CONCEPTUAL NOTES ON THE MANAGEMENT OF BIOLOGICALRESOURCES, RATIONAL AND SUSTAINABLE FISHERIES

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The article provides a critical analysis of existing approaches to the practice of fishery management and sustainable use of biological resources. The conclusion is that sustainable fishing could be achieved just by set harvesting quotas for long-lived hydrobionts, but it is unrealistic for fluctuating species which consist base of modern fishing resource. Sustainability of fisheries resource according to the principles of the ecosystem approach could be enhanced by the involvement of potentially commercial species of fish and non-fish species (especially those in the lower and middle trophic levels), as well as pasture aquaculture and complex of conservation measures and improving management.

Keywords: sustainable fisheries, management of biological resources, the total allowable catch, fluctuations abundance, multispecies fisheries, fishery resource.

KALMAN FILTER APPLICATION IN COHORT MODEL FOR ADJUSTING STOCK ASSESSMENTS IN THE CASE OF UNREPORTED CATCH

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This article presents the analysis and adjustment of stock assessments in the cohort model. It was found that a standard cohort model could be used to evaluate stock with a bias in the case of systematic errors in the annual catch data. The Kalman filter promotes elimination of this bias. The use of Kalman filter for adjusting stock assessments and a total allowable catch when new data appear is discussed. A method of standardizing stock index using this filter is proposed. Along with the stated topic, some questions on testing the models are considered.

Keywords: cohort model, Kalman filter, stock assessment.

INVESTIGATIONS OF THE GROWTH OF *CHLAMYS ISLANDICA* IN THE BARENTS AND WHITE SEAS USING DIFFERENT AGE READING METHODS

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Basic on growth parameters of Iceland scallop from the Barents and White Seas have been investigated using three aging methods. The most reliable results have been obtained in

the process of age determination using ligament. Shellfish has a maximum age of 34 years. Maximum rate of linear growth of Iceland scallop is observed at the age of 4‑8 years, increase in weight ‑ at the age of 6‑13 years. Growth rate of shellfish in the Barents Sea depends mainly on the temperature conditions of waters and in the White Sea ‑ on the salinity of the waters. Method for determination of age structure of the settlements according to the length composition has been proposed.

Keywords: Iceland scallop *Chlamys islandica*, the Barents Sea, the White Sea, growth parameters, maximum age.

DEVELOPMENT TRAWL METHOD OF ESTIMATE FISH STOCKS BY MEANS OF BATHYMETRICAL ZONING

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The paper presents a method of estimating the abundance of marine stocks fish through bottom trawling method using bathymetrical zoning waters of distribution. Limit reference points for dividing the waters of the shooting in this method are the abiotic factors – water depth and temperature.

Keywords: estimate stocks, Northeast Arctic cod, the Barents Sea, water depth, water temperature, bathymetrical zoning.

NEW INFORMATION ON THE PACIFIC COD *GADUS MACROCEPHALUS* IN THE NORTH -EASTERN WATERS OF SAKHALIN ISLAND

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The Pacific cod is distributed on north-eastern shelf of Sakhalin Island during warm season of the year. There are two groups of fish in this area with different growth rates observed according to length-age structure of the cod. Species' spawning ground is absent that indicates the possibility of adult fish migrations from the neibour sites of the Sea of Okhotsk.

Keywords: Pacific cod, eastern Sakhalin, growth rate, population groups.

CHANGE OF INFLUENCE ON GROWTH OF YOUNG FISHES OF FISHES OF SOME ECOLOGICAL FACTORS IN THE COURSE OF FORMATION OF THE ECOSYSTEM OF KUIBYSHEV WATER RESERVOIR

© 2015 y. V. A. Kuznetsov, V. V. Kuznetsov

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Indexes of growth of this year's broods of some kinds of fish of different ecological groups in phases of relative stabilisation (1967–1974) and destabilizations (1985–2012) ecosystems of the Kuibyshev water reservoir depending on ecological factors are surveyed. It is shown that in the season of relative stabilisation the length and mass of a body of this year's broods of fish authentically positively depended on duration of a growing season taking into account water temperature and is negative – from young fishes aggregate number. In the destabilization season the communications lost the crucial importance.

Keywords: growth of this year's broods of fish, ecological factors, a water reservoir.

DETERMINATION OF THE LENGTH BY WHICH THE REDLIP MULLET *LIZA HAEMATOCHEILUS* (MUGILIFORMES: MUGILIDAE) REACHES SEXUAL MATURITY IN THE SEA OF AZOV

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Sexual maturation of redlip mullet *Liza haematocheilus* in relation to its length was studied for the Sea of Azov. Using the probit analysis, the standard length, which 50% of individuals are mature at, was estimated for males, females and both genders altogether. Significant difference in length, which males and females maturate at, was identified. The comparison of minimum landing size of redlip mullet in the Sea of Azov with the length, which 50% individuals are mature at, estimated these values to be quite close to each other for two genders taken altogether. However, minimum landing size is significantly lower than the length, which 50% females are mature at.

Keywords: redlip mullet, *Liza haematocheilus*, sexual maturity, the Sea of Azov.

SEASONAL DYNAMICS OF ZOOPLANKTON in VOLGA stretch OF THE KUIBYSHEV RESERVOIR IN 2014

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The article assesses the qualitative and quantitative composition of zooplankton on the basis of hydrobiological studies in the Volga reach Kuibyshev reservoir in 2014. Zooplankton is

represented by rotifers, copepods and cladocerans. In the spring, in number and biomass is dominated by copepods, in the summer – cladocerans, in the fall in numbers is dominated by cladocerans and copepods in biomass. According saprobiological analysis over the entire study period the Volga reach Kuibyshev reservoir can be attributed to the group of β-mesosaprobic reservoirs.

Keywords: Kuibyshev reservoir, the Volga stretch, zooplankton, aquatic resources, food supply, aquatic organisms.

THE STUDY OF MICROELEMENT COMPOSITION OF TISSUES AND ORGANS OF SOME COMMERCIAL FISH FROM THE GULF OF PETER THE GREAT (SEA OF JAPAN)

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The content of some trace elements in muscle, gills, sexual gland and liver of a pollock *Theragra chalcogramma*, saffron cod *Eleginus gracilis*, rudd *Tribolodon brandtii*, flounder *Cleisthenes herzensteini* of Peter the Great Bay (Sea of Japan) have been studied. The features of distribution and accumulation of trace elements in organs and tissues of these aquatic organisms have been determinated. In the studied objects noted relatively high concentration of iron, copper and zinc in the gills and liver, a significant amount of arsenic found in muscle tissue of saffron cod. Toxic heavy metals chrome and cadmium in fish tissues are not found.

Keywords: pollock *Theragra chalcogramma*, saffron cod *Eleginus gracilis*, rudd *Tribolodon brandtii*, flounder *Cleisthenes herzensteini*, microelement, Sea of Japan.

A PROBLEM ON THE TROPHIC LEVELS CALCULATION OF AQUATIC ORGANISMS IN MARINE ECOSYSTEMS

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Different approaches for estimating of hydrobionts trophic levels, regarded as ones of basic parameters for ecosystem models «Ecopath» are presented. The uncertainty of such levels values in international computer databases, including Fishbase, Seaaroundus and Sealifebase, was performed by the analysis of initial treatment indices on original diet data for consumers and their prey in marine ecosystems. The necessity of the correction for values of trophic levels

in these databases are discussed.

Keywords: ecosystem models of «Ecopath» with «Ecosim», trophic level, compound indices, consumers and prey.

DYNAMICS OF FISH SPECIES COMPOSITION IN SHORE OF BLACK SEA IN SEVASTOPOL AREA

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The results of comparative analysis of species composition of Black Sea fish from Karantinnaya and Sevastopolskaya bays from 2008 to 2014 were presented. Positive changes in ichthyofauna during last 25 years were noticed according personal and literature data. The list of fish consisted from 49 species was presented by specimens which are living in bays all time or moving on spawing and feeding grounds. The high body pickarel, scorpion fish, red mullet and horse mackerel during many years in coastal area of Sevastopol are species dominated. Horse mackerel has become first mass species only in 2013–2014.

Keywords: Black Sea, fish, species composition.

IV INTERNATIONAL CONFERENCE «PROBLEMS OF PATHOLOGY , IMMUNOLOGY AND HEALTH PROTECTION OF FISH AND OTHER AQUATIC ORGANISMS »

(24–27.09.2015, BOROK, YAROSLAVL PROVINCE)

Given detailed information on the composition and number of participants, the subjects of the reports. The reports addressed the issues of evolutionary, ecological immunology, infectious and non-communicable diseases, the impact of the environment on mechanisms of adaptation, the new approaches of specific and nonspecific prevention and the use of immunological and biochemical parameters to assess the health of hydrobionts and aquatic ecosystems.

Keywords: hydrobionts, health, immunity, pathology, habitat.

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