

Stock dynamics assessment of major baitfish species in the lower reaches of the Songhua River

Wanqiao LU¹, Peilun LI¹, Bo MA¹, Tangbin HUO¹, Zengqiang YIN², Fujiang TANG¹, and Jilong WANG¹

¹Heilongjiang River Fishery Research Institute of Chinese Academy of Fishery Sciences

²Dalian Ocean University

January 18, 2023

Abstract

The stability of the ecosystem directly affects water quality and safety, fishery production, and people's quality of life along the route. Therefore, a large amount of biological information on five dominant species of baitfish, including *Hemiculter leucisculus*, *Acheilognathus macropterus*, *Rhodeus sericeus*, *Pseudorasbora parva*, and *Squalidus argentatus*, was collected in the lower reaches of the Songhua River. The population parameters and variation rules of these fish were evaluated. The results showed that current exploitation of fish resources in the lower reaches of the Songhua River is excessive. The growth rate of baitfish is accelerating, but their growth potential is decreasing; the fish community structure is homogeneous, and the excessively small size of fish at a low age is obvious. In addition, the growth length coefficients of the five baitfish species were all greater than 0.2, which indicates fast growth; the growth performance indices were from 3.49 to 4.37. The exploitation rate of the *Hemiculter leucisculus* and *Squalidus argentatus* minnows was greater than 0.5, and the exploitation rates of all species except *Pseudorasbora parva* were higher than E_{max} . To ensure the size of the main baitfish populations in the lower reaches of the Songhua River, the mesh size of all nets should be controlled above 45 mm. In summary, these results provide a scientific basis for understanding the trend and growth of baitfish resources, identifying the distribution of major commercial or endangered fish feeding grounds in the region, and balancing ecosystem health integrity in the lower reaches of the Songhua River.

Hosted file

Manuscript `\begin{CJK}{UTF8}{gbsn} \end{CJK}\selectlanguage{english}20230115.docx` available at <https://authorea.com/users/576395/articles/619321-stock-dynamics-assessment-of-major-baitfish-species-in-the-lower-reaches-of-the-songhua-river>