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# Benthic Dispersal of Caribbean Spiny Lobsters among Insular Habitats: Implications for the Conservation of Exploited Marine Species

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**Abstract:** *Understanding how populations of target species interact with their habitats is necessary for developing an effective conservation strategy. During its complex life history, the Caribbean spiny lobster (*Panulirus argus*) uses a variety of benthic marine habitats, but how habitat characteristics affect their dispersal is unclear. To assess how habitat insularity affects the benthic dispersal of spiny lobsters, I compared lobster abundance, size class structure, and migration among insular mangrove and coral reef habitats that were surrounded by bare rubble fields or by seagrass meadows. Lobsters were significantly more abundant on mangrove and coral islands surrounded by seagrass. The size-class distributions of lobsters in these habitats had higher proportions of juveniles, whereas islands surrounded by sand and rubble had skewed distributions dominated by adult lobsters. Seagrass is known to serve as settlement habitat for larval recruits and is likely associated with the higher abundances of lobsters found in seagrass-isolated habitats. Immigration and emigration rates were three to four times higher on seagrass-isolated islands than on rubble-isolated islands, reflected in the significantly greater number of juveniles moving into and from seagrass-isolated islands. Rubble fields appeared to function as a barrier to benthic dispersal for all lobsters except adults. Vegetated substrates may function as movement corridors for juvenile lobsters and may facilitate dispersal to areas containing new resources. The effects of insularity on a population may be lessened by the nature of the surrounding habitats if those habitats have important functional roles as larval settlement areas, foraging grounds, or movement corridors. Protection of insular habitats like coral reefs may be ineffective if related habitats like seagrass meadows are left unprotected. Conservation strategies for mobile benthic species need to incorporate the protection of areas with heterogeneous habitats that are important to meet the changing habitat requirements in complex life cycles.*

Dispersión Béntica de la Langosta Espinosa del Caribe entre Hábitats Insulares: Implicaciones para la Conservación de Especies Marinas Explotadas

**Resumen:** *El entendimiento de cómo las poblaciones de especies clave interactúan con sus hábitats es necesario para desarrollar una estrategia efectiva de conservación. Durante su compleja historia de vida, la langosta espinosa del Caribe (*Panulirus argus*) usa una gran variedad de hábitats bénticos marinos, pero es poco claro el cómo las características del hábitat afectan su dispersión. Para evaluar cómo el aislamiento del hábitat afecta la dispersión de las langostas comparé la abundancia, la estructura de clases de tallas y la migración entre manglares insulares y arrecifes de coral que estaban rodeados de campos de escombros desnudos o por vegas de pastos marinos. Las langostas fueron significativamente más abundantes en manglares e islas coralinas rodeadas por pastos marinos. Las distribuciones de clases de talla de las langostas en estos hábitats tuvieron una mayor proporción de juveniles, mientras que las islas rodeadas de arena y escombros tuvieron distribuciones sesgadas dominadas por adultos. Los pastos marinos son conocidos por servir como*

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