January 15, 2021

Dear Special Issue Editors Dr. Seekell, Dr. Heffernan, Dr. Holbrook and Dr. Pace,

We are pleased to submit our manuscript, **“**Managing recreational fisheries from a multi-species perspective: Leveraging species interactions and accounting for positive feedback loops to maintain desired ecosystem states” for consideration in the *Limnology and Oceanography* special issue on nonlinear dynamics, resilience, and regime shifts in aquatic communities and ecosystems. In this manuscript, we explore the role that ecological interactions play in maintaining or disrupting stable states in inland recreational fisheries. We developed a theoretical model in order to explore the ability of commonly used management interventions to maintain a system in a ‘desired’ stable state. This study is the first of its kind to explore the mechanistic levers decisions makers can use to maintain stable regimes in systems that do not respond to linearly to management action.

Freshwater fishery systems do do not always respond in linear, predictable ways to management action. One reason for this non-linearity is not accounting for interspecific interactions in active management. Here, we develop a theoretical model of a recreational fishery in which the initially dominant focal species can be influenced by another harvested species in the system. This fishery model exhibits alternative stable states, driven primarily through cultivation-depensation mechanisms. We then use this fishery model to explore the impacts of management interventions in an effort to demonstrate how decision makers can leverage these species interactions in order to maintain the stable state of a system. Our work demonstrates the necessity of managing fisheries with an ecosystem-based framework in light of ecological and social interactions that may result in unexpected outcomes.

All authors have approved the submitted manuscript and agreed to be listed as such.

We have no conflict of interest to declare. This manuscript has not been published or submitted elsewhere.

Thank you for considering our manuscript for publication in the *Limnology and Oceanography* special issue on nonlinear dynamics, resilience, and regime shifts in aquatic communities and ecosystems*.* We look forward to hearing from you soon.

Sincerely,

Colin Dassow, on behalf of all authors

University of Notre Dame, Department of Biological Sciences