The migration game in habitat network: the case of tuna - DTU Orbit (08/11/2017)

The migration game in habitat network: the case of tuna

Long-distance migration is a widespread process evolved independently in several animal groups in terrestrial and marine ecosystems. Many factors contribute to the migration process and of primary importance are
intra-specific competition and seasonality in the resource distribution. Adaptive migration in direction of increasing fitness should lead to the ideal free distribution (IFD) which is the evolutionary stable strategy of the habitat selection game. We introduce a migration game which focuses on migrating dynamics leading to the IFD for age-structured populations and in time varying habitats, where dispersal is costly. The model predicts migration dynamics between these habitats and the corresponding population distribution.
When applied to Atlantic bluefin tunas, it predicts their biomass is located in the spawning areas which have also the largest diversity in the age-structure. Distant feeding areas are occupied on a seasonal base and often by larger individuals,
in agreement with empirical observations. Moreover, we show that only a selected number of migratory routes emerge as those effectively used by tunas

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