

WILL CLIMATE CHANGE INFLUENCE FISH POPULATION DYNAMICS IN TEMPERATE RIVERS?

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Running header: Influence of climate on cyprinid fish populations

ABSTRACT

The influence of key climate-driven environmental parameters on the population dynamics of three cyprinid fish species; chub (*Leuciscus cephalus* (L.)), dace (*Leuciscus leuciscus* (L.)) and roach (*Rutilus rutilus* (L.)) were modelled. Monthly variability in temperature (cumulative degree days and cumulative degree days increment), flow (cumulative discharge days and Q values) and climate (NWGS) over a 15-year period were investigated to determine their effect on length at age 1, Annual Growth Increment (AGI) and Year Class Strength (YCS). In order to produce a robust and statistically valid model, data sets from four English rivers (Avon, Lee, Great Ouse and Don) were combined. All models were statistically significant and adjusted r^2 values ranged between 0.161 and 0.752. Monthly values for NWGS and cumulative degree day increments had the greatest influence on

population dynamics, highlighting the vulnerability of UK cyprinid fish populations to a changing climate, especially increase or decrease in temperature.

Key words: climate; growth; model; temperature; discharge.