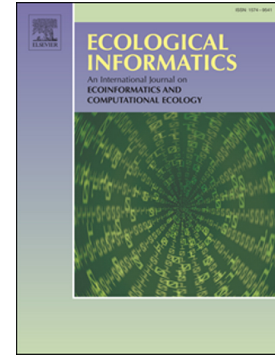


Accepted Manuscript

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PII: S1574-9541(17)30031-6
DOI: doi:[10.1016/j.ecoinf.2018.04.001](https://doi.org/10.1016/j.ecoinf.2018.04.001)
Reference: ECOINF 849
To appear in: *Ecological Informatics*
Received date: 1 February 2017
Revised date: 30 March 2018
Accepted date: 3 April 2018

Please cite this article as: Weiwei Yao, Tongtong Zhao, Yuansheng Chen, Guoan Yu, Mingzhong Xiao, Assessing the river habitat suitability and effects of introduction of exotic fish species based on aneco-hydraulic model system. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Ecoinf*(2017), doi:[10.1016/j.ecoinf.2018.04.001](https://doi.org/10.1016/j.ecoinf.2018.04.001)

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Assessing the River habitat suitability and effects of introduction of exotic fish species based on an ecohydraulic model system

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Abstract: An ecohydraulic model system was used to determine the levels of native fish species habitat suitability and assess the effects of two non-native fish species introduction in the Xiaonan River. The model system was developed by combining four models which are hydrodynamic, sediment transport, habitat and population models. The Light Belly fish (*Schizothorax lissolabius*) was selected as the native fish species. The Thorn Barb (*Barbodes caldwelli*) and Ray-finned fish (*Acrossocheilus yunnanensis*) were selected as non-native species. Water depth, flow velocity, substrates, and shear stress were used as suitability indicators for habitat and population models. A typical annual flow pattern was used to represent the discharge into the Xiaonan River. Numerical model simulations were created to determine native and non-native fish species' habitat suitability level and population density. The simulated results indicated that given atypical flow pattern, the habitat quality for native fish species was good and the population would remain stable. The research showed that the habitat level in Xiaonan River was very suitable for Ray-finned fish but not for Thorn Barb. It also suggested that the Ray-finned fish was a suitable fish species to import into Xiaonan River and its population could increase steadily after introduction. The analysis indicated that the model developed and used in this study could yield valuable information on river ecological processes and fish monitoring programs.

Key words: ecohydraulic model system; fish introduction; habitat suitability; population density

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