Connectivity Through Ontogeny: Fish Population Linkages Among Mangrove and Coral Reef Habitats

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ABSTRACT

Most evidence for ontogenetic migration of fishes from mangroves to coral reefs has been based on cross-sectional studies of < 2-yrs duration that have not considered annual variability in recruitment. Taking a longitudinal approach, we evaluated evidence for mangrove-derived replenishment of ten coral reef fishes by drawing on data from two concurrent fish monitoring efforts conducted in Biscayne National Park, Florida, USA, over the period 1999–2007. Annual indices of abundance were calculated for fish estimated to be age 0^+ to 4^+ years in both habitats, and correlation analyses, with appropriate temporal lags, were performed. Statistically significant ($p < 0.05$; $r^2 = 0.30$ to 0.71) correlations between juvenile abundances in mangrove habitats and adult abundances on the reef tract one to two years later emerged for four species: *Abudefduf saxatilis*, *Lutjanus apodus*, *L. griseus,* and *Sphyraena barracuda.* This is one of the few longitudinal studies that uses juvenile abundance indices to test mangrove–reef ontogenetic connectivity. Our results have potential utility for nursery habitat assessment, marine reserve design, and for forecasting species-specific year-class strength on the reef, where most fishing is directed.

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