

# Possible changes of the brown trout habitat suitability in the upper Po basin due to global change

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Brown trout (salmonid fish) is a European species of salmonid fish that has been extensively imported from suitable places around the world. It involves the rise of pure water, called the river ecotype. Brown trout is widely imported from suitable places around the world, including North and South America, Australia, Asia, and South East Africa. Climate change is one of the most important global processes in the Biosphere, and fish as part of Biology do not care about this process. Coldwater fish and, especially the Brown trout (salmonid fish), are more sensitive to predictable changes in temperature levels and streams. The introduction of brown trout has established a livelihood, wildlife in many imported countries. Water temperature is a major problem in the ecological study of white water because it affects physical, chemical and facial processes and, therefore, the organisms that live at all or part of this in water. Therefore, climate change can preclude the availability of suitable habitat for many species of fish including trout brown. Weather simulations predict an increase in temperature and extreme events. These changes are expected to lead to a logical change in the hydrological cycle which has a significant impact on the ecological integrity of the aquatic environment. Brown trout will be very close to their body function limits and thus jeopardize the production of somatic and reproductive biomass. Some ability to adapt to high temperatures is possible but overheating of the body may be unavoidable. Genetic diversity and apparent variability in plasticity may compensate for the effects of

climate change, but rapid changes may interfere with adaptability because cohesion is not limited to changes in temperature and signals of intrusion / sub-aquaculture will affect ecosystems. Within this context it appears to be a strategy to predict the effects of global change in aquatic biodiversity and the distribution of species in order to identify adequate measures aimed at mitigating the impact of climate change on ecosystems. For this purpose we have made a simulation based on a series of speculation models to predict the distribution of the brown trout in the highlands of the Phe River basin (North Italy). The 140-year hypothesis, based on the Local Climate model, is used to force the hydrological model to cycle the hydrological cycle. The results of hydrological simulations, particularly variations in temperature and humidity, are then used to confirm areas where target species are expected to occur. The results show how this proposed complex approach is able to reproduce, with good confidence, the current distribution of brown trout. The speculation of the coming years indicates a shift in distribution to the upper parts of the basin, with a reasonable reduction in areas where trout brown can survive, produce and grow. This work also focuses on the potential use of the proposed method of assessing the effects of climate change on complex environmental systems