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*Biological control through intraguild predation: what is the most efficient control method?*

Rusty crayfish (*Orconectes rusticus*) are aggressive invaders of the Great Lakes ecosystem. They interact with indigenous smallmouth bass (*Micropterus dolomieu*) through intraguild predation. Mature bass are predators of rusty crayfish, but predation is gape-limited, with the largest crayfish escaping predation. These individuals are the most fecund and compete with juvenile bass, causing a “juvenile competitive bottleneck”. We use a stage-structured model to explore the dynamics of the interacting species and the possible biological control of rusty crayfish by smallmouth bass. The modelling framework can also be used to evaluate the most efficient method of mechanical control of crayfish using either trapping or trawling or a combination of both.

Smallmouth bass is a sport fish in many of the invaded lakes, and lakes with smallmouth bass have high recreational value. The impact of different fishing regulations on crayfish control can also be assessed. We use the framework to suggest methods for socially and cost-effective control.