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INDICATORS OF CHANGES IN POPULATION GROUPS OF MAMMALS IN THE INFLUENCE AREA OF THE ZEYA RESERVOIR UNDER THE IMPACT OF NATURAL AND ANTHROPOGENIC FACTORS

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Using the long-term data of the Zeya Nature Reserve, we accessed the natural and anthropogenic factors and their significance for the dynamics of the number of population groups of mammals in the influence area of the Zeya reservoir. Siberian musk deer (*Moschus moschiferus*), elk (*Cervus canadensis*), Siberian roe deer (*Capreolus pygargus*) and sable (*Martes zibellina*) were selected as model species. The anthropogenic part of population dynamics is defined on the basis of a comparative analysis of the long-term "test" (shore of the Zeya reservoir within the reserve territory), "control" (reserve territory outside the shores) and "background" (Amur Region) observations. We offer a step-by-step algorithm for studying mammals in the influence area of any large hydraulic structures. *The first step* is to restore the chronology of changes in the population density of the model species, then to determine the time needed for each species to partially adapt to the reservoir, which is as follows: musk deer – 30 years, elk – 25 years, roe deer – 28 years, sable – 20 years. *The second step* is to determine the leading natural factors of population dynamics. For musk deer, elk and roe deer the defining factor is precipitation in the early growing season of May and June, which determines the amount of winter food supply and the survival rate of young animals. For sable the factor is the dynamics of the total number of mouse-like rodents, which has a significant negative correlation with the cycles of solar activity and long-term trends of spring-summer precipitation. *The third step* is to determine the main factors of the influence that the reservoir causes on the population dynamics of the model species. For musk deer this is deteriorating conditions of protection, increasing mortality along the shoreline of an artificial reservoir due to various injuries, predators and epizootics. For elks this is the poaching activities and wolves that hunt them on the surface of the frozen reservoir. For roe deer this is the disrupted routes of seasonal migration, poaching and increasing hunting pressure from the predators. For sable it is the microclimatic influence of the reservoir that causes an increase in morbidity and depletion of the food supply due to decreasing numbers of mouse-like rodents. *The fourth step* is to identify common signs of the hydro construction impact on any mammals. Each model species found in the influence area of the Zeya reservoir experiences prolonged population depressions, low level of correlation between population dynamics and changes in the main limiting natural factors, reduced population density, and increased amplitude of population fluctuations. *The fifth step* is to quantify the impact the reservoir has on the model species. We used such index as the difference between the average (over the adaptation period) population density on the "control" plots and on the reservoir coast, in % of the "control" level. The average annual losses were 51.8% for Siberian musk deer, 51.2% for elk, 78.1% for Siberian roe deer, and 35.4% for sable. While being under protection, each of these model species was able to partially adapt to the Zeya reservoir over 20-30 years; their population dynamics generally recovered, but the density and migration activity remained significantly lower than it was before the construction of the reservoir.

Keywords: hydro construction, impact assessment, model species, Siberian musk deer, elk, Siberian roe deer, sable, mouse-like rodents, population dynamics, solar activity, precipitation.
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