

Role of some environmental variables in trout abundance models using neural networks



Neural networks provide a "black box" model for explaining and predicting trout abundance with 8 environmental variables. This work investigates the specific effect of each variable, by inputting fictitious configurations of explanatory variables and by checking the responses of the model. The comparison between this response of the model to environmental variables on one hand, and results from field observations on the other hand, shows similarities and indicates neural network modelling can be trusted. The elevation appears to be the major explanatory factor. The influence of shelters, bottom velocity and Froude number also play an important role. When considered separately, depth does not have a notable influence on the density of trout. Such confirmations of field observations suggest that these models can be used to obtain a clear identification and hierarchization of the factors influencing the abundance of trout and the mode of action of the factors. This approach can be extended to other applications in quantitative ecology in which non-linear relationships are usually observed.

Auteurs du document : Sovan Lek, Alain Belaud, Philippe Baran, Ioannis Dimopoulos, Marc Delacoste

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