

Modelling habitat requirements of white-clawed crayfish (



The white-clawed crayfish's habitat has been profoundly modified in Piedmont (NW Italy) due to environmental changes caused by human impact. Consequently, native populations have decreased markedly. In this research project, support vector machines were tested as possible tools for evaluating the ecological factors that determine the presence of white-clawed crayfish. A system of 175 sites was investigated, 98 of which recorded the presence of *Austropotamobius pallipes*. At each site 27 physical-chemical, environmental and climatic variables were measured according to their importance to *A. pallipes*. Various feature selection methods were employed. These yielded three subsets of variables that helped build three different types of models: (1) models with no variable selection; (2) models built by applying Goldberg's genetic algorithm after variable selection; (3) models built by using a combination of four supervised-filter evaluators after variable selection. These different model types helped us realise how important it was to select the right features if we wanted to build support vector machines that perform as well as possible. In addition, support vector machines have a high potential for predicting indigenous crayfish occurrence, according to our findings. Therefore, they

are valuable tools for freshwater management, tools that may prove to be much more promising than traditional and other machine-learning techniques.

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