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Principal environmental factors of the Volga River - North Caspian Sea basin ecosystem stability

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The index of the health and stability of any ecosystem is the prosperity existents of the upper trophic chain population. In the case of the Volga River - North Caspian Sea Basin this is a sturgeon *(Acipenseridae)* population. In this aspect the aim of the work is the revealing and evaluation of principal environmental factors that influence the distribution of sturgeon in the North part of the Caspian Sea. To serve this aim the data of 74 parameters, including physical-geographical, hydro chemical, hydro biological characteristics for each reference point (260 points) have been analyzed using pair correlation method. Then for substantiation of the influence environmental factors on the surviving of sturgeon we processed the received basic 14 independent variables, which characterize the integral state of ecosystem, by the factor analyses method of principal components, where “Ó” – density of sturgeon distribution in the sea. The analysis showed that all meaning variables could be separated according to loads into three common factors. **Factor 1** has the highest meaning of total dispersion in factor matrix – it defines 39.7% of variables. The highest load on the factor has variables: NO_2 and O_2 on the sea surface, average annual salinity in the water body, radiation balance, phytoplankton and zoobenthos biomasses. Taking into consideration the meaning of parameters included into this factor, we defined it as “Geoecological or Natural Conditions factor”. **Factor 2** has the second degree of meaning; it defines 15.5% of total dispersion. This factor evaluates the influence of temperature, depth (the wintering pits), ice distribution and quantity of zooplankton on the distribution of sturgeon during winter and defines the seasonal location of sturgeon in the sea as well as conditions of feeding base formation for the future feeding period, which enabled us to define it as “Wintering – post-wintering factor”. **Factor 3** inputs into total dispersion in the factor matrix - 12.7%. Maximum load of variables distance from the

Volga River delta main canal, average annual content of phenols in the water body, average annual distribution of the hydrocarbons in the water body on this factor indicate that it could be defined as “Factor of anthropogenic load”. This factor includes not only variables that characterize distribution of oil and phenols in the water body, but the variable that characterize the principal influence of the Volga River runoff in the North Caspian Sea pollution. So, main factors of the ecosystems stability in the North Caspian Sea are at first – geoecological, natural conditions, then - wintering conditions and in third anthropogenic loads. The priority of the “Geoecological factor” means that possible climate changes can lead to the serious disturbance of the North Caspian Sea ecosystems. The Wintering – post-wintering factor explains that the suitable oxygen regime during the winter period providing the ice-cover is famous for the health and stability of the Volga River - North Caspian Sea basin ecosystem stability.