

## ОБЗОРЫ. REVIEWS

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### Review of fishing in the Arctic waters



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**Abstract.** Today the enclave of the central part of the Arctic Ocean is closed by ice for any industrial activity. However, if the process of warming goes on, countries will have a real prospect for development of large-scale economic activities in the area, including commercial fishing. The article offers cross-section of the major activities in 2015 aimed at the establishment of an international multilateral convention on fishery management and scientific fishery research in the Arctic region. The cooperation of the Arctic Council countries in the field of fisheries in the framework of international agreements is considered, as well as the species composition of fish of the Arctic seas is given.

**Keywords:** *Arctic, the Arctic Ocean, enclave of the central part, fishing potential, fishery*

The relevance of research is determined by the increasing importance of international cooperation in the sphere of fishing in the northern seas, especially in the central part of the Arctic Ocean (AO) in connection with the ongoing climate changes and intensive melting of ice in the Arctic. The scope of fishing in the waters of the Arctic Ocean is currently governed by a number of international conventions (treaties, agreements, commissions, organizations), which mostly do not have a direct relation to the entire Arctic basin.

Among of them are: Northwest Atlantic Fisheries Organization (NAFO) — organization on fishing in the north-west Atlantic; North-East Atlantic Fisheries Commission (NEAFC) — regulating fishing in the North-East Atlantic; international treaties on marine mammal hunting regulations. The Pacific Convention of the North-West Pacific (including Bering Sea, Sea of Okhotsk and other seas) is also partially related to the fishery in the Arctic region. North Pacific Anadromous Fish Commission (NPAFC) regulates the research and management of salmon and trout stocks. The member countries of the Commission are Canada, Japan, Republic of Korea, the Russian Federation and the United States.

It must be borne in mind that international fishing conventions regulate those enclaves and sea fishing areas, which are not included in the special economic zones (SEZ) of the coastal

countries. Accordingly, it is just coastal countries develop the "rules of the game." Other states wishing to fish in areas of use of the international conventions, should comply with these rules.

The quotas for the Atlantic herring, ocean perch, mackerel are set in NEAFC Convention area for Russia. The development of blue whittings and deep-sea fisheries has good prospects for Russia here. In NAFO Russia is among the member countries that have priority in getting the largest fishing quotas. Russia is a member of NPAFC since salmon inhabit near Chukotka and from there comes to the Laptev Sea and other Russian waters. Thanks to the membership in NPAFC, Russia, with research of other countries (Canada, USA and Japan) forms forecasts for salmon approaches for the Russian fishermen. During the years of NPAFC activity, the state of salmon stocks has been improved, in the first place — of humpback salmon and red blueback [1, Okhanov A.A., p. 16].

In 2015, in accordance with international agreements in the field of fishing and preservation of aquatic biological resources (ABR), Russia got quotas for catch of ABR in the exclusive economic zones of foreign states (hereinafter — the EEZs of foreign countries) — 354.1 thousand tons and in convention areas — 297.2 thousand tons. The catch by the Russian vessels in 2015 in the EEZs of foreign countries amounted to 457.9 thousand tons of ABR, in the convention areas - 254.6 thousand tons, which amounted in total 712.5 thousand tons<sup>1</sup>. The mutual two-way exchange of quotas is implemented between the countries included in the Arctic Council. The fishing industry of the Russian Arctic zone accounts for up to 15% of the total volume of catches of aquatic biological resources and fishery products produced in the Russian Federation [2, Kochemasov U.V, Morgunov B.A., Solomatin V.I].

### ***Cooperation between Russia and the countries of the Arctic Council in the field of fisheries***

Russia's cooperation with the countries of the Arctic Council in the context of the mutual exchange of quotas in fisheries currently looks incoherently. For example, Russia does not have active fishing resource sharing with the US, Canada, Finland, Sweden, but there is cooperation on conservation, joint research of ABR (aquatic biological resources), the conclusion of the international convention on the central part of the Arctic Ocean, the fight against illegal fishing of aquatic biological resources (IUU fishing).

***Russia — USA.*** The cooperation with the USA is very important for Russia in the eastern part of the Russian Arctic waters and adjacent to them high seas areas. In 1988, the Soviet Union signed the agreement with the USA on mutual relations in the field of fisheries. The US-Russia

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<sup>1</sup> Itogi deiatel'nosti Federal'nogo agentstva po rybolovstvu v 2015 godu i zadachi na 2016 god. p.11. URL: [http://fish.gov.ru/files/documents/ob\\_agentstve/kollegiya/itogi\\_2015\\_zadachi\\_2016.pdf](http://fish.gov.ru/files/documents/ob_agentstve/kollegiya/itogi_2015_zadachi_2016.pdf) (Accessed: 16 October 2016).

Intergovernmental Consultative Committee (ICC) on fisheries has been formed and is working actively. By now (October 2016) already 27 sessions of ICC have been hold. In 2009, in order to preserve the USA's unique Arctic ecosystem, the USA established the moratorium on all fisheries in the Arctic part of their EEZ. September 11, 2015 in Portland, at the 26th session of the ICC, Russia and the US signed an agreement on cooperation in fight against illegal, unregulated fishing of aquatic biological resources (IUU fishing)<sup>2</sup>.

The RF and the USA use the information exchange for combating with poaching. There is mutual provision of data on the import of marine biological resources, discharge of products of sea fishing, violations and suspicious ships.

Competent authorities in the RF are Federal Security Service and the Federal Customs Service, in the United States — the National Office for the Study of Ocean and Atmosphere and the Coast Guards. As part of the annual sessions of the ICC on fisheries, these bodies carry out consultations on cooperation in preventing, deterring and eliminating of IUU fishing. At the 27th session of the Russian-American ICC on fisheries, held on 27-28 September, 2016, in Vladivostok, the possibilities of organizing of joint research in 2017 in the Bering and Chukchee Seas were discussed<sup>3</sup>.

**Russia — Canada.** Already in the late 1990s Canada imposed a ban on all foreign fishing in their zone, including the issuance of paid licenses. Within the Arctic Ocean and its seas Canada has never led an active fishing of ABR. In 2014, Canada announced the Arctic fisheries management plan to ensure the sustainability of stocks for the indigenous population. The new fisheries management plan is designed to protect more than 800 thousand km<sup>2</sup> of the Canadian waters of the Beaufort Sea from the large-scale commercial fishing and to ensure sustainability of the resource for local residents<sup>4</sup>. In accordance with the plan, potentially future commercial fishing in this region will be possible only as a scientific research of stock assessment.

**Russia — Norway.** The permanent Russian-Norwegian Committee on management and control issues in the field of fisheries; the Russian-Norwegian working group on the development of common technical measures regulating fishing in the Barents and Norwegian Seas; the Working Group on conversion factors for the products from the jointly managed stocks of aquatic

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<sup>2</sup> Rossiia i SShA zakliuchili antibrakon'erskoe soglashenie. URL: <http://fishnews.ru/news/26998> (Accessed: 14 October 2016).

<sup>3</sup> Rossiia prodolzhaet tesno rabotat' s SShA po izucheniiu i okhrane resursov severnykh morei. URL: <http://www.tinro-center.ru/home/novosti/rossiaprodlzaettesnorabotatssapoizuceniuiokhraneresursovsevernyhmorej> (Accessed: 16 October 2016).

<sup>4</sup> Promyshlennoe rybolovstvo v arkticheskikh raionakh Kanady mozhetsia tol'ko s soglasiia aborigenov / 19 noiabria 2014. URL: [http://www.fishnet.ru/news/syrievaya\\_baza/44600.html](http://www.fishnet.ru/news/syrievaya_baza/44600.html) (Accessed: 16 October 2016).

bioresources of the Barents and Norwegian Seas; Joint Norwegian-Russian Fisheries Commission function nowadays. Russian and Norwegian fisheries are mainly concentrated in the Barents and Norwegian Seas, are regulated by the exchange quotas. The main objects of these fishing - cod, haddock, halibut, herring, capelin, shrimp, whittings, catfish and flounder. The most valuable commercial species in both countries is the Atlantic cod. Norwegian fishermen catch mainly cod, haddock and northern shrimp in the Russian waters. Russia annually allocates to Norway 7000 heads of harp seals. The main objects of the Russian fishery in Norwegian waters are cod, haddock, saithe, herring, catfish and two species of redfish - *Sebastes mentella* and golden. The annual volume of shrimp (about 40 ths. tons) is underexploited by countries. [3, Glubokov A.I., Afanasyev P.K., Melnikov S.P., pp. 3-6]. In 2013, the main catch of aquatic biological resources in the EEZs of foreign countries arranged by Russian vessels accounted for Atlantic-Scandinavian herring, its catch in Norwegian zone, in the area of Svalbard, Jan Mayen and in the open area of the North-East Atlantic amounted to 78.3 thousand tons<sup>5</sup>. In October 2015 Federal Agency for Fishery and the Ministry of Climate and Environment of Norway signed a memorandum of mutual understanding in cooperation in the field of management issues, monitoring and research of wild Atlantic salmon in Finnmark and Murmansk region<sup>6</sup>.

Particularly noteworthy are some aspects of cooperation between Russia and Norway in Svalbard, which has a special status. On the one hand, the archipelago is under Norwegian jurisdiction, but on the other hand, Norway is obliged to comply with the terms of Spitsbergen Treaty, signed in Paris in 1920. Despite the sovereignty of Norway over the archipelago, all the participants of the Treaty of Paris — more than 50 countries — have the right to carry out economic activities, including fishing in the territorial waters of Svalbard. Now here the most intense fishing is arranged by Russia (up to 60% of catch), Norway, the EU member states, Iceland, the Faroe Islands and Greenland. In the area of Spitsbergen Russian fishermen extract about 80 thousand tons of ABR, in the area of Jan Mayen up to 15 thousand tons. Main objects of fishing in these waters are more than 100 tons of herring, about 13 tons of saithe and up to 3 tons of catfish. At the same time, the Norwegian fishing rules in these waters are observed, constantly cases of arrests and penalizing of Russian ships by Norwegian Coast Quards happen. [4, Zilanov V.K., pp. 9-14]. Portsel A.K. in his monograph emphasizes that the introduction of Norway in 1977 of the legislation on the 200-mile fishery protection zone around Svalbard is not consistent with

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<sup>5</sup> Itogi deiatel'nosti federal'nogo agentstva po rybolovstvu v 2013 g. i zadachi na 2014 g. URL: [http://www.fish.gov.ru/files/documents/ob\\_agentstve/kollegiya/Materialy\\_k\\_zasedaniyu\\_Kollegii\\_Itoги\\_deyatelnosti\\_Federalnogo\\_agentstva\\_po\\_rybolovstvu\\_v\\_2013\\_godu\\_i\\_zadachi\\_na\\_2014\\_god.pdf](http://www.fish.gov.ru/files/documents/ob_agentstve/kollegiya/Materialy_k_zasedaniyu_Kollegii_Itoги_deyatelnosti_Federalnogo_agentstva_po_rybolovstvu_v_2013_godu_i_zadachi_na_2014_god.pdf) (Accessed: 14 October 2016).

<sup>6</sup> Rosrybolovstvo raskritikovalo Norvegiu za vylov dikogo lososia. URL: <https://lenta.ru/news/2016/03/15/stopsalmon/> (Accessed: 14 October 2016).

international law [5, Portsel A.K., pp. 51-54]. Many experts say about the need for more vigorous defense of Russia's economic interests in Svalbard, particularly in the field of fisheries<sup>7</sup>. Zilanov V.K. and others share the view that the areas outside the territorial waters of Svalbard are international waters, where fishing regulations should be applied, which were developed by the Norwegian-Russian Fisheries Commission (the stocks of cod, haddock, halibut, capelin, opilio crab are regulated) or NEAFC.

**Russia — Denmark.** Russia with Denmark have joint quotas, Denmark here represents Greenland and the Faroe Islands. In the framework of international agreements, Greenland allows Russian fishermen to catch the redfish and black halibut in its economic zone, as well as the possibility to catch 10% of demersal species. The volume of Russian catch in the EEZ of Greenland on the main object of black halibut fishery is about 3-4 thousand tons. Since 2013, Russian fishermen in Greenland EEZ also fish mackerel and herring on commercial contracts. Greenland vessels in the Russian economic zone in the Barents Sea takes cod, haddock and shrimp. During the Russian-Greenland consultations the number of vessels of each of the countries that can receive the permit to fish, is agreed, as well as the number of ships that can be present simultaneously (to fish) in the fishing zone of the country.

In this direction it is important for Russia to increase the exchange Russian quotas on bass and halibut. For Greenland, which is the country with shrimp tradition, with most modern fishing technology of shrimp, the possibility of development of the Russian Barents Sea shrimp fishery is interested, where its fishery is at a very low level, and consists of only a third of the recommended by TAC science. In this context Greenland has good prospects for the development of shrimp fishing in the Russian waters. In EEZ of the Faroe Islands the Russian fishermen produce about 70 thousand tons of ABR, a large proportion of the catch falls on blue whittings — up to 50 tons and mackerel — up to 20 tons. In favorable years, Russian quotas in number of these species, may be increased.

**Russia — Iceland.** In December 2015, the 15th session of the Joint Russian-Icelandic Fisheries Commission was held in the capital of Iceland. International cooperation in the fishing sector between our countries is based on the existing tripartite agreement between Russia, Norway and Iceland dated 15 May 1999. It concerns the allocation for the Icelandic fishing vessels of quotas for cod, haddock and other ABRs (catfish, American plaice, plaice) in the Russian EEZ in the Barents Sea. The countries annually analyze the results of the fulfillment of "Coordinated

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<sup>7</sup> Interesy rybakov v vodakh Shpitsbergena nuzhdaiutsia v zashchite. URL: <http://fishnews.ru/news/27580> (Accessed: 14 October 2016).

report of agreements between Russia and Iceland on issues related to satellite ship tracking system", they discuss the issues of bilateral scientific and technical cooperation, as well as the results of the activities of two countries in international fisheries organizations NAFO and NEAFC. For example, in NEAFC area Iceland provides the right for Russian fishermen to catch herring, and we give them the right to catch cod.

***The open sea of the central part of the Arctic Ocean: on the way to conclusion of a convention***

We are talking about an enclave in the Arctic Ocean, located outside the 200-mile economic zones of the Arctic states, with a total area of 2.8 million sq. km (Fig. 1).



Figure 1. The international waters of the Arctic (in the center).

URL: [http://img.rg.ru/pril/article/73/12/92/vodi\\_arktiki-600.jpg](http://img.rg.ru/pril/article/73/12/92/vodi_arktiki-600.jpg)

According to the legal status, the central part of the Arctic ocean is the open sea for all countries, fisheries management here should be based on the UN Law of the Sea (UNCLOS — United Nations Convention on the Law of the Sea) of 1982 and other international legal instruments [6, Bekyashev K.]. Since 2010, the issues of the conservation of fish stocks of the central part of the Arctic Ocean are discussed in the framework of multilateral and bilateral



consultations of the representatives and experts of the Arctic Ocean coastal states — Canada, Denmark, Norway, Russia and the United States. Multilateral consultations were held in Oslo (Norway) in 2010, in Anchorage (Alaska, USA) in 2011, in Washington (USA) in April — May 2013 and in Nuuk (Greenland, Kingdom of Denmark) in November 2013 [7, Zagorski A.V., Glubokov A.I., Khmeleva E.N., p. 26]. The US offered Russia to come up with a mutual initiative to create in the region the international convention for the regulation of fish stocks<sup>8</sup>.

However, adhering to the principle that before introducing any prohibitions and restrictions, such a necessity must be proven and scientifically proved. Russia decided at that time to take waiting position. Federal Agency for Fishery Rosrybolovstvo in all international organizations traditionally adheres to the principle — research and study must be the first, then regulation. Several international conferences, multilateral consultations were held, regular expert meetings were organized, and the issue has moved from a dead point. Despite a lot of nuances and contradictions, the countries have begun to seek compromise wordings.

At the international conference of RIAC "The Arctic: the region of development and cooperation" on December 4, 2013 in Moscow, the Foundation Pew Charitable Trusts (Pew) together with representatives of the US State Department offered to sign the international agreement, which would allow to control fishing in the arctic enclave located outside the EEZ of the subarctic states. The proposal was unanimously supported by the experts - members of the RIAC conference.

In addition, the journal "Arctic and North" has already predicted that "the bear's skin is sold before one has caught the bear" as the Arctic enclave has not been free from ice and ABR in this part of the Arctic Ocean have not been actually studied.

It was proposed to identify the specific steps (roadmap) for: 1) the study of the stocks of the biological resources of the Arctic Ocean in conditions of the climate change (both warming and cooling); 2) the development and negotiation of international legal mechanism for controlling commercial fishing, taking into account the existing UNCLOS (1982); 3) adoption and public discussion of options for the International Arctic Fisheries Agreement — the introduction of a voluntary moratorium on the extraction in the open sea before obtaining the necessary scientific data on stocks of ABR.

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<sup>8</sup> Antibrakon'erskoe soglasenie s SSHa na podkhode. 13 sent. 2011 g. URL: <http://fishnews.ru/news/16560> (Accessed: 17 October 2016).

The moratorium in the international waters of the Arctic must be supported at least declaratively, by all the Arctic G20<sup>9</sup>.

The question of the correlation of the definition of the "international waters of the Arctic Ocean" with the term the "continental shelf" also needed to be clarified. "International Arctic waters" — is enclave located outside the EEZ of the subarctic states. However, according to the UN Convention on the Law of the Sea (1982) outside the EEZ there is also the continental Arctic shelf. All the subarctic countries de facto have established their exclusive economic zones. The main "apple of discord" in the Arctic Ocean is now the continental shelf, the seabed. The disputed waters between three countries are shown in Figure 2.



Figure 2. The disputed waters of the Arctic ocean between Canada, Denmark and Russia (highlighted in red at the center).

URL: <http://www.dur.ac.uk/ibru/resources/arctic/>

The international borders research center of Durham University (IBRU, Durham University).

In order to find a compromise, the US even offered not to include the Svalbard area in the new convention area of responsibility, but in this case only a region covered with ice falls under regulation actually. And it is not very clear now how fast the warming process will go. As scientists

<sup>9</sup> Lukin Iu.F. Miagkaia sila v Arktike: kontrol' rybolovstva v tsirkumpoliarnoi zone. 15.12.2013 // Arktika i Sever: Arkticheskie novosti. URL: [http://narfu.ru/aan/news.php?ELEMENT\\_ID=98068](http://narfu.ru/aan/news.php?ELEMENT_ID=98068) (Accessed: 15 October 2016).



are still arguing: some say that there is a global warming and the Arctic Ocean is gradually released from the ice, every five years the temperature increases by 1-1.5 degrees, while others believe that it is a natural cycle: now there is a warming era, but then inevitably the era of cold weather will come. Now the Central Arctic is closed with ice for any industrial activity. And even if the area of the Arctic ice continues to shrink, commercial fishing will be possible only for a few weeks per year, during the short Arctic summer. It is unclear whether the southern species which go up due to warming, will be able to gain a foothold in the region with its extreme conditions in sufficient volumes for industrial fishing. Therefore, the question of economically viable fishing in the central Arctic is a matter of time, which needs caution.

July 16, 2015 in Oslo five subarctic states (Russia, Canada, Denmark, Norway and the United States) signed the Declaration on the prevention of unregulated fishing in the central part of the Arctic Ocean. The Declaration stated that industrial fishing in the open sea area of the central part of the Arctic today and in the near future is improbable. In this regard, the need for establishing a regional fisheries management organization in the region is absent.

However, in order to deter uncontrolled fishing in the area in the future, the countries will temporarily adhere to the principle not to allow commercial fishing without informing regional or sub-regional organizations or any other arrangements. And for the period of the moratorium, it is necessary to focus on research in the enclave. Thus, during the voluntary restriction, the countries will have to form a common understanding of the ecology in the area and its resources. In addition, indigenous peoples will be able to play an active role in decision making on the use of the resource base of the Arctic, those indigenous peoples who have a wide representation in the Arctic Council<sup>10</sup>.

December 1-3, 2015 in Washington the first round of negotiations on an agreement on the conservation of fishery resources in the high seas area of the central part of the Arctic Ocean was held. However, to be valid for all other countries outside the Arctic, for the moratorium adopted on July 16, 2015 by the "Arctic Five", at a meeting in Washington not only representatives of the Arctic countries were invited, but also those who have interests in the region: China, South Korea, Japan, Iceland and the EU.

From 19 to 21 April 2016, in Washington the second round of negotiations on the prevention of unregulated commercial fishing in the high seas area of the central part of the Arctic Ocean took place. The delegations of Canada, Norway, the USA, Russia, Denmark (Greenland), China, the

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<sup>10</sup> Priarkticheskie gosudarstva podpisali deklaratsiiu o predotvrashchenii nereguliruemogo promysla v Arktike. URL: <http://fish.gov.ru/press-tsentr/novosti/5508-priarkticheskie-gosudarstva-podpisali-deklaratsiyu-o-predot-vrashchenii-nereguliruemogo-promysla-v-arktike> (Accessed: 30 January 2016).

European Union, Iceland, Japan, Republic of Korea took part in the meeting. In general, they supported the temporal measures to prevent IUU fishing in the central Arctic enclave, but differed in their views on their format. In this regard, at the meeting in Washington three areas of possible actions were considered: 1) adoption of the extended declaration, in addition to which besides five subarctic states, the other leading fishing powers will join — China, Japan, South Korea, Iceland and the EU; 2) the signing of legally binding agreement between all participants of the negotiations on ban of the commercial fishing in the Arctic enclave until obtaining sufficient information about fish stocks and determining the legal regulation in this area; 3) the possibility of creating a new regional fisheries management organization in the central part of the Arctic Ocean in the near future. Countries-participants expressed understanding that such temporal measures should include the ecosystem and precautionary approaches in combination with traditional and local knowledge<sup>11</sup>.

### ***Fisheries research in the Arctic***

14 subordinate organizations of the Federal Agency for Fisheries conducted scientific fisheries research in 2015: FSBSI "RFRIFO", "SFC", "PRIFO Center", "Kamchatka RIFO", "Magadan RIFO", "Polar Research Institute of Marine Fisheries and Oceanography", "SakhRIFO" etc.

Fishery science in 2015 paid attention to the research of the state of aquatic bioresources, as well as clarifying the TAC for the current year and the preparation of the forecast of harvest of aquatic biological resources in 2016r.

The Pacific Research Institute of Fisheries and Oceanography, PRIFO Center, has successfully conducted complex fishery investigations of aquatic biological resources of the Arctic waters in accordance with new five-year program from 2014<sup>12</sup>.

The first in the history of industry research, expedition of research vessel "TINRO" in the East Siberian Sea and the Laptev Sea, from 1 June to 25 October, 2015, provided unique data on their hydrology, fishery and biology. Arctic polar cod become a dominant. In the southern part of the East Siberian Sea, the scientists met with 11 species of fish with a total biomass of 695.3 tons. The most numerous was the polar cod (60.7% of considered biomass) and capelin (16%). In the Laptev Sea, the most common fish was also Polar cod (about 130 ths. tons, almost 99% of the total considered fish fauna).

In general, the species composition of fish in the Laptev Sea is rich. The total biomass of shellfish in the area of work was estimated about 216 tons. On the continental slope within the

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<sup>11</sup> Rybolovstvo v Arktike: ot diplomatii k nauke. URL: <http://www.fishnotice.com/news?idnews=362948> (Accessed: 15 October 2016).

<sup>12</sup> TINRO-Tsentr v pervye provel kompleksnye issledovaniia v Arktike URL: <http://www.fish-expert.pro/record/statja/analitika/tinro-tcentr-vpervye-provyol-kompleksnye-issled-r10420> (Accessed: 04 February 2016).

maximum surveyed depths (400-504 m) black halibut was found, which was a mystery to scientists, it was conjectured that it penetrates into the Laptev Sea from the Atlantic<sup>13</sup>. PRIFO Center specialists also managed to make a large-scale bottom filming in the north-western part of the Bering Sea, which showed that stocks of cod, halibut, grenadier and flatfish remain at a good level. The biomass of cod in the area of Anadyr and Chukotka zone was estimated as 680 thousand tons. Black halibut biomass was 36.7 thousand tons, but in the course of the filming the reduction in number of individuals of younger ages was observed. According to the results of a bottom trawl survey, total wall-eyed Pollack biomass was estimated as 2.7 million tonnes. Experts estimated the biomass of herring in the West Bering Sea zone at 860 thousand tones, which corresponds to its successful fishing. Blue crab stocks increased in 3 times. The total number of fishing crab in the Bering Sea amounted to 3.8 billion exemplars with biomass of 266 thousand tons. As for shrimp met in the north-western part of the Bering Sea, there two most widespread types: humpy shrimp (37.8 thousand tons) and northern shrimp (20.3 thousand tons)<sup>14</sup>. In 2015, PRIFO Center continued working on monitoring the state of the habitat of aquatic biological resources of the Far Eastern seas, the expedition to the eastern sector of the Arctic (the Laptev Sea and East Siberian sea) was conducted.

Lusin Institute for Economic Studies (Kola Scientific Center of RAS) conducted research in the Western Arctic and to developed proposals promoting efficiency and competitiveness of the fishing industry in the Arctic, including the development of coastal fisheries at new industrial basis, carried out a comparative analysis of the economic efficiency of the Russian export (Murmansk region) with Norway of the main valuable commercial fish: cod, haddock and saithe<sup>15</sup>.

In 2015 Polar Research Institute of Marine Fisheries and Oceanography made the assessment of ABR and their habitats in the Barents, White, Kara Seas to prove the Russian position in the ICES, NEAFC, NAFO, the bilateral Intergovernmental Commissions on Fisheries and other international events. According to research results in 2015, the impact of economic activities on the state of commercial bioresources and their habitats was within the natural fluctuations in the White Sea, in the south-eastern part of the Barents Sea, in the south-western part of the Kara Sea and freshwater reservoirs of their basins. In 2015, at the trout farm, placed in the Kandalaksha

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<sup>13</sup> TINRO-Tsentr podvel itogi unikal'noi ekspeditsii. URL: <http://fishnews.ru/news/27595> (Accessed: 01 February 2016).

<sup>14</sup> ibidem

<sup>15</sup> Otchet o NIR po teme «Nauchnye i prikladnye osnovy gos. politiki funktsionirovaniia resursno-syr'evoi ekonomiki na shel'fe i v pribrezhnoi zone Rossiiskoi Arktiki v usloviakh globalizatsii. Apatity, 2015 URL: <http://www.iep.kolasc.net.ru/vasnir2015.pdf> (Accessed: 16 October 2016).

Bay of the White Sea, rainbow trout with an average weight of 1900-2700 g, was raised during one growing season<sup>16</sup>.

Ministry of Natural Resources of RF at the end of 2015 approved the list of species of flora and fauna that are indicators of a steady state of marine ecosystems of the Arctic zone of the Russian Federation<sup>17</sup>.

Indicator species include living organisms responding to environmental changes by their presence or absence, appearance, chemical composition, behavior. With the use of environmental monitoring indicator species often gives more valuable information than direct assessment with the help of special devices, since indicators react immediately to the entire impact system. In addition, having a "memory", such organisms reflect by their reactions the pollution for a long period. The list was approved by order of the Ministry of Natural Resources of the RF dated 22 October № 25-p. It consists of 61 items. List of fish includes the Asian toothy, nine-and three-spined smelt, Arctic cod, various types of saffron cod and the northern slope. List of shellfish — crab spider and copepods. Mammals — Polar bear, walrus, ringed seal, beluga and bowhead whale. Also — brown, red, green, diatoms and dinoflagellates, sea squirts, chaetognaths, polychaete worms, echinoderms, mollusks and birds. The list is recommended for oil and gas companies that develop deposits on the Arctic continental shelf, in the internal sea waters, territorial sea and the adjacent zone of Russia. The document is proposed to use as a basis for the development of programs for the conservation of biological diversity.

In general, the Russia needs its own state program of study of aquatic bioresources in the Arctic. There is now such a comprehensive national program until now. Existing state programs related to fisheries, do not solve this problem. The Audit Chamber analyzing the performance of SP of Russia "Development of the Fisheries Industry" for 2013-2020, noted that "35 from 39 target indicators do not meet the requirement of reliability included in subprograms (89% in total)"<sup>18</sup>.

Among the non-Arctic countries, South Korea is going to actively study the Arctic. In this country there is a network of South Korean research institutions, bringing together about 30 organizations. the Minister of Maritime Affairs and Fisheries of South Korea, Yoo Gi Jung announced the creating of scientific consortium, on September 30, 2015. A landmark in this work

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<sup>16</sup> Itogi deiatel'nosti Federal'nogo agentstva po rybolovstvu v 2015 godu i zadachi na 2016 god, p.33, 72 URL: [http://fish.gov.ru/files/documents/ob\\_agentstve/kollegiya/itogi\\_2015\\_zadachi\\_2016.pdf](http://fish.gov.ru/files/documents/ob_agentstve/kollegiya/itogi_2015_zadachi_2016.pdf) (Accessed: 16.10. 2016).

<sup>17</sup> Rasporiazhenie Minprirody Rossii ot 22.09.2015 № 25-r «Ob utverzhdenii perechnia vidov flory i fauny, iavliaushchikhsia indikatorami ustoichivogo sostoianiia morskikh ekosistem AZRF». URL: <http://www.mnr.gov.ru/regulatory/detail.php?ID=142243> (Accessed: 30.01.2016)

<sup>18</sup> Gosudarstvennaia programma Rossiiskoi Federatsii «Razvitie rybokhoziaistvennogo kompleksa» // Informatsiia po itogam ekspertizy gosudarstvennykh programm RF po sostoianiiu na 1 iunia 2014 g. Schetnaia palata RF: Biulleten'. Spetsvypusk. p. 73–74

will be the creation of the Consortium of the US Arctic Research in 1988 and the Japanese consortium of the Arctic environmental research in 2011. With scientific activity, the South Korea hopes to overcome the geographical restriction, not allowing it to participate actively in the development of the Arctic, where part of the water area is the exclusive economic zones of five Arctic states.

### *Conclusion*

Thus, the central part of the Arctic Ocean is not currently regulated by international convention on fisheries. US hasten other coastal states to accept such an agreement and jointly sign regulations, so that countries, that are not related to the Arctic enclave in the central part of the Arctic Ocean, can not arrange exploration and development of mineral resources under the guise of fishing. Today the area is still covered with ice, and the subject of regulation of the proposed agreement is in the process of creation.

Meanwhile, fears of the Arctic countries continue to grow. Exploration survey, scientific research of resources is governed by the laws of the special economic zones and a coastal country has the right to deny another country to conduct such types of work. And this happens in most cases.

The complexity of the monitoring of the Arctic region requires effective coordination of the Arctic states and third countries in conducting research programs, and filming. To assess the possible scenarios of future changes in the Arctic ecosystems and the spatial distribution of species it is necessary to develop mathematical models. In the new future, scientists will have to answer such questions as: are there fish resources in the enclave of the central part of the Arctic Ocean which are potentially suitable for industrial fishing? If such resources are available, whether they can be used consistently with respect to the target resource and the ecosystem as a whole? What are the prospects for the development of fisheries in the central part of the Arctic Ocean in the future? What changes in stocks of ABR and their dependent species, as well as supporting ecosystems in the central part of the Arctic Ocean and the surrounding areas may occur in the next 20-30 years? How the legal status of the central part of the Arctic continental shelf will be regulated, taking into account the division of the continental shelf between Denmark, Canada, Russia, in accordance with the existing UNCLOS 1982 (The United Nations Convention on the Law of the Sea)? Despite the fact that the active fishing in the high seas area of the central part of the Arctic ocean is hardly possible in the near future, climatic and environmental conditions set new realities for fishing in the economic zones of five subarctic states where commercial fishing is actively carried out and and international cooperation is developed.

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