**Appendix 10**

**JOINT RUSSIAN – NORWEGIAN SCIENTIFIC RESEARCH PROGRAM ON LIVING MARINE RESOURCES IN 2024**

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### 1. Planning and coordination of investigations and submitting of results.

This appendix contains the program for investigations to be carried out in 2024 by Russia and Norway within the frames of the bilateral cooperation between the Norwegian and Russian Parties. The program is in accordance with the national research programs.

Planning, co-ordination and exchange of specialists will be settled between the institutes involved.

Russian and Norwegian research institutes will exchange results and data from joint investigations.

Norwegian and Russian scientists and specialists will meet online during 12-14 March 2024 to discuss joint research programs, results from surveys and investigations in 2023/2024 and to coordinate survey plans for the rest of 2024. If the situation does not permit a physical meeting, it will be held online on the same meeting dates. The cruise plans listed below are preliminary and may change. Missing names of vessels and periods for surveys in this report will be agreed by correspondence, latest by the annual Russian-Norwegian scientists’ meeting. Survey plans and methodology for preparing biological and acoustic data will be discussed and coordinated. Urgent data from surveys carried out before the scientists’ meeting will be exchanged by correspondence after agreement with the relevant institutions.

In the future work it is very important to take into account the knowledge about recent developments in the ecosystem such as environmental factors, introduction of new species, distribution and stock sizes of commercial species.

A preliminary program for the planned surveys and cooperation for 2024 is presented below. The outlined plans should be considered as a draft and will be shared when final plans are available.

In order to increase robustness of joint surveys the parties considered increasing the flexibility of mutual access to each other’s zones. Different mechanisms are possible and need to be considered further. Appropriate applications for research vessels entering to the EEZ’s must be ready in sufficient time before Winter and Barents Sea ecosystem surveys.

As long as the suspension of Russian scientists from ICES continues, assessments of shared stocks will be carried out by the Joint Russian-Norwegian Working Group on Arctic Fisheries (JRN-AFWG).

### 2. Investigations on fish and shrimp stocks, including stock size, structure and distribution.

IMR and VNIRO will continue the co-operation on the monitoring of the most important commercial species. The parties will exchange primary information during joint investigations according to the agreed formats.

***Norwegian surveys***

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | Norway N-2-01 | Survey title:  | Cod spawning stock  |
| Organization:  | IMR  |
| Time period:  | March – April | Vessel:  | R.V. “Johan Hjort”  |
| Target species:  | Cod  | Secondary species:  | Haddock, saithe  |
| Area:  | Spawning areas in Troms – Lofoten. |
| Purpose:  | Acoustic survey of the North East Arctic Cod spawning stock. Investigations on maturity, fecundity and egg abundance.  |
| Reported to:  | IMR survey report, ICES AFWG, JRN-AFWG |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation:Reference No.: | NorwayN-2-02 | Survey title:  | Fjord and coastal ecosystem survey  |
| Organization:  | IMR  |
| Time period:  | October-November | Vessel:  | R.V. “Johan Hjort” R.V. “Prinsesse Ingrid Alexandra” |
| Target species:  | Saithe, coastal cod, 0-group herring | Secondary species:  | Haddock, *Sebastes norvegicus* |
| Area:  | Norwegian fjords and coastal areas. |
| Purpose:  | Acoustic and trawl abundance estimation of saithe, coastal cod and other groundfish species. Acoustic abundance estimation of 0-group herring. Environmental investigations.  |
| Reported to:  | IMR survey report, ICES WGWIDE, ICES AFWG  |
|  |  |  |  |
| Nation: Reference No.: | NorwayN-2-03 | Survey title: | International ecosystem survey in the Nordic Seas  |
| Organization: | IMR  |
| Time period: | May – June | Vessel: | R.V. “G.O.Sars”,3 international R.V. |
| Target species: | Herring, blue whiting | Secondary species: | Other pelagic species |
| Area: | The Norwegian Sea, fishing zone of the Faeroe Islands, international waters, Exclusive Economic Zone of Norway, UK fishery zone, The Barents Sea and adjacent waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation. |
| Purpose: | Estimation of yearclass strength, abundance and biomass of herring and blue whiting, studies of their distribution and behaviour, marine mammal distribution and quantity. Acoustic survey of the stocks, oceanography, plankton. |
| Reported to: | ICES WGWIDE |

***Norwegian and Russian surveys***

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | Russia/NorwayJ-2-01 | Survey title:  | Winter Ecosystem trawl-acoustic survey for demersal fish stocks (Winter Survey)\* (survey name may be corrected) |
| Organization:  | IMR, VNIRO |
| Time period:  | January-March | Vessel:  | R.V. “Kronprins Haakon”R.V. “Johan Hjort” R.V. “Vilnyus” оr оther R.V. |
| Target species:  | Cod, haddock, saithe, catfishes, redfishes, Greenland halibut, plaice, herring, capelin, polar cod, shrimp, snow crab  | Secondary species:  | Other pelagic and demersal species, benthic organisms, marine mammals and sea birds, oceanographic and hydrobiological parameters |
| Area:  | The Barents Sea and adjacent waters, international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation, Exclusive Economic Zone of Norway, Spitsbergen area. |
| Purpose:  | Estimation of yearclass strength, abundance and biomass of cod, haddock and other demersal species. Collection of biological samples, oceanographic measurements.  |
| Reported to:  | Joint IMR/ VNIRO Report Series, JRN-AFWG |

\*Russian part as a part of comprehensive marine investigations in the Northern Seas of the Russian Federation after agreement with relevant institutions.

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | Russia/NorwayJ-2-02 | Survey title:  | Ecosystem survey in the Barents Sea and Adjacent waters of the Arctic ocean (BESS) \* (survey name may be corrected) |
| Organization:  | IMR, VNIRO |
| Time period:  | August-October | Vessel:  | R. V. “Vilnyus” or other R.V.R.V. “G.O. Sars”R.V. “Johan Hjort” R.V. “Kronprins Haakon” |
| Target species:  | Cod, haddock, saithe, catfishes, redfishes, Greenland halibut, plaice, herring, capelin, polar cod, shrimp, snow crab | Secondary species:  | Other pelagic and demersal species, benthic organisms, marine mammals and sea birds, oceanographic and hydrobiological parameters |
| Area:  | The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, international waters, Exclusive Economic Zone of the Russian Federation, and territorial waters of the Russian Federation. The Kara Sea, Arctic Ocean. |
| Purpose:  | Investigations of distribution and abundance of 0-group of different species, estimation of abundance and biomass of pelagic species, demersal species, shrimp, snow crab, Greenland halibut juveniles, marine mammal and sea birds distribution and quantity. Oceanography, plankton, species interactions, sampling for determining pollution levels.  |
| Reported to:  | Joint IMR/VNIRO Report Series, NAFO WGHARP, NAMMCO, JRN-AFWG |

\*Russian part as a part of comprehensive marine investigations in the Northern Seas of the Russian Federation after agreement with relevant institutions.

### 3. Research program on deep sea fishes

To assess the stock of *Sebastes mentella* in the open Norwegian Sea a redfish survey has been established. This survey was run as a coordinated effort by Norway, Russia and the Faroes in 2009. It was not conducted in 2010-2012, but was run by Norway in September 2013, August 2016, August 2019 and August 2022. Results are reported to JRN-AFWG.

A multi annual survey plan for monitoring of deep-sea species is in action for Norwegian surveys. In 2023 the northern deep-water slope was surveyed with Greenland halibut and beaked redfish as main target species. In 2024 the southern deep-water slope will be surveyed with Greater argentine, beaked redfish and Greenland halibut as main target species.

Indices for Greenland halibut are derived from the Ecosystem Survey, and precursor surveys. In this context, it is important that coverage of the nursery area in the northern Barents Sea and northern Kara Sea is sustained in the survey.

According to this, the following survey will be carried out in 2024:

|  |  |  |  |
| --- | --- | --- | --- |
| Nation:Reference No.: | NorwayN-3-01 | Survey title: | Southern Deepwater Slope Survey (Egga-Sør) |
| Organization: | IMR |
| Time period: | March-April | Vessel: | R.V. “G.O.Sars” |
| Target species: | Greater argentine, beaked redfish and Greenland halibut | Secondary species: | Other Deep water species and elasmobranches |
| Area: | Ecosystem along the Norway slope from 62 to 68 degrees north. |
| Purpose: | Primary objective: to assess the state of commercial deepwater fish stocks. Secondary objective: to monitor the state of deepwater ecosystems along the slope. Part of IMR's multiannual survey strategy for deepwater species. |
| Reported to: | IMR survey report, ICES AFWG, ICES WGEF, ICES WGDEEP, ICES WIDEEPS, JRN-AFWG |

### 4. Red king crab (*Paralithodes camtschaticus*) and snow crab (*Chionoecetes opilio)*

The Parties exchanged information about the ongoing national red king crab and snow crab research and fishery in 2023 and the research plans for 2024.

The Parties agreed that some of the questions of biology, stock assessment and fishery of crabs require further research. The parties confirmed their intention to continue the study of the following issues:

- Ecological role of the red king crab and the snow crab in the Barents Sea;

- Main life history parameters of these two new crab species in the Barents Sea;

- New methods for crab stock assessments and monitoring (sampling gears, survey area etc.).

Scientists from Russia and Norway will conduct a number of national surveys on the red king crab and snow crab in the Barents Sea. The objectives of these surveys are: to assess distribution, abundance, size/sex composition and biological characteristics of the crabs, in addition to tagging experiments.

Information will be exchanged between scientists and the results will be presented in survey reports and publications.

### 5. Fishing technology and selectivity of fishing gears

Research activity in these fields continues to be carried out with the aim to develop:

- fishing gears that are more species and size selective and have less negative impact on fish that escape the gear, and have less negative ecosystem effects in general;

- improved survey gears and methodology.

### 6. Marine mammals

The Russian and Norwegian research program on marine mammals should be aimed at assessments of distribution and abundance of the most important species, and their trophic linkages with other marine resources, with particular emphasis on fish species. The low population size of hooded seals in the Greenland Sea and apparent decrease in harp seal pup production in the White Sea in recent years is a matter of concern, which requires increased research and monitoring effort.

Norwegian activities in 2024 include efforts to keep the populations of harp and hooded seals data rich (i.e., data used in assessment models should be less than 5 years old), and to improve the models used in the assessments of these stocks. Analyses of biological material from hooded seals, collected during research surveys in the Greenland Sea (the West Ice), and from harp seals, collected during commercial seal hunt in the West Ice and in the south-eastern parts of the Barents Sea (the East Ice), continues. Furthermore, boat-based surveys to estimate abundance of harbour and grey seals will be carried out in Norwegian coastal areas. These surveys are included in a five-year cycle (2022-2026) which will result in a new, updated population estimates for the entire Norwegian coast in 2026. Comprehensive line-transect sighting surveys for minke whales (and other whales) will be conducted in the Spitsbergen area (ES) in 2024. These surveys are included in a six-year cycle (2020-2025) of sighting surveys which will result in new, updated whale estimates for the Northeast Atlantic area in 2026. Also, experiments with tagging of minke whales with a new type of electronic tags will be carried out in Norway. Experiments will be carried out to test effects of acoustic alarms to reduce interactions of humpback and killer whales with coastal fisheries.

Russian activities in 2024 will include the traditional study of correlation between ice conditions in the White Sea and adjacent areas of the Barents Sea and harp seals of the White Sea/Barents Sea population. Also, in 2024, Russia plans (if funding is secured) to conduct traditional multispectral aerial surveys of harp seal pups of the White Sea/Barents Sea population on their traditional whelping patches in the White Sea as well as in non-traditional areas in the northern and south-eastern parts of the Barents Sea using aircraft and drones. In traditional areas (the White Sea) surveys will be made with both vehicle types, in non-traditional areas - in the northern and south-eastern parts of the Barents Sea only a specially equipped Russian aircraft will be used. Both vehicles will be equipped with the same types of photo- and infrared cameras. Besides, and if possible (i.e., funding secured), complex dedicated aerial surveys (using aircraft and/or drones) are planned to study other marine mammal species distribution and numbers, and also information about environmental conditions and the distribution of fish species and other marine organisms. Areas for these aerial surveys will be the Barents and Kara Seas. During Russian and international ecosystem survey in the Barents Sea and Kara Seas opportunistic marine mammal sightings will be carried out. Additionally, scientific observers will continue to collect data on marine mammal distribution on board commercial vessels in the North Atlantic, including the Barents Sea. Traditional annual coastal and motor-boat surveys with the purpose to observe marine mammal species and to collect biological material will be carried out. Sampling of biological material will occur during the Russian commercial harp seal hunt (if it will be carried out). Also, there are plans to continue work on the improvement of the White Sea/Barents Sea harp seal population model used to assess abundance.

As part of the Norwegian and Russian Research Program on Harp Seal Ecology, telemetric investigations of harp seals will be attempted carried out in the White Sea in a joint Norwegian-Russian project if ice conditions are suitable in April-May 2024. Joint observations of marine mammals on the ecosystem surveys will continue. The survey will be carried out if suitable funding is obtained.

***Norwegian surveys***

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | NorwayN-6-01 | Survey title:  | Monitoring of biological parameters, harp seals  |
| Organization:  | IMR  |
| Time period:  | March-May  | Vessel:  | 1 sealer  |
| Target species:  | Harp seal  | Secondary species:  |  |
| Area:  | Southeastern Barents Sea  |
| Purpose:  | Collection of biological material from harp seals during commercial sealing. |
| Reported to:  | ICES, NAMMCO, JNRFC  |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | NorwayN-6-02 | Survey title:  | Line transect surveys of minke whales |
| Organization:  | IMR  |
| Time period:  | July - August  | Vessel:  | Rented vessels  |
| Target species:  | Minke whales  | Secondary species:  | Other large whales  |
| Area:  | Spitsbergen area |
| Purpose:  | Sighting surveys to assess abundance of minke whales, and abundance, distribution and species composition of other marine mammals. |
| Reported to:  | IWC, NAMMCO |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | NorwayN-6-03 | Survey title:  | Telemetric tagging of minke whales |
| Organization:  | IMR  |
| Time period:  | May and August-September | Vessel:  | Prinsesse Ingrid Alexandra (May) and rented vessels (Aug-Sep) |
| Target species:  | Minke whales  | Secondary species:  | Humpback whales, fin whales |
| Area:  | Coast of North Norway, Svalbard |
| Purpose:  | Telemetric tagging of minke whales.  |
| Reported to:  | IWC, NAMMCO |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | NorwayN-6-04 | Survey title:  | Boat- and drone-based studies of harbour seal abundance |
| Organization:  | IMR  |
| Time period:  | August-September | Vessel:  | Rented vessel |
| Target species:  | Harbour seals  | Secondary species:  |  |
| Area:  | Mid Norwegian coast |
| Purpose:  | Estimation of the total number of harbour seals by visual observations and use of drones. |
| Reported to:  | NAMMCO, ICES  |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | NorwayN-6-05 | Survey title:  | Boat based survey of grey seal abundance |
| Organization:  | IMR  |
| Time period:  | October-November | Vessel:  | Rented vessel |
| Target species:  | Grey seals  | Secondary species:  |  |
| Area:  | Northern Nordland including Lofoten |
| Purpose:  | Estimation of grey seal pup production. |
| Reported to:  | NAMMCO, ICES  |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | NorwayN-6-06 |  Survey title:  | Testing methods to avoid whales in purse seine fisheries |
| Organization:  | IMR  |
| Time period:  | November | Vessel:  | Rented vessel |
| Target species:  | Humpback whales  | Secondary species:  | Killer whales |
| Area:  | North Norwegian coast (Troms-Finnmark)  |
| Purpose:  | Test effect of acoustic alarms to reduce interactions between whales and purse seine fisheries for herring.  |
| Reported to:  | IWC, NAMMCO  |

***Russian surveys***

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.: | RussiaR-6-01 | Survey title: | Multispectral aerial survey of harp seal whelping patches (if funding is secured) |
| Organization: | VNIRO |
| Time period: | March | Vessel: | Drone and special equipped aircraft (SEA)  |
| Target species: | Harp seal | Secondary species: | White whale, walrus and other species of marine mammals |
| Area: | The White Sea and the Barents Sea adjacent area, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation |
| Purpose: | Study of distribution and abundance (by estimation of number of pups in the whelping patches) of the White Sea harp seal population, study of harp seal ecology and their influence on fish species as top predators.  |
| Reported to: | Internal VNIRO (Polar Branch) survey report, JRNFC, NAMMCO |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.: | RussiaR-6-02 | Survey title: | Comprehensive aerial research surveys of marine mammals (if funding is secured)  |
| Organization: | VNIRO (Polar and Northern Branches)  |
| Time period: | July-September | Vessel: | SEA) and/or drone |
| Target species: | Minke whale, fin whale, humpback whale, white whale, white-beaked dolphin, harp, ringed, grey, common, and bearded seals, walrus | Secondary species: | Hooded seal, and other species of marine mammal, seabirds, fish schools, oceanographic and hydrobiological parameters  |
| Area: | The White, Barents and Kara Seas. |
| Purpose: | Study of marine mammal distribution and abundance in relation to environmental conditions, fish species and other marine organisms’ distribution for better understanding of the effect of marine mammals on the main commercial fishes and for use in ecosystem models for management of commercial living marine resources.  |
| Reported to: | Internal VNIRO (Polar and Northern Branches) survey report, JRNFC, NAMMCO |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.: | RussiaR-6-03 | Survey title: | Marine mammal coastal research and observations including collection of biological samples |
| Organization: | VNIRO (Polar Branch)  |
| Time period: | March-September | Vessel: | Coastal expedition with the use of available transport and different types of motor-boats |
| Target species: | Harp seal, minke whale, fin whale, humpback whale white whale, ringed, grey, common, and bearded seals | Secondary species: | Other species of marine mammals and fishes  |
| Area: | Coast of the Barents, White and Kara Seas. |
| Purpose: | Collection of biological data, study of distribution and migration routes, estimation of numbers, marine mammals monitoring, assessment of marine mammal influence on fish species, assessment of climatic changes and human activities on marine mammals, data for ecosystem modelling.  |
| Reported to: | Internal VNIRO (Polar Branch) survey report, JRNFC, NAMMCO |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.: | RussiaR-6-04 | Survey title: | Opportunistic marine mammal sightings during International ecosystem survey of the Northern Seas  |
| Organization: | VNIRO (Polar Branch) |
| Time period: | May-June | Vessel: | PINRO research vessel (if funding is secured) |
| Target species: | Minke whale, fin whale, humpback whale, white whale, white-beaked dolphin  | Secondary species: | Hooded seal, harp, ringed, grey, common, and bearded seals, walrus, and other species of marine mammal, seabirds, fish schools, oceanographic and hydrobiological parameters  |
| Area: | The Barents Sea and south-eastern part of the Norwegian Sea |
| Purpose: | Study of marine mammal distribution and abundance in relation to environmental conditions, fish species and other marine organisms’ distribution for better understanding of the effect of marine mammals on the main commercial fishes and for use in ecosystem models for management of commercial living marine resources  |
| Reported to: | Internal VNIRO (Polar Branch) survey report, JRNFC, NAMMCO |

|  |  |  |  |
| --- | --- | --- | --- |
| Nation: Reference No.:  | RussiaJ-6-01  | Survey title:  | Harp seal tagging in the White Sea within the framework of marine mammal coastal research |
| Organization:  | VNIRO (Polar Branch),  |
| Time period:  | April-May  | Vessel:  | Aircraft for reconnaissance, helicopter, vessel, boats  |
| Target species:  | Harp seal  | Secondary species: No  |   |
| Area:  | The White Sea area |
| Purpose:  | Study of the harp seal biology and ecology using satellite telemetry. Part of the Norwegian Russian Research Program on Harp Seal Ecology initiated by JNRFC.Marine mammal monitoring, assessment of marine mammal influence on fish species, assessment of climatic changes and human activities on marine mammals  |
| Reported to:  | VNIRO (Polar Branch), JNRFC, NAMMCO  |

### 7. Investigations on age determination of fish

VNIRO and IMR’s views on age reading methods for redfish and Greenland halibut needs further exploration towards a common best practice. Meetings of experts and exchange of otoliths should also be resumed.

Next meetings on age reading for cod, haddock and Greenland halibut are scheduled for 2024 and will be organized by IMR.

A system for transferring otoliths between IMR and VNIRO needs to be set up to resume regular calibration of age readings. Images of otoliths will temporarily be used instead of a physical exchange of otoliths until a system for exchange is in place. Norwegian otoliths collected in 2021-2023 will be photographed and images will be shared with VNÌRO according to the agreed plans of the long-term cooperation. In the absence of the possibility of physical meetings between readers the quality assurance workshop will be held online.

Further activities will be discussed during the annual meeting of Russian and Norwegian scientists in March 2024.

### 8. Investigations on survey methodology, index calculations and assessment methods

***Handling and exchange of data for assessments***

Russian and Norwegian colleagues continue to develop new databases and software to make stock size estimates in a consistent, common, and quality assured way.

***Surveys in the Barents Sea***

Russian and Norwegian institutions see the need to continue the optimization of survey strategies, given the limited access to resources, both in terms of experts, ships and financial supporting for such activities. This issue remains one of the most difficult and requires very careful consideration. Many different aspects such as assessment needs, finance, prioritization of work, time period, etc. need be taken into account. Scientists will discuss survey strategies and implementation of an appropriate multi-year survey plan during the annual scientist meeting.

***Survey on spawning capelin***

IMR has carried out a survey to estimate the abundance of spawning capelin in February-March during 2019 to 2023 using commercial fishing vessels. The benchmark concluded that the survey could be used as an alternative abundance index for the spawning stock in case of poor survey coverage for the BESS. The capelin spawning survey is not planned for in 2024.

### 9. Benchmarks and evaluation of harvest control rules

Shrimp, Greenland halibut, capelin, harp seal and hooded seals have all been benchmarked by ICES in 2022/2023. The results of the benchmarks have been reviewed by JRN-AFWG and implemented in recent assessments.

|  |  |  |  |
| --- | --- | --- | --- |
| **Species/stock** | **Date** | **Meeting** | **Delivery** |
| Shrimp | 5-6 Dec. 2023 | JRN-AFWG | 1. Scoping process with stakeholders. 2. Finalize the simulation. framework to test HCRs relative to management objectives.3. Make list of candidate HCRs to be tested. |
| 14-15 Feb. 2024 | JRN-AFWG together with external reviewers | 1. Review results of HCR tests.2. Consider an exceptional circumstances protocol.3. Finalize report on the MSE process and results. |
| 12-14 Mar. 2024 | March meeting | Report on progress. |
| 8-9 May 2024 | JRN-AFWG | Finalize recommendation to JNRFC on suitable HCRs and management strategy.  |
| 21-25 Oct. 2024 | JNRFC | Potentially adopt and apply new HCR for deriving the TAC for 2025.  |
| Capelin |  16-17 Jan. 2024 | JRN-AFWG | 1. Scoping process with stakeholders. 2. Decide on how to construct simulation framework to test HCRs relative to management objectives, including values to use for the various sources of uncertainty.3. Make list of candidate HCRs to be tested. |
| 12-14 Mar. 2024 | March meeting | Present method, scenarios and preliminary results at the March meeting. |
| 14-15 May 2024 | JRN-AFWG together with external reviewers | 1. Review results of HCR tests.2. Consider an exceptional circumstances protocol.3. Finalize report on the MSE process and results. |
| 17-18 June 2024 | JRN-AFWG | Finalize recommendation to JNRFC on suitable HCRs and management strategy.  |
| 21-25 Oct. 2024 | JNRFC | Potentially adopt and apply new HCR for deriving the TAC for 2025.  |
| Greenland halibut | Timeline to be outlined in 2024 | JRN-AFWG | To be decided |
| Beaked redfish | Timeline to be outlined in 2024 | JRN-AFWG | To be decided |

Development and evaluations of harvest control rules (HCR) of shared stocks will be addressed in bilateral Russian-Norwegian meetings as outlined in Table 1.

 **Table 1**. Workplan for the development of new management procedures. Dates could be slightly changed if necessary.

The results of the work should be presented to the 54th session of JNRFC. The aim is to provide the necessary background for JNRFC to agree on possible revisions of the HCR for capelin and a new HCR for shrimp as a first priority.

The shrimp stock assessment and advice on TAC for 2024 will be carried out primo December 2023 in accordance with the procedure established for advisory processes for JRN-AFWG in the protocol for the March meeting in 2022.

The work plan (Table 1) will be reviewed and updated at the 54th session of the JNRFC.

### 10. Research and long-term monitoring on benthic organisms

Long term monitoring on benthic organisms on both Russian and Norwegian side of the Barents Sea should be continued. This includes exchange of personnel between VNIRO and IMR in order to standardise processing of trawl samples and species identification.

Russian and Norwegian scientists will continue investigations of vulnerable habitats and species in the Barents Sea and adjacent waters.

### 11. Determination of conversion factors

Accurate conversion factors are necessary in order to estimate the actual catches of the joint exploited stocks. Varying fishing and processing conditions, such as fishing areas and seasons, length-weight characteristics, fishing gear, technological parameters of raw fish processing including different ways of processing (machine or manual), processing equipment, ways of freezing, packing and storage require continuous investigations. It is necessary to obtain additional data on conversion factors for fish and selected crustaceans, taking into account inter-annual biological variations and effects of fishing gear and technological processing equipment.

Russia and Norway will continue efforts to set accurate conversion factors for products of deep sea shrimp.

Research will be carried out in accordance with paragraph 4.2 of the Protocol of the Permanent Russian-Norwegian committee on management and control issues in the fisheries sector in 2021.

To determine conversion factors, Russian and Norwegian scientists will collect data on-board commercial vessels. Survey reports will be available for appropriate authorities in Russia and Norway.

### 12. Development of genetic database for fish species

The further development of joint VNIRO/IMR genetic database for Atlantic salmon populations will continue in 2024 and include sampling for farmed salmon escapees in coastal areas and in rivers. The aim of sampling for farmed salmon escapees in rivers is to provide data for quantifying genetic introgression of farmed fish into wild Atlantic salmon populations.

Russian and Norwegian scientists will continue to explore genetic polymorphism and to investigate population structure of several fish species in the Barents Sea. The studies are focused on but not confined by the cod, capelin, polar cod and the redfish, with the DNA markers for these species to be identified within the next years. The basis for sampling is the surveys conducted by both sides. For polar cod, more samples from the southeastern Barents Sea are needed.

Various types of genetic markers for the identification of species within the genus *Sebastes* have been tested at IMR and VNIRO. IMR have collected fish samples that can be used for such analyses. Workshops on this topic should be planned for in the future.

### 13. Monitoring of pollution levels in the Barents Sea

VNIRO and IMR will continue to monitor pollution levels in accordance with national programs. Monitoring pollutants is an important task to understand potential impacts on the Barents Sea food web and related food safety. Samples of seawater, sediments and fish will be collected and analysed for organic pollutants, heavy metals and micro-plastic. Parties will continue monitoring of marine litter.

### 14. Monitoring of the hydrochemical conditions in the Barents Sea

Monitoring of the hydrochemical conditions in the Barents Sea will contribute to improving knowledge about the state and variability of the marine ecosystem. It was agreed to continue exchanging results of chemistry analysis of water samples utilizing national institutes.

### 15. Russian-Norwegian Fisheries Science Symposia

The 19th Joint Symposium, entitled “Multispecies management: species interactions and trade-offs, environmental changes and multiple pressures”, was originally planned to take place in Tromsø in June 2022, but was rescheduled to June 2023. Earlier this year, however, it was decided to postpone the symposium until June 2024. The original plan was to arrange the symposium in person at the Fram Centre in Tromsø, Norway, but the alternative option of an electronic platform now seems more likely. The symposium will be held during 11-13 June 2024. The provisional programme includes 4 theme sessions with 8 main reports, 38 presentations and 5 posters. The number of presentations may be changed.

The programme includes the following theme sessions coordinated by the nominees from the Russian and Norwegian parties:

Session 1: Predation and competition. (Tore Haug / Andrey Dolgov)

Session 2: Mixed fisheries and bycatch. (Bjarte Bogstad / Konstantin Sokolov)

Session 3: Pressures on environment and ecosystems. (Mette Skern Mauritzen / Andrey Krovnin)

Session 4: Multispecies and ecosystem modelling. (Elena Eriksen / Yury Kovalev)

Further arrangement details will be discussed at the annual scientist meeting in 2024. The contributions to the Symposium will be presented in a volume of the Joint IMR-VNIRO Report Series. In addition, selected contributions will be invited to submit manuscripts to be published in a special issue of a scientific journal.

### 16. Advisory process for shared stocks

Due to the temporary suspension of Russian scientists from ICES, the Joint Russian-Norwegian Working Group on Arctic Fisheries (JRN-AFWG) has been established to assess shared stocks in the Barents Sea (cod, haddock, capelin, Greenland halibut, redfish (*S. mentella*) and deep-sea shrimp). The finalization and approval of advice is made by an advisory committee, chaired by research directors of IMR and VNIRO.

The annual JRN-AFWG working schedule is as follows: Cod, haddock, Greenland halibut and *S. mentella* will be assessed at a meeting in May-June. Capelin and shrimp will be assessed in October immediately after the ecosystem survey. For Greenland halibut and *S. mentella* advice will be for two years, while for the other stocks advice is given annually.

At each of these two meetings, a working group report is made together with a draft advice. The draft advice will be reviewed and finalized by the advisory committee. The committee will meet two weeks after the end of the May-June JRN-AFWG meeting, and as soon as possible after the October meeting.

Templates for assessment reports and advice have been agreed upon. The assessment report and advice are subsequently published in the joint report series between IMR and VNIRO.

A detailed schedule for the advisory annual process will be agreed upon at the scientists meeting in March.

### 17. Data exchange

It was agreed to exchange data collected in scientific surveys and by observers on board of commercial vessels:

* all data collected in joint surveys relevant to stock assessments and environment conditions;
* field data on temperature and salinity in the Barents Sea with 1 m depth interval from oceanographic stations;
* results of hydrochemical analysis obtained during joint surveys in the Barents Sea;
* data on marine litter and pollution;
* mean length and weight at age as well as maturity at age used in commercial stock assessments;
* surveys abundance indexes and acoustic data used in commercial stock assessments;
* stomach content of commercially important species;
* otoliths and scales collected under the program for age validation of bottom and pelagic fish;
* data on plankton and benthic fauna;
* scales and tissue samples collected for further development of joint genetic database for Atlantic salmon;
* data on the biology of seals of the White Sea population (mortality, maturation, size-at-age, feeding data, ice conditions in the White Sea and adjacent waters of the southeastern Barents Sea);
* data on marine mammals and sea birds distribution and numbers from annual joint ecosystem surveys;
* fisheries statistics for key commercial fish species in ICES Sub-areas 1, 2a, 2b needed for stock assessments of commercial fishes (catches, age composition of catches, mean weights at age in catch).

The above list will be updated during the scientist meeting in 2024. All data should be exchanged as soon as possible after the agreement of the relevant institutions.

### 18. Research catch allocated for investigations of marine resources and monitoring

The catch volumes shall enable to carry out all tasks described in “Joint Norwegian – Russian Scientific Research Program on Living Marine Resources in 2024” including surveillance activities to provide recommendations on area closures/reopening as well as other decisions on management of fishing activities on living marine resources in ICES Subarea 1 and 2 including respective EEZs of Russia and Norway, international waters (“Loophole”) and Svalbard (Spitsbergen) area.

To solve these tasks the following catch quantities are decided and shall be available in equal parts for both Parties in 2024:

* 14 000 tonnes of cod in addition to volumes mentioned in Appendix 3
* 8 000 tonnes of haddock in addition to volumes mentioned in Appendix 3
* 500 tonnes of capelin in addition to volumes mentioned in Appendix 3
* 1 500 tonnes of Greenland halibut in addition to volumes mentioned in Appendix 3

The Parties will make all efforts to fulfil the program.

All catches taken for research and management purposes should be recorded in the catch statistics separately.

Under “The Joint Russian – Norwegian Scientific Research Program on Living Marine Resources in 2024” the Norwegian party will grant permission to fish and catch their living marine resources to vessels owned or hired by VNIRO or other Russian scientific institutions in the Norwegian Economic Zone in amounts not exceeding:

* 5 000 tonnes of cod
* 3 000 tonnes of haddock
* 250 tonnes of capelin
* 700 tonnes of Greenland halibut

Under “The Joint Russian – Norwegian Scientific Research Program on Living Marine Resources in 2024” the Russian party will grant permission to fish and catch their living marine resources to vessels owned or hired by IMR and other Norwegian scientific institutions in the Exclusive Economic Zone of the Russian Federation and in amounts not exceeding:

* 5 000 tonnes of cod
* 3 000 tonnes of haddock
* 250 tonnes of capelin
* 700 tonnes of Greenland halibut