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Macroparasites in Managed Systems: Using mathematical models to help reduce the Impact of *Argulus foliaceus* in UK Fisheries

Argulus foliaceus is a macroparasite which reduces the aesthetic appeal and catchability of rainbow (Oncorhynchus mykiss) and brown (Salmo trutta) trout in still-water fisheries across the UK; infection is detrimental to fish welfare, can lead to loss of revenue, and impacts negatively on the reputation of the affected fisheries. Current methods of control can be both extreme and ineffective, with the parasite often surviving in surprising circumstances, despite constant, expensive treatment.

The aim of this talk is to present mathematical models, in the form of coupled non-linear ODEs, which describe the relationship between argulids and their hosts, incorporating reduced catch rates and several different stocking methods. Fishery managers can stock fish into their lakes in a number of different ways in order to make sure that anglers catch enough fish and want to return to their fishery. This talk will investigate the relationship between those stocking methods, the response of the fish to parasitism and the number of parasites in the lake. These combine to have a - sometimes counterintuitive - knock-on effect on the number of fish caught and hence the economic viability of the fishery.