The potential for long-range dispersal of Caribbean spiny lobster (Panulirus argus) increases the difficulty in determining origins of local populations, thus impairing management. Spiny lobster supports the primary fishery in The Bahamas, where the use of condos/casitas as a fishing method has increased. Yet, the combination of the ecological, social, and management implications of condo usage have not been fully evaluated. Here, I present an interdisciplinary approach and assess how this strategy can assist with the difficulties of designing sustainable fisheries management. Emphasis is placed on the integration of anthropological and biophysical modeling techniques, providing an example of how these merged tools can support management decisions. Simulations of larval dispersal for Bahamian spiny lobster populations indicate dispersal distances of 200-400 km, with a 25% probability of survival. Surveys and semi-structured interviews of Bahamian fishers revealed five popular areas for condo placement. Further connectivity assessments of these locations indicate higher rates of settlement for 4 sites. Two of these demonstrated a narrower dispersal, suggesting self-recruitment. However, the remaining locations depend on subsidies from other Caribbean populations. These differences suggest each location be evaluated individually to determine spatially-dependent management actions, and to effectively develop and implement condo-related policies supported by local communities.