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Dublin Road
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October 11, 2019

Prof. Brian D. Fath
Department of Biological Sciences
Towson University
8000 York Road
Towson
Maryland 21252
USA

Dear Professor Fath,

We would like to submit an *Original research* paper titled *'Highly resolved spatiotemporal simulations for exploring mixed fisheries dynamics'* for consideration in *Ecological modelling*. In this paper we develop and apply a simulation model of a ecological-fishery system where individual fishing vessels exploit multiple heterogeneously distributed fish stocks with full spatiotemporal population dynamics. In it we explore the importance of spatial and temporal scale when modelling fishery interactions, particularly in relation to modelling observational data from a system with preferential sampling.

Our study tackles the issue of how fishers exploit a dynamic natural resource with uncertain knowledge of its distribution. We detail how this affects our understanding of the fisheries interactions with multiple fish populations, which cannot be achieved with a conventional modelling approach. By capturing dynamics observed in fisheries data in a novel simulation model where the entire dynamics of the system (including the true spatial distribution of the populations) are known, we expose that degrading the spatial and temporal resolution of data through aggregation reduces our ability to define effective spatial management measures. This would not of been possible without the highly details and resolved simulation approach used here. The model has many potential additional applications which we discuss, with the model made available as an R software package for users to explore.

Should you consider our work suitable for review, we would like to suggest the following associate editor and potential reviewers with a rationale below each:

- **Associate Editor** Prof. Terrance Quinn II, College of Fisheries and Oceans, University of Fairbanks, Alaska (tjquinnii@alaska.edu).

- **Reviewer** Dr David Peel, Commonwealth Scientific and Industrial Research Organ-

isation (CSIRO), Castray Esplanade, Hobart TAS 7000, Australia (david.peel@csiro.au). Established expert in finite mixture modelling.

- **Reviewer** Dr John Morrengiello, University of Melbourne, Melbourne, Australia (john.morrongiello@unimelb.edu.au)
  Early career scientist with expertise in quantitative aquatic ecology and evolution along with publications on growth modelling.
- **Reviewer** Dr Ken Newman, U.S. Fish and Wildlife Service, Lodi Fish and Wildlife Office, 850 Guild Avenue, Lodi, CA 95240, USA (Ken_Newman@fws.gov)
  Established expert in mathematical and applied statistics with application to natural resource management.

Thank you for your time and consideration.

Yours Sincerely,

Paul Dolder
Dr Cóilín Minto
Prof Jean-Marc Guarini
Dr Jan Jaap Poos