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**Ecological bridges and barriers in pelagic ecosystems**

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**Abstract**

Many highly mobile species are known to use persistent pathways or corridors to move between habitat patches in which conditions are favorable for particular activities, such as breeding or foraging. In the marine realm, environmental variability can lead to the development of temporary periods of anomalous oceanographic conditions that can connect individuals to areas of habitat outside a population's usual range, or alternatively, restrict individuals from areas usually within their range, thus acting as *ecological bridges* or *ecological barriers*. These temporary features can result in novel or irregular trophic interactions and changes in population spatial dynamics, and, therefore, may have significant implications for management of marine ecosystems. Here, we provide evidence of ecological bridges and barriers in different ocean regions, drawing upon five case studies in which particular oceanographic conditions have facilitated or restricted the movements of individuals from highly migratory species. We discuss the potential population-level significance of ecological bridges and barriers, with respect to the life history characteristics of different species, and inter- and intra-population variability in habitat use. Finally, we summarize the persistence of bridge dynamics with time, our ability to monitor bridges and barriers in a changing climate, and implications for forecasting future climate-mediated ecosystem change.

**Keywords:** species distribution, migration corridors, population connectivity, oceanographic features, tuna, billfish, marine mammal, Brazilian episode

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