THE VERTICAL DISTRIBUTION OF EGGS AND LARVAE OF WALLEYE POLLOCK

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Studies have shown that the vertical distribution of eggs and larvae of walleye pollock within the boundaries of the shelf and beyond varies considerably. If the offshore development of eggs takes place in the surface layers, the outside of the shelf, mesopelagic, at depths of 200– 500 m and more. The larvae of walleye pollock in the early stages of development in the shelf zone are found in layers of 10–50 m, and with the development of sink deeper horizons. The speed of the vertical drift of eggs after spawning significantly more in the shelf zone, with an average of 2 mm/s, whereas mesopelagic it is much lower. Larvae pollock are expressed daily rhythm, which consists in the fact that they are avoiding the maximum and minimum luminance. Various environmental conditions under which the spawning and development of eggs and larvae allow walleye pollock occupy ecological niches located in the epipelagic, mesopelagic and pelagic zone and to ensure the rapid growht of abundance.

Keywords: vertical distribution of eggs, larvae, pollock, epipelagic, pelagic, mezopelagial, environmental conditions, development, layers, horizons.

PROSPECTS OF SNOW CRAB *CHIONOECETES OPILIO* FISHERY IN THE BARENTS SEA

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This paper describes current state of snow crab stock in the Barents Sea along with the factors affecting the process of its acclimatization. Potential areas of commercial aggregations and the range of introduced crab under its full naturalization were assessed based on simulation of the species spatial distribution. At the moment crab's distribution square is approximately 760 000 km2 or 30% of the Barents Sea water area. However potential of further crab's settlement is not fully achieved. Results of international and domestic fisheries in the Barents Sea region (2013–2016) showed good development prospects of its harvest. Current commercial snow crab stock is estimated at 400 000 tones with a possibility of annual catch of about 40–80 000 tones. Further growth of the stock is possible due to increase of population abundance within the existing range or due to the range expansion.

Keywords: snow crab, the Barents Sea, stock, fishery.

THE STATE OF STOCKS OF THE MAIN COMMERCIAL FISH SPECIES IN LADOGA LAKE

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The influence of fishery on the state of fish stock and catch volume in Ladoga Lake was considered on the base of commercial catches analysis for the last 70 years. A decrease of salmonid and coregonid fish species catches was revealed. It was found that catches of vendance, smelt, burbot and zander varies considerably, while commercial stock of roach, perch and others was underused. Possible causes of reduction in catches of the main commercial fish species were analyzed.

Recommendations for sustainable management of aquatic biological resources were represented.
Keywords: Ladoga Lake, fishery, commercial species, catches dynamics, recommendation.

BLACK SEA GRASS PRAWN *PALAEMON ADSPERSUS* (DECAPODA, PALAEMONIDAE): BIOLOGY, FISHERIES AND PROBLEMS

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The article is devoted to the peculiarities of the distribution and biology of the Black Sea grass prawn (Baltic prawn) *Palaemon adspersus*. The results of studies of the size composition of males and females, fertility, features of spawning and seasonal migrations of this species in the coastal zone of Crimea in the Karkinitsky Gulf have been given. The peak of spawning is observed in May and June; the initial fecundity of females depending on their total length in the range of 48–63.4 mm increases from 549 to 2281 eggs per one female. Information about fishery of the prawn in the Black Sea, the Sea of Azov have been presented. Catches of the Black Sea grass prawn in the Crimea in 2016 amounted to approximately 80 tons. It is proposed to change the timing of the ban catch Black Sea grass prawn, setting it from 15 April to 15 July; fees to determine the size of the penalties of her illegal fishing to calculate catch per unit of mass – one kilogramm.
Keywords: Black Sea grass prawn, *Palaemon adspersus*, distribution, biology, fishing, Rules of fishing, compensation of damage, Crimea, Black Sea.

COMPARATIVE EVALUATION OF HYDROLOGIC-HYDROCHEMICAL STATE OF THE WATER RESERVOIRS IN THE NOVOMOSKOVSK AREA OF THE TULA REGION IN AUTUMN

© 2017 y. S.A. Lapin

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Current condition of the Shatskoye and Lubovskoye reservoirs is described based on results of hydrological-hydrochemical survey. The reservoirs are under heavy anthropogenic press due to many years of industrial exploitation. The analysis is conducted in comparison with the neighboring Pronskoye reservoir which performs without any industrial press. The former reservoirs are subject of reorientation to recreational and fishery water bodies. Yet it is substantiated that the process is in the very first phase.
Keywords: reservoir, hydrology, hydrochemistry, ion composition.

COMPARATIVE ANALYSIS OF LINEAR GROWTH OF ARCTIC CISCO *COREGONUS AUTUMNALIS AUTUMNALIS* (COREGONIDAE) FROM DIFFERENT AREAS OF THE BARENTS AND KARA SEAS

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According to the reverse calculation of body length, a comparative analysis of the rate of linear growth of the arctic cisco Coregonus autumnalis autumnalis (Pallas, 1776) from various areas of the Barents (western border of its natural range) and the Kara Sea was carried out. In the course of study, the differences in the rate of growth of the Arctic omul from the river Usa and the basin of the western coast of the Yamal Peninsula, from the omul Ob river and Gydansky mouth, as well as the Yenisei river was taken. It was revealed that the most significant differences in growth are manifested in the first years of the life of the Omul, which is due to the peculiarities of its feeding and reproduction.

Keywords: Arctic cisco, the river Pechora, the river Usa, the river Sil-Yakha, lip Krusenstern, the Gulf of Ob, Gydanskaya lip, the river Yenisei reverse calculations, the rate of linear growth.

FATTY ACIDS IN THE BARENTS SEA RED KING CRAB HEMOLYMPH

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The investigation of fatty acids composition of hemolymph of the red king crab in the Barents Sea was undertaken. The main part of fatty acids was polyunsaturated fatty acids, at the second place – saturated fatty acids, at the third place – monounsaturated fatty acids. New results were compared with literature data. It was shown that size, sex, molting stage, limb injury level of crabs as well as egg condition (in females) had no effects on the fatty acid concentrations in the hemolymph.

Keywords: red king crab, Barents Sea, hemolymph, fatty acids.

CURRENT STATE AND FORECASTING WALLEYE POLLOCK MARKETS DEVELOPMENT

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Current state and future of the Russian Far East Pollock market development is analyzed below. Comparison of the current state of the Russian Pollock fishery and processing to the East Bering Sea Pollock processing in the USA also is produced here. Main export flows for this kinds of Pollock products are shown with perspective fish markets of future sales. The main domestic fishery market aspects such as market capacity, range of possible goods, essential features of pricing and possibilities for market development are analyzed in this article. Estimations of raw pollock goods income for different kinds of products are presented here.

Keywords: pollock, Russian Far East fishing grounds, fish processing, sale markets, range of goods, development.

FISHERIES STATISTICS AS INDICATOR OF STOCK ASSESSMENT OF MARINE INVERTEBRATES

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This paper discusses applicability of fisheries statistics for marine invertebrates stock assessment. Advantages, disadvantages, limitations and possible sources of uncertainties of fisheries statistics are analyzed. The different methods of CPUE standardization are proposed for different stocks of marine invertebrates. The minimum significant number of CPUE queries from the Data Base should be not less than 10. Together with traditional methods of spatial and temporal divisions of annual data, the new method for definition of seasons based on pairwise comparison of catches in neighbor months is proposed. Effect of "vessel factor" on integral estimation of CPUE and involving this factor in analysis of catches dynamics by GLM (general linear models) method is discussed.

Keywords: commercial crabs and king crabs, stock assessment and forecast, fishery management, standardization, general linear models.

ONE OF THE METHODS TO DETERMINE VITAL RECEPTION CAPACITY OF WATER OBJECTS OB-IRTYSH BASIN

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One of the methods of determining vital reception capacity of water bodies is discussed in the article. It is proposed to use the retrospective analysis of dynamics of fish quantity, the existing regularity in fluctuation of the same age generations as well as ongoing changes in habitat and reproduction.

Keywords: environment capacity, vital reception capacity, restoration of biological resources, the lack of fingerlings.