…th 2021

To: The Editors of Fish & Fisheries,

Please consider our historical meta-analysis, titled ‘Global and historical meta-analysis of albacore tuna diet patterns and prey guilds synthesised using species traits’, for publication as **an article** in Fish and Fisheries.

Scientists face significant challenges in modelling and projecting for already dynamic, and now rapidly changing distributions and productivity of highly migratory and commercially valuable fisheries species under climate change. Even less is known of the relationships between tuna distributions and productivity, and that of the resources they consume and grow from, despite the rapid rates of change these systems are experiencing.

We reconstructed the historical and cross-basin resource use of albacore tunas (*Thunnus alalunga*) from recent publications to historical reports from the early 20th century. We present, to-date, the most extensive taxonomic list of prey consumed by albacore tunas and relate those prey functional traits that influence predator-prey encounter and capture. In doing so, we achieve both (1) a salient and reusable synthesis of resource diversity down to 7 key functional prey guilds, and (2) a framework to further resource use modelling and projection in this predator, and to other highly migratory pelagic predators globally.

We built multivariate and multi-matrix trait-based models to assess both the taxonomic and trait-based variance in albacore diets across ocean basins and life stage of the predator. Using either the individual trait values or functional prey guilds, we captured broad trait-based patterns in the diets of these dynamic predators and revealed significant geographic signatures in albacore diets with greater explanatory power than multivariate models fitted to species taxonomic identities or phylogeny alone.

In addition to providing this biogeographic contingency to current food web modelling efforts, we propose the use of reproducible prey guilds and trait-based predictors for modelling predator-prey interactions in wide-ranging and highly migratory pelagic species, in the context of changing environmental and ecological states. Finally, digitised historical data on albacore diets, relational trait datasets and analytical workflows are available and transferable for future analysts.

We present original work carried out by the authors and acknowledge the requirements for publication in this prestigious journal. We appreciate your time and attention in considering this manuscript.

Sincerely,

On behalf of all co-authors,

Natasha Hardy