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# Role of social interactions on dynamics of fish aggregations in a multi-site system of fish aggregating devices (FADs)

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## Abstract

Metapopulation models describe the colonization and extinction of populations in interconnected patches. In this general context, habitat selection is a complex decision making process that involved both responses to environment cues and congeners. In this study, we investigate how social behaviour affects distribution of population in multi patch environment. More precisely, based on the case study of temporal aggregation of tuna with surface heterogeneity such as Fish Aggregating Devices (FADs), we further examine the influence of increasing number of patches. Using both system of differential equations and stochastic simulations we demonstrate how social interaction in both settlement and departure processes significantly affect the dynamic and the distribution of population between patches. These results could have major implication in term of fisheries management that currently needs to propose measures to mitigate the effect of FADs deployment by tuna fishing industry.

**Keywords:** tuna, FAD, fragmentation, behavior, aggregation, population dynamic

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