“Species differences, but not habitat, influence catch rate hyperstability across a recreational fishery landscape”

Camille L. Mosley[a], Colin J. Dassow[b] , John Caffarelli[a] , Alexander J. Ross[c] , Greg G. Sass[d], Stephanie L. Shaw[d], Christopher T. Solomon[e] , Stuart E. Jones[a]

[a] Department of Biological Sciences, University of Notre Dame, Notre Dame, IN 46556, USA
[b]Office of Applied Science, Wisconsin Department of Natural Resources, Spooner, WI 54801, USA
[c]Faculty of Natural Resources Management, Lakehead University, Thunder Bay, ON, Canada
[d]Office of Applied Science, Wisconsin Department of Natural Resources, Escanaba Lake Research Station, Boulder Junction, WI 54512, USA
[e]Cary Institute of Ecosystem Studies, Millbrook, NY, USA

In fisheries, catch rate is often assumed to be proportional to stock size and is used by managers and fishers as an indicator of fishery sustainability. If catch rate is proportional to stock size, it can signal a decline of stocks and managers can impose restrictive harvest policies or recreational anglers can move to a new system and allow the system to rebound. A growing literature has documented catch rates remaining high even as fish stocks decline (i.e., hyperstability of catch rates). Although recent evidence has indicated the presence of hyperstability of catch rates in recreational fisheries, whether hyperstability differs across species or system types remains unknown. To investigate whether catch rate hyperstability varies amongst species or systems, we compared the relationship between angler catch rate and fish abundance for common freshwater sport fishes across gradients of habitat availability. We found significant differences in the strength of hyperstability amongst species. We did not identify a consistent influence of habitat on hyperstability of catch rates. Angler preferences and behavior may explain some of the variance in non-proportional catch rates. Future research investigating angler behavior, population size structure, and population dynamics in these systems may identify key interactions that create differences in vulnerability to population collapse.