

Modelling the range dynamics of the marsh frog (*Pelophylax ridibundus*) (Ranidae, Amphibia) in Russia under alternative scenarios of global climate change

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Abstract. Predictive maps of the distribution of the marsh frog (*Pelophylax ridibundus*) in Russia under the conditions of global climate change up to 2100 are presented. It is shown that under the influence of global climate change, the range will expand and the centroid will shift to the north-east. The patterns of the formation of the invasive part of the species range are summarized and maps are created for different models and scenarios of climate change, which include suitable territories for the further dispersal of the species in the European part of Russia, the Urals, Siberia and the Far East. It is shown that with warming in the case of low-sensitivity models, the area of territories suitable for the species will increase by 193(±76)%, and the shift of the center of the range in latitude will be 427(±82) km.

Keywords: marsh frog, Russia, global climate change

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REFERENCES

Duysebaeva T. N., Berezovikov N. N., Brushko Z. K., Kubykin R. A., Khromov V. A. Marsh frog (*Rana ridibunda* Pallas, 1771) in Kazakhstan: Range changing and recent distribution. *Current Studies in Herpetology*, 2005, vol. 3–4, pp. 29–59 (in Russian).

Zelenova L., Kunakov M. Animal world. In: *Rastitel'nyi i zhivotnyi mir Kaluzhskoi oblasti* [Plant and Animal World of the Kaluga Region]. Kaluga, Knigoizdat, 1962. 186 p. (in Russian).

Kuzmin S. L. *Amphibians of the Former USSR*. Moscow, KMK Scientific Press Ltd, 2012. 370 p. (in Russian).

Kuzmin S. L. The problem of global decline of amphibians. *The Problems of Herpetology. Proceedings of the 1th Meeting of the Nikolsky Herpetological Society*. Pushchino, Moscow, Moscow State University Publ., 2001, pp. 142–145 (in Russian).

Dgebuaдзе Yu.Yu., Petrosyan V. G., Khlyap L. A., eds. *The Most Dangerous Invasive Species in Russia (TOP-100)*. Moscow, KMK Scientific Press Ltd, 2018. 688 p. (in Russian).

Petrosyan V., Osipov F., Feniova I., Dergunova N., Warshavsky A., Khlyap L., Dzialowski A. The TOP-100 most dangerous invasive alien species in Northern Eurasia: Invasion trends and species distribution modeling. *NeoBiota*, 2023a, vol. 82, pp. 23–56. <https://doi.org/10.3897/neobiota.82.96282>

Petrosyan V., Dinets V., Osipov F., Dergunova N., Khlyap L. Range dynamics of striped field mouse (*Apodemus agrarius*) in Northern Eurasia under global climate change based on ensemble species distribution models. *Biology*, 2023b, vol. 12, iss. 7, article no. 1034. <https://doi.org/10.3390/biology12071034>

Petrosyan V., Kuzmin S. Amphibians of the Former USSR. Version 1.12. A. N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences. *Occurrence dataset*, 2022. (accessed via GBIF.org on 24 July 2023). <https://doi.org/10.15468/wxz3yj>

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