Appendix 10

JOINT RUSSIAN – NORWEGIAN SCIENTIFIC RESEARCH PROGRAM ON LIVING MARINE RESOURCES IN 2011

Contents

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

This program contains the investigations to be carried out in 2011 by Norway and Russia within the frames of the bilateral cooperation between the Norwegian and Russian Parties. The program is in accordance with the national research programs.

Planning coordination and exchange of specialists will be settled between the institutes involved.

PINRO and IMR will exchange results and data from joint investigations.

Scientists and specialists from PINRO, VNIRO and IMR will meet in Murmansk, Russia 14-18 March 2011 to discuss joint research programs, results from surveys and investigations in 2010/2011 and to coordinate survey plans for the rest of 2011. Missing names of vessels and time periods for surveys in this report will be agreed by correspondence, latest by the March meeting. Future plans for surveys and methodology for preparing biological and acoustic data will be discussed and coordinated. Urgent information according to surveys carried out before the meeting in March will be exchanged by correspondence.

By October 2010, 6 reports have been issued in the Joint IMR-PINRO report series during 2009-2010.

A preliminary program for the planned surveys and cooperation for 2011 is presented below.

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

IMR and PINRO will continue the co-operation on the monitoring of the most important commercial fish and shrimp stocks according to the Program listed below. The work will also include continued co-operative research on by-catch of juvenile fish in the shrimp fishery. The parties will exchange primary information during joint investigations according to agreed formats.

Norwegian investigations

Nation:	Norway	Survey title:	Cod spawning stock
Reference No.:	N-2-01		
Organization:	IMR		
Time period:	March-April	Vessel:	R.V. "Johan Hjort"
Target species:	Cod	Secondary species:	Haddock, saithe
Area:	Spawning areas 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 2011		

Nation:	Norway	Survey title:	Fjord and coastal ecosystem survey
Reference No.:	N-2-02		
Organization:	IMR		
Time period:	October October	Vessel:	R.V. "Johan Hjort" R.V. "Jan Mayen"
Target species:	Saithe, coastal cod, 0-group herring	Secondary species:	Haddock, *Sebastes marinus*
Area:	Northern Norwegian fjords and coastal areas from Varanger to Skagerrak		
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 2012, ICES AFWG 2012		

Russian investigations

Nation:	Russia	Survey title:	Marine resource investigations of Greenland halibut for the collection of fisheries and biological information on stock state and for the development of recommendations on technical regulations
Reference No.:	R-2-01		
Organization:	PINRO		
Time period:	January-December	Vessel:	5 rented trawlers
Target species:	Greenland halibut	Secondary species:	Cod, haddock, saithe, long rough dab, catfishes, redfishes (*S. mentella, S. marinus*)
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway		
Purpose:	Collection of data on CPUE, biological data on species, sex and age composition of Greenland halibut catches. Study of spatial and temporal distribution of concentrations; study of trophic relationships between Greenland halibut and other species; study of seasonal dynamics of catches, investigation of Greenland halibut migration patterns, timing and distance using tagging; investigation of Greenland halibut behaviour in the trawl mouth with the use of deepwater video-acoustic complex.		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Resource investigations and the estimation of resource supply for long-line fishery on Greenland halibut
Reference No.:	R-2-02		
Organization:	PINRO		
Time period:	January-December	Vessel:	2 rented long-liners
Target species:	Greenland halibut	Secondary species:	Cod, haddock, wolffish
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway		
Purpose:	Collection of data on CPUE, biological data on species, sex and age composition of Greenland halibut catches. Study of spatial and temporal distribution of concentrations; study of trophic relationships between Greenland halibut and other species; study of seasonal dynamics of catches, investigation of Greenland halibut migration patterns, timing and distance using tagging.		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Evaluation of resources for long-line fishery.
Reference No.:	R-2-03		
Organization:	PINRO		
Time period:	January-December	Vessel:	2 rented long-liners
Target species:	Cod, haddock, Greenland halibut	Secondary species:	Catfishes and other demersal fish
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey zone" , international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Elaboration of recommendations on effective use of resources for long-line fishery on fish species taken as bycatch in the fishery for Greenland halibut, cod, haddock and catfishes		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Marine resource investigations of demersal fish for the collection of information characterizing fishery and its effects on marine species in order to develop measures aimed at conservation and comprehensive utilization of marine biological resources.
Reference No.:	R-2-04		
Organization:	PINRO		
Time period:	January-December	Vessel:	13 rented trawlers
Target species:	Cod, haddock, saithe	Secondary species:	Catfishes, Greenland halibut, long rough dab, redfishes and other species
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey zone", international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Collection of biological materials for stock assessment by mathematical methods, collection of fisheries and biological data, estimation of discards and unreported catch, collection of CPUE data and materials on feeding, estimation of bycatches of undersized fish, development of recommendations on the protection of juveniles, collection of oceanographic data, studies of "environment-organism" relations, marine pollution control, studies of spatial and temporal distribution of fish aggregations, studies of time, duration and distances of migrations. Tagging, collection of oceanographic data, estimation of anthropogenic impact on marine species and their environment.,		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Marine resource investigations of demersal fish for the collection of biological information on the state of demersal fish stocks and on the impact of fishery on these stocks
Reference No.:	R-2-05		
Organization:	PINRO		
Time period:	February-June July-November	Vessel:	R.V. "Vilnjus" and 5 rented trawlers
Target species:	Cod, haddock, saithe	Secondary species:	Catfishes, Greenland halibut, long rough dab, plaice, redfishes
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey zone", international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Collection of CPUE data, biological state during wintering and spawning, species composition of catches, cod predation on their own juveniles and other fish species and invertebrates, discards of undersized cod and haddock. Study of intra-species structure using genetic methods, quantitative estimation of by-catch of undersized fish.		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Trawl-Acoustic survey for the immature stock of haddock and saithe in the southern part of the Barents Sea
Reference No.:	R-2-06		
Organization:	PINRO		
Time period:	May-June	Vessel:	R.V. "Fridtjof Nansen", R.V. "Vilnjus" R.V. "Professor Boiko"
Target species:	Haddock, saithe, cod	Secondary species:	Redfishes, long rough dab, plaice, Greenland halibut, northern wolffish, spotted catfish and others
Area:	The Barents Sea and adjacent waters, Exclusive Economic Zone of Norway, "Grey zone", Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation.		
Purpose:	Assessment of immature part of the haddock stock, quantitative estimation of saithe; oceanography.		
Reported to:	PINRO survey report, ICES AFWG in 2012		

Nation:	Russia	Survey title:	Assessment survey on juvenile saithe, cod, haddock and other demersal species in Murman fjords
Reference No.:	R-2-07		
Organization:	PINRO		
Time period:	August-September	Vessel:	R.V. "Professor Boiko"
Target species:	haddock, saithe, cod	Secondary species:	redfish (*Sebastes mentella*), long rough dab, plaice, northern wolffish, spotted catfish
Area:	The Barents Sea and adjacent waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Investigation of distribution of juvenile commercial fish in Murman fjords, collection of data on biology, distribution and density of concentrations.		
Reported to:	Internal PINRO survey report, ICES AFWG in 2011		

Nation:	Russia	Survey title:	Multispecies trawl-acoustic survey for estimation of juveniles and stock assessment of demersal fish in the Barents Sea and adjacent waters
Reference No.:	R-2-08		
Organization:	PINRO		
Time period:	October-December	Vessel:	R.V. "Fridtjof Nansen" R. V. "Vilnjus"
Target species:	Cod, haddock, saithe, redfish, Greenland halibut	Secondary species:	Northern wolffish, spotted catfish, (*S. mentella*), plaice, long rough dab and others
Area:	The Barents Sea and adjacent waters, , Spitsbergen area, Exclusive Economic Zone of Norway, "Grey zone", international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation.		
Purpose:	Evaluation of strength of yearclasses of cod and haddock at the stage of bottom juveniles, redfishes and other demersal fish; assessment of total and fishable stocks of Greenland halibut, cod, haddock, redfishes, catfishes, long rough dab and other fish species; estimation of zooplankton biomass; parasitologic and faunistic studies, study of "predator-prey" relations: oceanography.		
Reported to:	PINRO survey report, ICES AFWG in 2012		

Nation:	Russia	Survey title:	Trawl-Acoustic survey for spawning stock of capelin
Reference No.:	R-2-09		
Organization:	PINRO		
Time period:	January - April	Vessel:	R. V. "Fridtjof Nansen" R. V. "Vilnjus", or 2 rented trawlers
Target species:	Capelin	Secondary species:	Herring, polar cod
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey" zone, international waters,. Russian Exclusive Economic Zone, internal sea waters and territorial sea of the Russian Federation.		
Purpose:	Spawning biomass and abundance estimating, oceanography		
Reported to:	PINRO survey report, JRNFC, ICES AFWG in 2011		

Nation:	Russia	Survey title:	Investigations for spawning and feeding migrations of herring in the Norwegian Sea
Reference No.:	R-2-10		
Organization:	PINRO		
Time period:	January-March August – September	Vessel:	rented trawlers
Target species:	Herring	Secondary species:	Blue whiting, mackerel,
Area:	North-East Atlantic, Faroese fishery zone, international waters of the Norwegian Sea, Spitsbergen area, Exclusive Economic Zone of Norway.		
Purpose:	Study of distribution and migration of spawning and feeding herring, collection of biological data		
Reported to:	PINRO survey report, ICES WGWIDE in 2011		

Nation:	Russia	Survey title:	Investigations of mackerel feeding migration
Reference No.:	R-2-11		
Organization:	PINRO		
Time period:	June-August	Vessel:	2 rented trawlers
Target species:	Mackerel	Secondary species:	Blue whiting, herring
Area:	North-East Atlantic, Faroese fishery zone, international waters of the Norwegian Sea, Spitsbergen area, Exclusive Economic Zone of Norway, Jan-Mayen fishery zone.		
Purpose:	Trawl-acoustic survey. Study of mackerel feeding migration and, spatial and temporal distribution of pelagic fish, oceanography and hydrobiology.		
Reported to:	PINRO survey report, ICES WGWIDE in 2011		

Nation:	Russia	Survey title:	Marine resource investigations of capelin for the collection of fisheries and biological information on the state of marine biological resources and the impact of fishery in order to develop measures aimed at conservation and comprehensive utilization of marine biological resources
Reference No.:	R-2-12		
Organization:	PINRO		
Time period:	October-December	Vessel:	2 rented trawlers
Target species:	Capelin	Secondary species:	Polar cod
Area:	The Barents Sea and adjacent waters, Spitsbergen area, "Grey zone", international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Collection of biological materials, studies of the distribution of feeding and wintering aggregations, studies of routes and rates of migrations depending on biological state of fish and environmental conditions. Assessment of abundance and biomass of fish from older age groups.		
Reported to:	PINRO survey report, JRNFC, ICES AFWG in 2012		

Nation:	Russia	Survey title:	Trawl-acoustic survey for redfish *(Sebastes mentella)* of the Norwegian-Barents Sea population.
Reference No.:	R-2-13		
Organization:	PINRO		
Time period:	April-May	Vessel:	R.V. "Fridtjof Nansen", R. V. "Vilnjus" or rented trawler
Target species:	Redfish (*S. mentella*), redfish (*S. marinus*),	Secondary species:	cod, haddock, Greenland halibut, northern wolffish and others
Area:	The Barents Sea and adjacent waters, Exclusive Economic Zone of Norway and Spitsbergen area		
Purpose:	Evaluation of strength of redfish yearclasses; study of distribution of redfish and other species; collection of biological data; evaluation of resources for fisheries through analysis and collection of statistical data on CPUE; oceanography.		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Investigation of intra-annual spatio-temporal distribution of elder cohorts of cod.
Reference No.:	R-2-14		
Organization:	VNIRO "National Fish Resources"		
Time period:	January-March, April-June, July-December	Vessel:	1 trawler, 1 long-liner
Targeting species:	Cod	Secondary species:	Haddock, Northern wolfish, spotted catfish, Greenland halibut, redfish (*S. mentella*), other demersal fish
Area:	Exclusive Economic Zone of Norway, Exclusive Economic Zone of the Russian Federation, Spitsbergen area and international waters		
Purpose:	Investigation of intra-annual spatio-temporal distribution of elder cohorts of cod basing on the synoptic monitoring methodology. Data collection of cod elder cohorts in the trawl and long-line catches for the assessment of the stock.		
Reported to:	«National Fish Resources», Federal Agency for Fisheries, VNIRO, PINRO		

Nation:	Russia	Survey title:	Investigation of the intra-annual spatio-temporal distribution of commercial concentrations of Greenland halibut depending on abiotic factors.
Reference No.:	R-2-15		
Organization:	VNIRO «National Fish Resources»		
Time period:	October-November	Vessel:	1 trawler
Target species:	Greenland halibut	Secondary species:	Cod, haddock, catfishes, redfish (*S. mentella*, *s.marinus*), other demersal fish
Area:	Exclusive Economic Zone of Norway and Spitsbergen area.		
Purpose:	Elaboration of recommendations for rational exploitation of the halibut stock by use of new informational technologies for analysis of spatio-temporal distribution of the commercial stocks depending on the variability of the abiothic factors.		
Reported to:	«National Fish Resources», Federal Agency for Fisheries, VNIRO, PINRO.		

Nation:	Russia	Survey title:	Investigation of spatio-temporal distribution of feeding aggregations of herring and blue whiting in the Norwegian Sea.
Reference No.:	R-2-16		
Organization:	VNIRO «National Fish Resources»		
Time period:	September-December	Vessel:	1 trawler
Targeting species:	Herring	Secondary species:	Blue-whiting, Mackerel
Area:	Norwegian Seas, including the waters under jurisdiction of the third countries, international waters.		
Purpose:	Investigation of herring and blue whiting in the Norwegian Sea. Spatio-temporal mapping of the blue whiting and herring distribution based on the synoptic monitoring methodology.		
Reported to:	«National Fish Resources», Federal Agency for Fisheries, VNIRO, PINRO.		

Nation:	Russia	Survey title:	Investigation of physical mechanisms of formation of high concentrations of feeding mackerel in the Norwegian Sea.
Reference No.:	R-2-17		
Organization:	VNIRO “National Fish Resources”		
Time period:	June-September	Vessel:	1 trawler
Targeting species:	Mackerel	Secondary species:	Blue whiting, herring
Area:	International waters of the Norwegian Sea.		
Purpose:	Investigation of spatio-temporal dynamics of distribution of mackerel commercial concentrations in relation with the weather conditions in the synoptic-scale variability, elaboration of short-term advices for the fishery.		
Reported to:	«National Fish Resources» survey report, Federal Agency for Fisheries, VNIRO, PINRO.		

Joint investigations

Nation:	Norway/Russia	Survey title:	Joint Russian-Norwegian multispecies trawl-acoustic survey for demersal fish stock assessment (Winter Survey)
Reference No.:	J-2-01*		
Organization:	IMR, PINRO		
Time period:	January-March	Vessel:	R.V. "Jan Mayen" R.V. "Johan Hjort" R.V. "Fridtjof Nansen" R.V. "Vilnjus"
Target species:	Cod, haddock, Greenland halibut, catfishes, saithe, redfishes	Secondary species:	Other demersal and pelagic species
Area:	The Barents Sea and adjacent waters, "Grey zone", 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:	Assessment of the yearclasses, abundance and biomass cod and haddock, other demersal species, collection of biological samples, oceanography.		
Reported to:	Joint IMR/PINRO Report Series, ICES AFWG in 2011		

* - Application for permission to entering in the Russian EEZ has already been sent for R.V. "Jan Mayen" without this reference number being known. This is an annual joint survey that will be given the same reference number in the future.

Nation:	Norway/Russia	Survey title:	International survey for blue whiting in the spawning areas west of the British Isles
Reference No.:	J-2-02		
Organization:	IMR, PINRO		
Time period:	March	Vessel:	R. V. "G. O. Sars" R.V. "Fridtjof Nansen" or R.V. "Vilnjus"
Target species:	Blue whiting	Secondary species:	herring, mackerel
Area:	North-East Atlantic, Norwegian Sea , international waters, , Exclusive Economic Zone of Norway, Faroese, UK and Ireland fishery zones, Rockall area		
Purpose:	Estimation of yearclasses, abundance, biomass and distribution of blue whiting, oceanography, plankton survey, oceanography.		
Reported to:	Joint IMR/PINRO survey report, ICES WGWIDE, ICES PGNAPES in 2011		

Nation:	Russia/Norway	Survey title:	International ecosystem survey in the Northern Seas
Reference No.:	J-2-03		
Organization:	PINRO, IMR		
Time period:	May – June	Vessel:	R. V. "Fridtjof Nansen", R.V."Vilnjus"
	May		R.V. "Johan Hjort" 3 other RVs
Target species:	Herring, blue whiting	Secondary species:	Other pelagic species
Area:	The Norwegian Sea, fishing zone of the Faroe Islands, international waters, Exclusive Economic Zone of Norway, UK fishery zone, The Barents Sea and adjacent waters, "Grey zone" , 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. Acoustic survey of the stocks, oceanography.		
Reported to:	PINRO, IMR survey reports, International report, ICES WGWIDE, ICES PGNAPES in 2011		

Nation:	Norway/Russia	Survey title:	Multispecies trawl-acoustic survey for pelagic species (herring, mackerel, blue whiting) in the Norwegian Sea
Reference No.:	J-2-04		
Organization:	IMR, PINRO		
Time period:	June - August	Vessel:	2 vessels chartered by IMR 1 rented trawler by PINRO
Target species:	Herring, blue whiting, Mackerel	Secondary species:	Other pelagic fishes, marine mammals, seabirds, chlorophyll, zooplankton, oceanographic parameters
Area:	North-East Atlantic, Faroese fishery zone, international waters of the Norwegian Sea, Spitsbergen area, Exclusive Economic Zone of Norway.		
Purpose:	Herring. Blue whiting and mackerel abundance and biomass assessment, studies of their distribution and behaviour, oceanography and plankton surveys.		
Reported to:	Joint IMR/PINRO survey report, ICES, NEAFC		

Nation:	Norway/Russia	Survey title:	Joint Russian-Norwegian ecosystem survey.
Reference No.:	J-2-05		
Organization:	IMR, PINRO		
Time period:	August-September	Vessel:	R.V. "G.O Sars" R.V. "Johan Hjort" R.V. "Jan Mayen" R.V. "Fridtjof Nansen" R.V. "Vilnjus" Airborne laboratory
Target species:	Cod, haddock, saithe, catfishes , redfishes, Greenland halibut, plaice, herring, capelin, polar cod, shrimp	Secondary species:	Other pelagic and demersal species, benthic organisms, sea mammals and birds, oceanographic and hydrobiological parameters
Area:	The Barents and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey zone", international waters, Exclusive Economic Zone of the Russian Federation , and territorial waters of the Russian Federation. The Kara Sea.		
Purpose:	Investigations of distribution and abundance of 0-group of different species, estimation of abundance and biomass of pelagic species, demersal species, shrimp, Greenland halibut juveniles. Oceanography, plankton, marine mammals, seabirds, species interactions, sampling for determining pollution levels.		
Reported to:	Joint IMR/PINRO Report Series, ICES in 2012, ACOM in autumn 2011, WGHARP, NAMMCO		

3. Research program on Greenland Halibut

The JRNFC take note of the final report from the three year research program on Greenland halibut. The report lists a number of recommendations regarding future research priorities for improved assessments. The Parties will continue to collaborate in age analyses, survey data sampling and analyses and improvement of assessment methodology. Validation of a method for age determination of Greenland halibut is a basic requirement for progress in any of these topics. The ICES age validation workshop WKARGH to be held in Vigo 14-17 February 2011 will address the problem and both Parties will contribute to find a new best practise. IMR will improve the survey series on adult Greenland halibut along the continental slope, and will for this reason start to use own research vessel ("G.O.Sars") instead of hired commercial trawlers. The Parties will also cooperate in bringing unpublished results from the three-year program all the way to publication in peer-reviewed journals.

4. Red king crab (*Paralithodes camtschaticus*)

Both Parties exchanged information about the ongoing national Red king crab research in 2010 and the plans for 2011.

According to Appendix 10 to the protocol of the 38th session of the JNRFC, the meeting of scientists in March 2010 adopted a new 3-year program on king and snow crabs, as follows:

PROGRAMME OF INVESTIGATIONS ON KING AND SNOW CRABS IN THE BARENTS SEA DURING THE PERIOD 2010-2012

RESEARCH OBJECTIVES

The scientists from Russia and Norway stated that not all the problems associated with the management and assessment of the crab stock, development of technical management measures, research of crab by-catch interaction problems between the king crab and the environment are resolved.

Therefore the main objectives of the joint investigations in 2010-2012 should be to:

- study impacts of the introduced crabs on the native fauna;
- improve methods for estimating abundance and stock structure of the red king crab stock;
- study the habitat of crabs in their new areas and preferences for environmental conditions;
- investigate the snow crab distribution in the Barents Sea;
- develop means of minimizing by-catches and improve size selectivity in the directed fishery for red king crabs.

METHODS AND CONTENT OF WORKS

In accordance with the research plans, the following work is planned:

- to continue investigations on the impacts of the red king crab on the ecosystem;
- to develop a comparative methodology for stock abundance estimation;
- to collect and process data on the red king crab stock status applying such methods as trawl and pot surveys, underwater TV, tagging experiments and biological and fisheries statistical data from commercial and other fisheries and diving operations;
- to continue a research fishery for red king crab to collect biological and fishery data;
- to record biological data on the introduced crabs, e.g. length-at-age, sex composition, molting stages, meat fullness, development stages of gonads, eggs, quantitative and qualitative feeding characteristics etc.
- to reveal spreading of the introduced crabs to new areas by tag-recapture methods.
- to study behaviour of the red king crab under natural conditions and in close vicinity of fishing gears. Remote (controllable underwater video-camera) and direct (observations by divers) visual methods will be applied in a whole range of the technically accessible depths;
- to carry out bottom fauna surveys in both economic zones with particular emphasis on effects of the red king crab;
- to perform stomach analysis to reveal potential predators on the crabs;
- to conduct investigations on larval distribution and adult crab habitat preferences;
- to conduct genetic studies on king and snow crabs from the Barents Sea for comparison with the same species from other areas;
- to perform full screening of all parasites and symbionts associated with introduced crabs in the Barents Sea;
- to develop means to minimize by-catch of red king crab in other fisheries.
- to continue the joint investigations on population genetics of the red king and snow crabs in the Barents Sea

EXPECTED RESULTS

- New knowledge on impact of the red king crab on the ecosystem.
- Improved stock assessment methodology.
- Data on diet composition, fecundity, moulting, growth rate, migrations, crab distribution and population genetics.
- New data on distribution and origin of the snow crab in the Barents Sea.
- Results from studies of the effect of fishery on the behaviour of the Barents Sea red king crab.
- An overview of all parasites associated with introduced crabs in the Barents Sea.
- Improved advice on management measures for red king crab stock and development of means to minimize red king crab by-catch in other fisheries.

Norwegian investigations

Nation:	Norway	Survey title:	Red king crab stock survey
Reference No.:	N-4-01		
Organization:	IMR		
Time period:	August-September	Vessel:	Hired vessel
Target species:	Red king crab	Secondary species:	
Area:	Fjords in Finnmark		
Purpose:	Abundance estimation and ecological investigations		
Reported to:	IMR survey report, PINRO and VNIRO		

Nation:	Norway	Survey title:	Red king crab distribution and abundance
Reference No.:	N-4-02		
Organization:	IMR		
Time period:	August-December	Vessel:	Hired vessels
Target species:	Red king crab	Secondary species:	
Area:	Off shore areas in Finnmark		
Purpose:	Abundance estimations and spreading of the crab		
Reported to:	IMR survey report, PINRO and VNIRO		

Russian investigations:

Nation:	Russia	Survey title:	Stock assessment of the red king crab by trawl survey
Reference No.:	R-4-01		
Organization:	PINRO		
Time period:	August-September	Vessel:	1 rented vessel
Target species:	Red king crab	Secondary species:	Snow crab, cod, haddock
Area:	The Barents Sea, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Assessment of the total, fishable and spawning stocks of the red king crab; study of the crab distribution; collection of biological data, crab tagging to study migration, oceanography, underwater video.		
Reported to:	PINRO survey report, IMR		

Nation:	Russia	Survey title:	Red king crab trap survey
Reference No.:	R-4-02		
Organization:	PINRO		
Time period:	August-September	Vessel:	2 rented vessels
Target species:	Red king crab	Secondary species:	Snow crab
Area:	The Barents Sea, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Assessment of the total, fishable and spawning stocks of the red king crab, comparison of stock estimates by trawl survey results, TAC estimation. Study of the distribution of red king crab. Collection of biological data, crab tagging to study migration, oceanography.		
Reported to:	PINRO survey report, IMR		

Nation:	Russia	Survey title:	Investigations aimed at elaboration of measures to decrease the red king crab by-catches in the trawl fishery for demersal fish.
Reference No.:	R-4-03		
Organization:	PINRO		
Time period:	August-November	Vessel:	1 rented vessel
Target species:	Red king crab	Secondary species:	Snow crab, Cod, haddock, catfishes and other demersal fish
Area:	The Barents Sea, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Search of means for minimization of the red king crab by-catches in fisheries for cod and haddock. Recommendations on improvement of trawl design.		
Reported to:	PINRO survey report, IMR		

Nation:	Russia	Survey title:	SCUBA-diving and trap survey of red king crab
Reference No.:	R-4-04		
Organization:	PINRO		
Time period:	July-August	Vessel:	R.V. “Professor Boiko” SCUBA-divers
Target species:	Red king crab	Secondary species:	
Area:	The Barents Sea, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Estimation of abundance and biological diversity in the coastal 7-mile zone of the Kola Peninsula. Calculation of abundance indices of the total and commercial stocks at 0-30 m and 30-150 m depth. Collection of biological data for the stock assessment and estimation of TAC.		
Reported to:	PINRO survey report, IMR		

Nation:	Russia	Survey title:	Marine resource investigations of the red king crab for the collection of fisheries
Reference No.:	R-4-05		and biological information on the state of marine biological resources and the impact of fisheries on these stocks in order to develop measures aimed at conservation and comprehensive utilization of marine biological resources.
Organization:	PINRO		
Time period:	January-December	Vessel:	5 rented vessels
Target species:	Red king crab	Secondary species:	Snow crab
Area:	The Barents and White Seas, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Studies of distribution, collection of biological material, development of advice on rational harvesting of the stock, tagging of crabs, studies of migrations, collection of CPUE data for different trap types, collection of oceanographic data.		
Reported to:	PINRO report		

5. Fishing technology and selectivity of fishing gears

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

- Fishing gears that are more species and size selective and that have less negative impact on fish that escape the gear, and have less negative ecosystem effects in general.
- Improved survey gears and methodology.

A special focus will be on a field experiment with sorting grid in bottom trawl for a directed fishery for Greenland halibut in Norwegian Economical Zone and Svalbard Area to be carried out in 2011. The sorting grid shall be of an appropriate design for use onboard Russian vessels, and the bar spacing to be tested shall be within an appropriate range, and with 130 mm mesh size in the cod end. The field experiment shall be conducted by a Russian vessel with participation of Russian and Norwegian scientists and science technicians. The design of the experiment shall be developed during the scientist meeting in March 2011. The experiments shall be reported to the Technical Working Group.

Norwegian investigations:

Nation:	Norway	Survey title:	Trials with norsel cod gillnets to reduce bycatch of kingcrab
Reference No.:	N-5-01		
Organization:	IMR		
Time period:	February - April	Vessel:	Hired vessel
Target species:	Cod King crab	Secondary species:	
Area:	Norwegian coast, Northern Norway		
Purpose:	Gill nets for reduced bycatch of king crab		
Reported to:	IMR survey report		

Nation:	Norway	Survey title:	Pair seining for cod-fishery based aquaculture
Reference No.:	N-5-02		
Organization:	IMR		
Time period:	All year	Vessel:	Hired vessel
Target species:	Cod	Secondary species:	
Area:	Norwegian coast, Northern Norway		
Purpose:	Pair seining for cod-fishery based aquaculture		
Reported to:	IMR survey report		

Nation:	Norway	Survey title:	Development of cod traps
Reference No.:	N-5-03		
Organization:	IMR		
Time period:	January, September	Vessel:	Hired vessel R/V "Fangst"
Target species:	Cod	Secondary species:	
Area:	Norwegian coast, Northern Norway		
Purpose:	Development of cod traps		
Reported to:	IMR survey report		

Nation:	Norway	Survey title:	Longline efficiency
Reference No.:	N-5-04		
Organization:	IMR		
Time period:	January	Vessel:	Hired vessel
Target species:		Secondary species:	
Area:	Norwegian coast, Northern Norway		
Purpose:	Longline efficiency		
Reported to:	IMR survey report		

Russian investigations:

Nation:	Russia	Survey title:	Comparative study of the Greenland halibut trawl and long-liner catchability in order to improve methods of stock assessment
Reference No.:	R-5-01		
Organization:	PINRO		
Time period:	May-November	Vessel:	1 rented trawler and 1 rented long-liner
Target species:	Greenland halibut, cod, haddock	Secondary species:	wolffish, redfish (*S.mentella*), long rough dab
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway Exclusive Economic Zone of Norway, "Grey zone", international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Improvement of stock assessment methods for Greenland halibut, estimation of comparative catchability of trawl and longline, comparative estimation of some factors related to the impact of longline and trawl fishery on marine biological resources, development of proposals on minimising their negative impact, collection of materials for the improvement of methods used in the trawl and longline survey of Greenland halibut.		
Reported to:	PINRO survey report, ICES AFWG in 2011 and 2012		

Nation:	Russia	Survey title:	Selectivity studies of new fishing gear and sorting systems.
Reference No.:	R-5-02		
Organization:	PINRO		
Time period:	January -December	Vessel:	2 rented trawlers and RV "Vilnius"
Target species:	Cod, haddock, northern wolffish, spotted catfish, Greenland halibut	Secondary species:	Saithe, plaice, long rough dab, red fishes, crabs , wolfish
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey Zone", international waters, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Estimation of results from the use of current technical regulations in the trawl fishery for cod, haddock and other fish species, improvement of measures to ensure rational harvesting of biological resources, development of substantiation for optimal technical regulations, estimation of efficiency of new selection systems, estimation of pelagic trawl selectivity in the fishery for cod and haddock		
Reported to:	PINRO survey report, JRNFC		

Nation:	Russia	Survey title:	Study of a possibility to use Danish seine and pelagic trawl for cod and haddock fishery
Reference No.:	R-5-03		
Organization:	PINRO		
Time period:	January-December	Vessel:	1 rented Danish seiner and 1 rented trawler
Target species:	Cod, haddock	Secondary species:	northern wolffish, spotted catfish, flatfishes, red fishes
Area:	The Barents Sea and adjacent waters, Spitsbergen area, Exclusive Economic Zone of Norway, "Grey Zone", international waters, Exclusive Economic Zone of the Russian Federation		
Purpose:	Evaluation of possibility and efficiency of using pelagic trawls equipped by selective devices in the fishery for cod and haddock in order to minimise the negative impact of fishery on bottom biocenoses. Investigation of possibilities and prospects of resource saving technology in the fishery with Danish seine		
Reported to:	PINRO survey report, JRNFC		

Joint investigations:

Nation:	Norway/ Russia	Survey title:	Crowding in herring purse seine fisheries
Reference No.:	J-5-01		
Organization:	IMR/PINRO		
Time period:	March - April	Vessel:	Hired vessel RV "Fangst"
Target species:	Herring	Secondary species:	
Area:	Norwegian coast		
Purpose:	Quantify unaccounted mortality of Norwegian spring spawning herring caused by crowding in purse seines		
Reported to:	IMR survey report, Joint IMR/PINRO report on SFI		

Nation:	Norway/ Russia	Survey title:	New purse seine fisheries
Reference No.:	J-5-02		
Organization:	IMR/PINRO		
Time period:	May - June	Vessel:	Hired vessel
Target species:	Herring	Secondary species:	
Area:	Norwegian coast		
Purpose:	Development of resource and environmental friendly purse seine fisheries		
Reported to:	IMR survey report, Joint IMR/PINRO report on SFI		

Nation:	Norway/ Russia	Survey title:	Low impact and selective trawling technology
Reference No.:	J-5-03		
Organization:	IMR/PINRO		
Time period:	October	Vessel:	RV "G.O.Sars"
Target species:	Cod	Secondary species:	Haddock, Saithe
Area:	Barents Sea		
Purpose:	Low impact and selective trawling technology		
Reported to:	IMR survey report, Joint IMR/PINRO report on SFI		

Nation:	Norway/ Russia	Survey title:	Low impact and selective trawling technology
Reference No.:	J-5-04		
Organization:	IMR/PINRO		
Time period:	May – June	Vessel:	RV "Fangst"
Target species:	Cod	Secondary species:	Haddock, Saithe
Area:	Norwegian coast		
Purpose:	Low impact and selective trawling technology		
Reported to:	IMR survey report, Joint IMR/PINRO report on SFI		

Nation:	Norway/ Russia	Survey title:	Low impact and selective trawling technology
Reference No.:	J-5-05		
Organization:	IMR/PINRO		
Time period:	October-November	Vessel:	Hired vessel
Target species:	Cod	Secondary species:	Haddock, Saithe
Area:	Barents Sea		
Purpose:	Low impact and selective trawling technology		
Reported to:	IMR survey report, Joint IMR/PINRO report on SFI		

Nation:	Norway/ Russia	Survey title:	Low impact and selective trawling technology
Reference No.:	J-5-06		
Organization:	IMR/PINRO		
Time period:	August	Vessel:	RV "Fangst"
Target species:	Cod	Secondary species:	Haddock, Saithe
Area:	Norwegian coast, Northern Norway		
Purpose:	Low impact and selective trawling technology		
Reported to:	IMR survey report, Joint IMR/PINRO report on SFI		

Nation:	Norway/Russia	Survey title:	Selectivity studies of fishing gear and sorting systems for Greenland Halibut
Reference No.:	J-5-07		
Organization:	IMR/PINRO		
Time period:	January -December	Vessel:	RF "Vilnius" or rented trawler
Target species:	Greenland halibut	Secondary species:	
Area:	The Barents Sea and adjacent waters, Spitsbergen area,		
Purpose:	Estimation of results from the use of current and new technical regulations in the trawl fishery for Greenland Halibut.		
Reported to:	IMR/PINRO survey report, JRNFC		

6. Optimal harvesting of commercial species in the Barents Sea ecosystem

The work of IMR and PINRO on the joint Program for estimation of optimal long-term harvest in the Barents Sea Ecosystem adopted at the 33rd session of the Commission continues.

During the last year further development of STOCOBAR model was conducted in PINRO. The results were presented at the symposium of EU project UNCOVER and ICES annual scientific conference. The comparative runs of STOCOBAR and Gadget models were performed according to the working plan adopted at the March meeting in the last year. The results are presented in the chapter 12 of the joint IMR and PINRO book that is in progress now. Investigations on modelling of cod maturation and sea mammal's predation were done by IMR.

ICES started in 2010 to give advice in relation to maximum sustainable yield. Therefore, most of the effort relating to long-term harvest has been aimed at preparation for MSY advice. Developing MSY reference points for the Barents Sea stocks is a major task and was not ready for inclusion in this year's advice. The aim is to have some proposals ready for the Arctic Fisheries Working Group in 2011.

The long-term project has also contributed to the work on technical regulations in the Barents Sea.

7. Monitoring of pollution levels in the Barents Sea

PINRO and IMR will continue to monitor pollution levels in accordance with national programs. Scientists from both institutes plan to discuss and exchange results from investigations during the meeting of scientists in March 2011.

The investigations of both countries are based on the material collected during the surveys in the Barents Sea (see chapter 2 of this appendix).

8. Investigations on age and growth of fish

The exchange of age reading specialists and material for cod, haddock, redfish and capelin will continue in the future according to the established routines. The percent agreement between the PINRO and IMR age readings on cod and haddock have stabilized in recent years, which suggests that annual meetings are not necessary. Considering this activity in cost-effective terms it is now correct to adjust the meeting (workshops) frequency to every second year. The next meetings for cod, haddock and capelin will be held in Murmansk in 2011. For Greenland halibut preparation work will be carried out for the ICES workshop on Greenland halibut which will be held in February 2011. There are still severe discrepancies in the age readings of redfish (*Sebastes*

mentella) despite the fact that both laboratories base the age reading on otoliths. As the difference is related to the ability of reading age of fish of 20 years and more, the ICES Arctic Fisheries Working Group urge the laboratories to soon solve the problem through regular otolith exchanges and comparative age readings between international experienced age readers.

9. Marine mammals

The effect of various marine mammal species, in particular harp seals, on biological resources of the Barents and Norwegian Seas is considerable. Besides, harp, hooded, grey and harbour seals and minke whales have traditionally been target species for hunt operations. Other species, such as white whales, ringed and bearded seals, may also be of potential future interest for hunting. There is therefore a need for joint research on marine mammals, including boat based and airborne surveys, in offshore as well as coastal areas. The joint Russian-Norwegian research 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 2011 include sampling of biological material from harp seals during commercial sealing in the south-eastern Barents Sea and analyses of biological material from hooded seals, collected during research surveys in the Greenland Sea. Surveys to estimate abundance of harbour seals will be carried out in Norwegian coastal areas, whereas line transect sighting surveys for minke whales (and other whales) will be conducted in the Norwegian Sea. Samples to assess minke whale diets will be obtained from the commercial hunt. Satellite tags will be deployed on minke whales and other whale species in Lofoten (spring) and Svalbard (autumn). Studies of harbour seal ecology will be conducted with telemetric tagging of seals, scat sampling and concurrent mapping of resources in the Porsangerfjord, Finnmark.

In 2011, the Russian Party will continue to carry out annual multispectral aerial surveys of harp seals of the White/Barents Seas population on their traditional whelping patches in the White Sea as well as in non-traditional areas in the northern and south-eastern (Pechora Sea) parts of the Barents Sea, and during their feeding migrations, using the Russian research aircraft. Besides, complex and dedicated aerial surveys are planned to study other marine mammal species distribution and numbers, and also information about the distribution of fish species. During the annual ecosystem surveys, sightings of marine mammals from research vessels and research aircraft will be conducted. In addition, annual coastal and vessel expeditions 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 commercial harp seal catch.

As part of the Joint Norwegian-Russian Research Program on Harp Seal Ecology, telemetric investigations of harp seals will be carried out in the White Sea in a joint Norwegian-Russian project. Alternatively, the parties agreed to organize a cruise in late May / early June in 2011, to deploy satellite tags on harp seals on ice in the northern Barents Sea. Joint observations of marine mammals on the ecosystem surveys will continue. If funding becomes available, it is planned to carry out aerial surveys to investigate whether relocation of breeding has occurred for parts of the harp and hooded seal populations in the Greenland Sea, and for harp seals in the Barents Sea. If new breeding patches are observed, this will have considerable implications for future research, management and hunting activities in the area.

Norwegian investigations

Nation:	Norway	Survey title:	Monitoring of harbor seal ecology
Reference No.:	N-9-01		
Organization:	IMR		
Time period:	January-October	Vessel:	Research vessel "Johan Ruud"
Target species:	Harbour seals	Secondary species:	
Area:	Norwegian coast (Porsangerfjord in Finnmark)		
Purpose:	Telemetric tagging of seals, scat sampling, concurrent estimates of prey availability, repeated surveys within the given period).		
Reported to:	IMR survey report, NAMMCO, ICES		

Nation:	Norway	Survey title:	Monitoring of biological parameters in harp seals
Reference No.:	N-9-02		
Organization:	IMR		
Time period:	March-May	Vessel:	1 sealer
Target species:	Harp seal	Secondary species:	
Area:	Southeastern part of the Barents Sea		
Purpose:	Collection of biological material from harp seals during commercial sealing.		
Reported to:	ICES, NAMMCO, JNRFC		

Nation:	Norway	Survey title:	Aerial survey harbour seals
Reference No.:	N-9-03		
Organization:	IMR		
Time period:	August-September	Vessel:	Rented airplane
Target species:	Harbour seals	Secondary species:	
Area:	Norwegian coast		
Purpose:	Aerial photographic survey to obtain total abundance of harbour seals during moult.		
Reported to:	NAMMCO, ICES		

Nation:	Norway	Survey title:	Line transect surveys of minke whales
Reference No.:	N-9-04		
Organization:	IMR		
Time period:	July - August	Vessel:	2 rented vessels
Target species:	Minke whales	Secondary species:	Other large whales
Area:	The Norwegian Sea (eastern part, including the Norwegian coast, management area EW)		
Purpose:	Sighting surveys to assess abundance of minke whales, and abundance, distribution and species composition of other marine mammals.		
Reported to:	IWC, NAMMCO		

Nation:	Norway	Survey title:	Telemetric tagging of minke whales
Reference No.:	N-9-05		
Organization:	IMR		
Time period:	April-May	Vessel:	1 rented vessel
Target species:	Minke whales	Secondary species:	
Area:	Lofoten		
Purpose:	Telemetric tagging of minke whales.		
Reported to:	IWC, NAMMCO		

Nation:	Norway	Survey title:	Telemetric tagging of minke whales
Reference No.:	N-9-06		
Organization:	IMR		
Time period:	August-September	Vessel:	1 rented vessel
Target species:	Minke whales	Secondary species: Humpback whales	
Area:	Svalbard		
Purpose:	Telemetric tagging of minke whales.		
Reported to:	IWC, NAMMCO		

Nation:	Norway	Survey title:	Ecological studies of minke whales
Reference No.:	N-9-07		
Organization:	IMR		
Time period:	May-July	Vessel:	Whalers
Target species:	Minke whales	Secondary species:	
Area:	Norwegian coast - Barents Sea - Spitsbergen		
Purpose:	Collection of material from whales taken in commercial hunt, material to assess diet.		
Reported to:	IWC, NAMMCO		

Joint Norwegian/Russian investigations:

Nation:	Norway/Russia	Survey title:	Aerial survey to assess possible new harp and hooded seals breeding patches
Reference No.:	J-9-01		
Organization:	IMR, PINRO		
Time period:	March-April	Vessel:	Russian research aircraft
Target species:	Harp and hooded seals	Secondary species:	Other seal species, whales
Area:	The Denmark Strait		
Purpose:	To assess if harp and hooded seals may have established new breeding areas south of those traditionally used by the two species for breeding purposes in the Greenland Sea. The driving force behind such a shift maybe ice reductions.		
Reported to:	Joint IMR/PINRO survey report, JRNFC, ICES WGHARP, ICES AFWG, ICES WGMME, NAMMCO.		

Nation:	Russia/Norway	Survey title:	Harp seal tagging in the White Sea in the frames of marine mammals coastal research
Reference No.:	J-9-02		
Organization:	PINRO, IMR		
Time period:	February-May	Vessel:	1 helicopter, vessel, boats
Target species:	Harp seal	Secondary species:	Other seal species, whales
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 mammals monitoring, assessment of marine mammals influence on fish species, assessment of climatic changes and human activities on marine mammals		
Reported to:	Joint IMR/PINRO survey report, JNRFC, ICES WGHARP, ICES AFWG, ICES WGMME, NAMMCO		

Nation:	Norway/Russia	Survey title:	Tagging of harp seals with satellite tags
Reference No.:	J-9-03		
Organization:	IMR, PINRO		
Time period:	May-June	Vessel:	Rented vessel
Target species:	Harp seal	Secondary species:	Other seal species, whales
Area:	Northern Barents Sea		
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 mammals monitoring, assessment of marine mammals on fish species, assessment of climatic changes and human activities on marine mammals		
Reported to:	Joint IMR/PINRO survey report, JNRFC, ICES WGHARP, ICES AFWG, ICES WGMME, NAMMCO		

Russian investigations:

Nation:	Russia	Survey title:	Multispectral aerial survey of harp seal whelping and moulting patches
Reference No.:	R-9-01		
Organization:	PINRO		
Time period:	March-April	Vessel:	Research aircraft
Target species:	Harp seal	Secondary species:	White whale and other species of marine mammals
Area:	The White Sea and the Barents Sea, Exclusive Economic Zone of the Russian Federation, internal sea waters and territorial sea of the Russian Federation		
Purpose:	Study of distribution and estimation of number of the White Sea harp seal on whelping patches for estimation of pup production aiming at stock abundance assessment, study of harp seal ecology and their influence on fish species as top predators.		
Reported to:	PINRO survey report, ICES WGHARP, ICES AFWG, ICES WGMME, JRNFC, NAMMCO		

Nation:	Russia	Survey title:	Investigation of reproduction biology and ecology of harp seal in the White Sea in the frames of marine mammals coastal research
Reference No.:	R-9-02		
Organization:	PINRO		
Time period:	February-May	Vessel:	Coastal and ice hunting, 1 sealer or research vessel boats and small boats.
Target species:	Harp seal	Secondary species:	Bearded, ringed, grey, common seal, white whale and other species of marine mammals
Area:	The White Sea, Barents Sea, Kara Sea, Laptev Sea		
Purpose:	Investigation of biology and ecology of harp seal in the White Sea, estimation of number of animals in the populations, marine mammals monitoring, assessment of marine mammals influence on fish species, assessment of climatic changes and human activities on marine mammals, data for the ecosystem modeling.		
Reported to:	PINRO survey report, ICES WGHARP, ICES WGMME, ICES AFWG, JRNFC, NAMMCO		

Nation:	Russia	Survey title:	Marine mammals coastal research and observations in the White Sea and Barents Sea
Reference No.:	R-9-03		
Organization:	PINRO		
Time period:	April-September	Vessel:	Coastal expedition with the use of available transport and different types of boats
Target species:	Harp seal, Minke whale, ringed and bearded Seals	Secondary species:	Other species of marine mammals and fishes
Area:	Coast of the Barents and White Seas		
Purpose:	Collection of biological data, study of distribution and migration routes, estimation of number, marine mammals monitoring, assessment of marine mammals influence on fish species, assessment of climatic changes and human activities on marine mammals, data for the ecosystem modelling.		
Reported to:	Internal PINRO survey report, ICES WGHARP, ICES AFWG, ICES WGMME, NAMMCO, JRNFC		

Nation:	Russia	Survey title:	Comprehensive aerial survey of marine mammal resources in the Barents Sea, Kara Sea and Laptev Sea
Reference No.:	R-9-04		
Organization:	PINRO		
Time period:	July-September	Vessel:	Research aircraft
Target species:	Minke whale humpback whale, white-beaked dolphin, white whale	Secondary species:	Harp seal, walrus and other species of *Cetacea* and *Pinnipedia*, seabirds, fish schools
Area:	The Barents Sea		
Purpose:	Study of the effect of marine mammals and seabirds distribution and abundance including information about fish species distribution for understanding of the effect of marine mammals and seabirds on the main commercial fishes for further use in ecosystem models for management of commercial living marine resources.		
Reported to:	PINRO survey report, JRNFC, ICES AFWG, ICES WGMME, NAMMCO		

Nation:	Russia	Survey title:	Marine mammals sightings and observations in the open sea and coastal zone
Reference No.:	R-9-05		
Organization:	PINRO		
Time period:	January-October	Vessel:	Research and fisheries vessels, boats and small boats Research aircraft
Target species:	Minke whale. killer whale, humpback whale, white-beaked dolphin, white-sided dolphin, northern bottlenose whale, white whale	Secondary species:	All other species of marine mammals, seabirds, oceanographic and hydrobiological parameter
Area:	The White and Barents Seas		
Purpose:	Marine mammals study of main biological parameters, distribution and numbers assessment with habitat taking into account and marine mammals and seabirds influence on the main commercial fishes for further use in ecosystem models for management of commercial living marine resources.		
Reported to:	PINRO survey report, ICES AFWG, ICES WGMME, JRNFC, NAMMCO		

10. Investigations on survey methodology

The long-term objective of the work is a transition to absolute abundance estimates of fish stocks including acoustic estimate of target strength and catchability of fishing gears.

It is necessary to develop a common methodology of acoustic estimation of target strength (TS) of fish and to examine a possibility to establish a joint database on TS estimates.

There is a need to continue investigations trawl catchability differentiated coefficients for fish of different sizes including the use of underwater video and acoustic methods.

The future investigations in these issues will be discussed by correspondence and during the March meeting 2011.

11. Russian-Norwegian Fisheries Science Symposia

The 14th Russian-Norwegian Symposium shall be arranged in Norway in 2011. The topic is to be on the "Climate change effects on the Barents Sea marine living resources", in the venues of UNIS (University Studies at Svalbard) in Longyearbyen, Svalbard, 6-9 September 2011. The scientific sessions will be held during two full working days on 7 and 8 September.

The scope of the symposium will deal on how the long term climate changes imply increased temperatures, less ice and a warmer ocean in the Barents Sea area. However, a special challenge in analyzing the Barents Sea ecosystem is that the short-term trend (since 2006) shows decreasing temperatures and increasing sea ice cover. The Russian-Norwegian Symposium 2011 aims to address question related to these long and short term variations, and ask what these physical changes really are, and how they may protrude into the future. Furthermore, the question is raised as to how these assumed climate driven physical changes may change the ecosystems, and what implications and future challenges this represents for the management of the resources in the area.

The symposium includes three theme sessions:

Theme 1: What are the changes?
Theme 2: What effects can be expected on the ecosystem?
Theme 3: Management implications and challenges.

The symposium language is English, and Proceedings of the symposium will be edited by the Norwegian part of the symposium program committee, and published in the IMR/PINRO Joint Report Series. If a sufficient number of presentations has a content and quality that would merit more than merely printing in the traditional Proceedings, selected papers from the symposium will get the opportunity to be published in a peer reviewed scientific journal, presumably in a special issue of the journal Marine Biology Research. Other journals may be considered.

12. Development of an exchange program of scientists

In 2006 it was suggested to develop a program for exchange of scientists between PINRO, VNIRO and IMR, on all levels (students – research technicians – senior scientists).

The program will be further developed in 2011 and considered during the March meeting. The program should include exchange of scientists between the institutions at their laboratories and at their research vessels during investigations. The institutions will agree on the program before its implementation.

13. Development of joint assessment model for herring stock

The new assessment model for the Norwegian spring spawning herring stock (TASACS) has been successfully developed and applied in WGWIDE in 2009-2010. Further development will be needed to take into account ecosystem aspects.

14. Joint three-year program on benthic animals

In the frame of traditional March meeting of PINRO and IMR a benthic workshop has took place in Tromsø on the 15 March 2010.

In the workshop the current state of benthic investigation in PINRO and IMR was presented and the perspective of joint monitoring activities was discussed.

The meeting has defined milestones and goals for coming years for the continuation of the By-Catch/PINRO historical stations and the publication of the data.

PINRO covers the Russian part of the Barents Sea in 2010 and coming years with the By-catch program. IMR covers the Norwegian part of the Barents Sea.

From 2010 PINRO will sample grab in the standard station of the Kola Section annually.

It was established that the collection of PINRO historical stations is completed.

The processing of PINRO historical grab and Sigsby/Beamtrawl samples to species level will continue both on IMR and PINRO.

15. Determination of conversion factors for cod, haddock and other gadoids

Scientific and research institutes of Russia and Norway continue investigations on establishing accurate conversion factors for products produced at sea from cod and haddock.

Accurate conversion factors are necessary in order to estimate the actual catches of the joint stocks of cod and haddock. 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 cod and haddock during fishing operations onboard Norwegian or Russian vessels taking into account annual, biological variations and effects of fishing gear and technological processing equipment.

Joint investigation:

Nation:	Russia/Norway	Survey title:	Cod and haddock conversion factors
Reference No.:	J-15-01		
Organization:	PINRO, VNIRO, Norw. Dir. of Fisheries.,		
Time period:	January - April	Vessel:	Rented longliner
Target species:	Cod, haddock	Secondary species:	
Area:	Exclusive Economic Zone of Norway		
Purpose:	To conduct experimental and checking works, to determine conversion factors.		
Reported to:	Surveys reports, Norw. Dir. of Fisheries, VNIRO, PINRO.		

Nation:	Russia/Norway	Survey title:	Cod and haddock conversion factors
Reference No.:	J-15-02		
Organization:	PINRO, VNIRO, Norw. Dir. of Fisheries,		
Time period:	September - December	Vessel:	Rented trawler
Target species:	Cod, haddock	Secondary species:	
Area:	Exclusive Economic Zone of the Russian Federation		
Purpose:	To conduct experimental and checking works, to determine conversion factors.		
Reported to:	Surveys reports, Norw. Dir. of Fisheries, VNIRO, PINRO.		

16. Joint project "The Barents Sea Ecosystem Book"

In 2007 Russian and Norwegian scientists agreed to begin works on a joint book summarizing 50-year experience of research and management of stocks in the Barents Sea.

The original plan was to have the book printed in time for presenting it at the meeting of the JNRFC in October 2010. This required that everything was delivered to the printers by April. However, the process is behind schedule. The main reason for this is that the time needed for preparing a joint chapter by authors from somewhat different cultures concerning publications was underestimated. Furthermore, with 56 chapters and nearly one hundred authors involved there would almost certainly be some logistic problems, e.g. people quitting or going on temporary leave, which would delay the work on some chapters, and in some cases it has been necessary to bring in new authors at a fairly late stage to get the work finished. In the spring, the editorial group therefore agreed to abandon the original plan and instead aim for printing early in 2011. This would mean delivery to the printers by the end of 2010.

A contract has been signed with the Tapir Academic Press in Trondheim, Norway to take care of the layout and the printing of the book. The contract is valid for 2010, but the printers are informed about the delay and extending the contract to 2011 is not expected to be a problem. There is also a contract with a language consultant, Mr Hugh Allen, to correct the language and to help with the editorial work. At present he has dealt with about 1/3 of the chapters and is expected to go through the rest within a few weeks. This contract is covered by funds obtained from the Norwegian Ministry of Foreign Affairs.

There is recently published another book on the Barents Sea: "Ecosystem Barents Sea". This book has a somewhat different focus than the present book, and it was felt a bit unfortunate to have two books with virtually the same title published within such a short time period. A new title is therefore suggested: "The Barents Sea: Ecosystem, Resources and Management – Half a Century of Russian-Norwegian Cooperation".

It was proposed and agreed to ask the respective ministries to write an introductory note to the book. The foreword has been discussed and agreed by the co-chairmen of the Joint Fisheries Commission, Jørn Krog and Andrey Krainiy.

17. Development of joint genetic database for Atlantic salmon populations.

During the March Meeting in 2009 Russian and Norwegian scientists agreed to begin developing a joint genetic database for Atlantic salmon. This work will both expand the existing genetic baseline in northern Norway, as well as analyze samples from a number of Russian rivers with the objective of developing a model for coastal migration of returning spawners to the northern salmon rivers and providing a more informed basis for the management of the coastal fisheries.

DNA will be extracted from the samples using methods yielding high quality DNA for later storage and the DNA analyzed for variation of microsatellite markers. IMR will conduct genetic analyses of the samples and provide PINRO with the data from the analysis. The subsequent interpretation of the data will be conducted in collaboration.
Samples collected from Norwegian rivers will be stored at NINA or IMR (depending on where extraction and analysis is conducted). Both samples and DNA will be made available for other laboratories for further analyses in the future.

Samples collected in Russia will be divided in two where possible, and stored both at PINRO and IMR. The ownership of the samples and DNA will remain with PINRO. Further use of the samples and DNA must be made through agreement with PINRO.

The data from the analysis, both from Russian and Norwegian samples, will be entered into the trans-European database being developed for SALSEA-Merge (NASCO), and made available for the purposes of the SALSEA-Merge project. Further use of the data outside the realm of SALSEA-Merge will be possible after agreement with the partners. The data from the analysis will also be used by a relevant partner for constructing a national genetic baseline for Atlantic salmon populations.

18. Investigations of cartilaginous fishes in Barents Sea

Russian and Norwegian scientists noted the importance of cartilaginous fishes (sharks, skates, ratfishes) in the Barents Sea ecosystem and their vulnerability to fisheries, as well as lacking scientific knowledge with respect to those species. Therefore the scientists expressed their intention to enhance their studies of cartilaginous fishes and to instruct the responsible Russian and Norwegian institutes to develop a plan for investigations of cartilaginous fishes in the Barents Sea.

19. Catch volumes needed for investigations of marine resources and monitoring of the most important commercial species, as well as management tasks

The catch volumes shall enable each party to carry out all tasks described in "Joint Norwegian – Russian Scientific Research Program on Living Marine Resources in 2011" 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 I and II including respective EEZs of Russia and Norway, "Grey zone", international waters ("Loophole") and Spitsbergen area.

To solve these tasks the following catch quantities are decided for each party for 2011:

- 7 000 tonnes of cod in addition to volumes mentioned in Appendix 3
- 4 000 tonnes of haddock in addition to volumes mentioned in Appendix 3
- 5 000 tonnes of capelin in addition to volumes mentioned in Appendix 3
- 1 600 tonnes of Greenland halibut for Russia and 750 tonnes of Greenland halibut for Norway as mentioned in Appendix 3
- 2 500 tonnes of other fish species in addition to volumes mentioned in Appendix 6, as follows:
  - Saithe - 250
  - Redfish *S. mentella* - 100
  - Redfish *S. marinus* - 30
  - Northern wolffish - 850
  - Spotted catfish - 640
  - Atlantic wolffish - 5
  - Long rough dab - 120
  - Skates - 5
  - Sea plaice - 500

Both Parties will make all efforts to fulfill their respective parts of the program.

If needed, an additional scientific catch quantity of capelin can be allocated.

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