation ☒ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Consumers prefer to buy legal production without GMO, also they prefer fish from wild (not from aquaculture), so these factors have different influence on whole fish market.

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

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

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***	
• the Act on Wildlife	13.12.2001	☐ Genes or molecules only ☐ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other	effectiveness is limited	X
• the Act on Breeding in Animal Husbandry	15.12.1993	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	effectiveness is limited	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***	
• the Act on the Red Data Book of Ukraine	07.02.2002	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	effectiveness is limited	X
• the Act on Aquaculture	18.09.2012	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	effectiveness is low	X
• the Act on Fisheries, Commercial Fishing and Protection of Living aquatic Resources	08.07.2011	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	effectiveness is low	X
• the Rules of Sport and Recreational Fisheries	15.02.1999	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☒ Importation ☐ Trade and commerce ☒ Access and benefit sharing ☐ Other	effectiveness is limited	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***	
• the Rules of Commercial Fisheries	18.03.1999	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☐ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	effectiveness is low, high level UUI Fisheries	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.

The national policy and regulations concetning the use of living aquatic resources in Ukraine have quite a long tradition and developed legislation. But the main problem is "Not following to them"

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	Ukraine restrict access for Sturgeons by Rules of Commercial Fisheries, Rules of Sport and Recreational Fisheries, the Act on the Red Data Book of Ukraine
Species	Ukraine restrict access for Sturgeons by Rules of Commercial Fisheries, Rules of Sport and Recreational Fisheries, the Act on the Red Data Book of Ukraine
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***	
Governmental initiative for acquisition of broodstock from native habitat (Chinese carps, American paddlefish)	☐ 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	In fact, not Apply in Ukraine
National laws of your country	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	yes, For example, if species is included in Red book, actually no chance to establish broodstock in legal way
National laws of donor country	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	
Internationl laws or protocols	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	concerning CITES species
Too expensive	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	concerning sturgeons species
Material transfer agreements required	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	yes, and custom and veterinary procedures
Knowledge gaps	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	
Public perception	☐ DNA ☐ Stock, breed or variety ☐ Species ☒ Other	yes, for not native species

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

Scientific services to aquaculture are provided by fisheries-oriented and other specialized research institutions, research enterprises and organizations and selective breeding centres, whose main tasks in the field of genetic resources are:

• elaborating the scientific bases of selective breeding work and the development and introduction of selective breeding results to aquaculture;

• development of efficient methods for the conservation of the gene pool and artificial propagation of rare and endangered species of living aquatic resources;

• improvement of the methods of low-temperature storage of the sexual products of cultured species using modern cryobiotechnologies;

• development of resource-saving technologies of breeding and rearing cultured species with improved production and consumer characteristics for freshwater and marine aquaculture;

• development of the biotechnological bases for breeding and rearing sturgeons and other cultured species and introduction of new, promising species into the aquaculture production;

• developing methods for the improvement of the functioning conditions of the aquatic ecosystems of natural and technological water bodies (and their parts) used for fisheries with the objective of increasing their biological productivity, obtaining environmentally safe products and preserving genetic resources in the natural environment.

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***	
Institute of Fisheries of the NAAS of Ukraine	☒ 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	• establishment of live gene banks of common carp breeds and valuable, rare and endangered fish species; • development of cryobiotechnologies and establishment of frozen gene banks of common carp breeds and valuable, rare and endangered fish species; • studying the genetic characteristics and establishment of genetic DNA banks of common carp breeds and valuable, rare and endangered fish species; • development and improvement of the technologies of domestication and rearing of valuable species in aquaculture; • development of programmes for reproduction, restocking and restoration of natural fish populations; • monitoring of valuable, rare and endangered fish species in their natural habitats; • improvement of the legislation and regulations directed towards the sustainable development and preservation of valuable genetic resources.	X

Main institutions, organizations, corporations and other entities	Area of research ***Mark all that apply***	Comments ***Please provide any additional information***	
the Azov Sea Research Institute (Berdyansk)	☒ 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	• establishment of live gene banks of Sturgeons; • studying the genetic characteristics and establishment of genetic DNA banks of common carp breeds and valuable, rare and endangered fish species; • development and improvement of the technologies of domestication and rearing of valuable species in aquaculture; • development of programmes for reproduction, restocking and restoration of natural fish populations; • monitoring of valuable, rare and endangered fish species in their natural habitats; • improvement of the legislation and regulations directed towards the sustainable development and preservation of valuable genetic resources.	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	3
Improve capacities for characterization and monitoring of aquatic genetic resources	1
Improve capacities for genetic improvement	5
Improve capacities for genetic resource management	1
Improve capacities for economic valuation of aquatic genetic resources	5
Improve capacities for conservation of aquatic genetic resources	1
Improve communication on aquatic genetic resources	3
Improve access to and distribution of aquatic genetic resources	3
Add other rows as appropriate and rank Add Row Remove Row	

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

• establishment of live gene banks of common carp breeds and valuable, rare and endangered fish species;
• development of cryobiotechnologies and establishment of frozen gene banks of common carp breeds and valuable, rare and endangered fish species;
• studying the genetic characteristics and establishment of genetic DNA banks of common carp breeds and valuable, rare and endangered fish species;
• development and improvement of the technologies of domestication and rearing of valuable species in aquaculture;
• development of programmes for reproduction, restocking and restoration of natural fish populations;
• monitoring of valuable, rare and endangered fish species in their natural habitats;
• improvement of the legislation and regulations directed towards the sustainable development and preservation of valuable 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	
5 Agricultural University have specialization in Aquaculture	Genetic resource management	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension	students	
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension	students	
	Genetic improvement	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension	students	X
	Economic valuation of aquatic genetic resources	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension	students	
	Conservation of aquatic genetic resources	☒ Undergraduate ☐ Post-graduate ☐ Training ☐ Extension	students	

Institute of Fisheries of the NAAS of Ukraine	Genetic resource management	☐ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension	PhD students	
	Characterization and monitoring of aquatic genetic resources	☐ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension	PhD students	
	Genetic improvement	☐ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension	PhD students	X
	Economic valuation of aquatic genetic resources	☐ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension	PhD students	
	Conservation of aquatic genetic resources	☐ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension	PhD students	

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	
ichthyological commission	One of the ways of solving inter-agency disputes and uncoordinated actions resulting in the mortality or irrational use of the aquatic genetic resources would be the establishment of an inter-agency ichthyological commission. This ichthyological commission should include the representatives of all stakeholders, as well as leading scientists who could solve, at a roundtable, any problems related to the sustainable and rational use of living aquatic resources. but not exist now	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	1
Increase information sharing between institutions	2
Add other rows as appropriate and rank Add Row Remove Row	

Please specify in box below

Intersectional coordination is important part of supporting of the conservation, sustainable use and development of aquatic genetic resources. But its level is low; for example, to get permission for catching fish from Red Book for domestication and forming of broodstock is a practically impossible even for research institutions.
The process of establishing cooperation among water users and users of aquatic genetic resources and performing a thorough analysis and impact assessment of their activities on the fisheries sector of Ukraine is often complicated and not constructive. For example, in the fisheries season of 2010, there was a massive fish kill in the Kiev Reservoir of River Dnieper because of a sudden and unexpected release of water from the dam of the Kiev Hydropower Plant. Such cases occur everywhere.

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	
Fish inspection organs belonging to the State Fisheries Agency of Ukraine Ecological inspection belonging to the Ministry of Nature of Ukraine	☐ 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	In general, activities related to aquatic genetic resources are, to different extent, performed by different organizations, institutions and enterprises belonging to different ministries and agencies. There is a network of fish inspection organs belonging to the State Fisheries Agency of Ukraine, a network of ecological inspection belonging to the Ministry of Nature of Ukraine, many fishing enterprises and water user enterprises and a number of civil and research organizations involved in the processes of water use, protection and rational use of living aquatic resources.The process of establishing cooperation among water users and users of aquatic genetic resources and performing a thorough analysis and impact assessment of their activities on the fisheries sector of Ukraine is often complicated and not constructive. For example, in the fisheries season of 2010, there was a massive fish kill in the Kiev Reservoir of River Dnieper because of a sudden and unexpected release of water from the dam of the Kiev Hydropower Plant. Such cases occur everywhere.	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***	
State Fisheries Agency of Ukraine	☐ 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

There is no specialized information system directed towards the rational management and sustainable use of aquatic genetic resources in Ukraine.
The work on determining total allowable catch limits for fish and other aquatic organisms in their natural environment (inland waters, Azov and Black seas) are done by research organizations, but this information has a local character, focuses on the most frequent commercial species and is hardly accessible to the general public.
Need:
- to improve communications between all Research and Governmental organizations
- to to establish interdepartmental ichthyologic commission

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

to improve quality of web information

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	
• Convention on Biological Diversity	Rio de Janeiro, Brazil, 5 June 1992	○ 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 International Trade in Endangered Species of Wild Fauna and Flora, CITES	Law of Ukraine No. 662-XIV of 14.05.1999	○ Strongly positive ◉ Positive ○ Negative ○ Strongly negative ○ No effect	◉ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect	One of the most important conventions that Ukraine joined in the recent years is the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). As all species of sturgeons and the Mississippi paddlefish (a representative of the order Acipenseriformes indigenous to North America and reared in aquaculture in Ukraine and other countries) are under CITES protection, all external trade operations with them, including transit movements and re-export, as well as their entry to the customs area of Ukraine, should be done only if they have the accompanying forms of permissive character (permits/ certificates) issued by the respective administrative bodies of CITES. According to the decision No. 1822 of 13.12.2000 of the Cabinet of Ministers of Ukraine, the State Fisheries Agency of Ukraine acts as the Administrative Body of CITES for sturgeons and any products made thereof. The scientific body of CITES Ukraine for sturgeons and products made thereof is the Southern Research Institute of Fisheries and Oceanography (Kerch). Thus, biological samples are taken from any batch of sturgeons or products made thereof and a	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	
				separate CITES permit/ certificate is issued for it, which significantly contributes to the legalization of the market of these high-value genetic resources and their conservation in the natural environment.	
• Convention concerning Fishing in the Black Sea between the Governments of the Union of Soviet Socialist Republics, the People's Republic of Bulgaria and the People's Republic of Romania	Varna, 7 July 1959) – Ukraine (legal successor	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect	fisheries in transboundary or shared water bodies	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	3	○ To a great extent ◉ To some extent ○ None ○ Unknown	
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	1	○ To a great extent ◉ To some extent ○ None ○ Unknown	
Improve capacities for genetic improvement	5	○ To a great extent ◉ To some extent ○ None ○ Unknown	
Improve capacities for economic valuation of aquatic genetic resources	3	○ To a great extent ◉ To some extent ○ None ○ Unknown	
Improve capacities for conservation of aquatic genetic resources	1	◉ To a great extent ○ To some extent ○ None ○ Unknown	
Improve communication on aquatic genetic resources	1	○ 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	3	◯ 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?

CITES convention directly regulates the regulatory and legal aspects of international trade in sturgeon species and Mississippi paddlefish, as well as the products made thereof.

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

- strengthening the fight against IUU fishing both in inland waters and in the exclusive economic zone of Ukraine in the Azov and Black seas;
- regulating the issues related to the import and export of living aquatic resources.

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.

- Ukraine has important role in sustainable Fishing in the Black Sea basing
- Ukraine realizes restocking program for native transboundary Sturgeons and Salmonids species

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