Dear Prof. Bolnickand members of the *American Naturalist* editorial board,

Please find enclosed our manuscript “**Size-dependent migration tradeoffs in seasonal environments.**”

Drivers affecting mobility and migration patterns have long been the subject of intense study in ecology and evolution. Yet, there are still many open questions about the mechanisms driving intraspecific variation in animal movement and migration and its consequences for metapopulation dynamics. Movement across habitats and migration are usually dependent on individual’s condition but few studies have attempted to connect the empirical patterns of intraspecific migration variation with models accounting for seasonality, predation and temperature dependent growth to decipher the empirical patterns across many sampling sites.

In the present study, we extend previous models exploring the condition to move between habitats accounting for a tradeoff between predation and temperature-dependent growth. We show how this tradeoff predicts patterns of migration that mirror empirically three years of observed migration data. Our results show strong support for the importance of condition-dependent tradeoffs, with larger individuals migrating significantly earlier from natal to migratory habitat. As this difference holds true within single and across all populations sampled, we suggest the mechanism behind this pattern is not density-dependent but rather only due to larger differential growth and lower specific predation pressure for larger individuals. Such tradeoffs should be more widely studied to increase our understanding of synchrony and temporal population dynamics in spatially structured landscapes.

We hope you consider our manuscript for publication in the *American Naturalist*. All the authors confirm that our results are outstandingly novel relative to current condition-dependent migration dynamics theory and to recent work by all the authors. The authors have no conflicts of interest to disclose. This work has not been published elsewhere, nor is it currently under consideration elsewhere.

On behalf of the authors,

Philip Dermond

Carlos J Melián

Jakob Brodersen