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CORRESPONDENCE

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The spatial context of "winning" in MPA network design: Location matters

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Chollett et al: *A Genuine Win-Win: Resolving the "Conserve or Catch" Conflict in Marine Reserve Network Design*, Conservation Letters, September/October 2017, 10(5), 555–563.

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Chollett et al. (2017) make the case that a local network of marine protected areas (MPAs) enhances fisheries for Caribbean spiny lobster (*Panulirus argus*) off the coast of Honduras. However, their simulation focused on one ecoregion where self-recruitment is predicted to be among the highest in the Caribbean (Cowen, Paris, & Srinivasan, 2006). The shallow banks and scattered cays of the Honduran-Nicaraguan Rise, separating the Cayman and Colombian basins, create an obstacle to the powerful southern Caribbean jet (Richardson, 2005), fostering an ideal location for topographically steered eddies and larval retention. Local management, whether based on traditional techniques or MPAs, is indeed likely to be successful in sustaining the lobster population in that region. But the authors go too far in promoting local management based on a best-case scenario where the population is largely self-recruiting, and they downplay the need for international cooperation in managing one of the most economically important species in the Caribbean (Kough, Paris, & Butler IV, 2013).

Caribbean spiny lobsters are widely distributed throughout the west-central Atlantic from Brazil to Bermuda, a remarkable distribution promoted by their lengthy pelagic larval duration. Truelove *et al.* (2017) recently found a perceptible but weak genetic structure among *P. argus* populations in the Caribbean and those genomic patterns correlated well with biophysical modeling results (Kough *et al.*, 2013). The picture formed by those and numerous other studies is that recruitment of *P. argus* is best described as a metapopulation dominated by widespread larval connectivity punctuated by a few regions where larval transport interacts with local habitat structure to enhance self-recruitment.

We revisited the larval transport of Chollett *et al.* with a similar simulation, including increased temporal resolution, to estimate *P. argus* larval exchange within their Caribbean-wide habitat bounds (Supporting Information). In only three ecoregions, The Bahamas, Belize, and the Windward Lesser Antilles, is self-recruitment predicted to exceed 50%. The Honduran-Nicaraguan Rise also has high self-recruitment (39%), yet, unlike the rest of the Caribbean besides the Windward Lesser Antilles, receives larvae from relatively few outside sources. This is an unusual best-case stock-recruitment scenario. We fear that readers, particularly those tasked with managing *P. argus* fisheries, will glean from Chollett *et al.* the mistaken notion that local management of adult stocks are likely to successfully sustain levels of larval recruitment. International connectivity trumps local sources in larval exchange in most of the Caribbean.

Management requires consideration of a species' biology as well as the ecological and spatial context within which that biology plays out. Effective local management of fishery stocks and nursery habitats is crucial for sustaining and

rebuilding over-fished populations. Importantly, Chollett *et al*. provide an excellent pathway forward for a sustainable fishery reserve network in Honduras. But in only a few regions are such actions sufficient to sustain the local recruitment of the widely dispersing *P. argus*, a species whose metapopulation dynamics demand greater cooperation among management units: location matters.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

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