Defining a protocol for recreational scuba diving Carrying Capacity within a marine protected area (MPA)

Definiendo un protocolo para la Capacidad de Carga del buceo recreativo dentro de un área marina protegida (MPA)

Définir un protocole pour la capacité d'accueil de la plongée sous-marine récréative au sein d'une aire marine protégée (AMP)

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EXTENDED ABSTRACT

Honduras has over 91 protected areas, however only 28 of them are legally declared coastal and marine protected areas. Roatan is one of the 3 protected islands within the Bay Islands National Park (PNMIB). Roatan, located in the Mesoamerican reef (MAR) region, has its economy depending on tourism having over 1 million tourists each year. A big part of this tourism is motivated by scuba diving related activities, including scuba diving and snorkelling (Carrasco et al., 2013). With purpose of helping local and international decision makers in Roatan, 10 dive sites representative of the majority of dive sites of the island were assessed for their Carrying Capacity (CC) during the months of March and April from 2021. The Tourism Carrying Capacity (CC) is defined as the bio-physic and social capacity of tourist an environment, usually marine protected area, can sustain without being degraded. Within dive sites in protected areas (MPAs), this is usually defined as the maximum number of divers per year that can visit a dive site without deteriorating or damaging the coral reef (Amador et al., 1996; Gallo et al., 2002; Augustowski et al., 2005; Melo et al., 2006.). Scuba divers' impact on the reef was recorded by following each diver for 10 minutes and registering every contact with the reef, defining 3 types of contacts: no damage, tissue abrasion and breakage. For the calculation of the CC, different factors were considered (climatic conditions, social factor, damage factor and fragility cover factor) . In addition, we evaluated the role of different factors related to recreational scuba diving that could place coral reefs in risk and were observed during the sampling (level of certification/experience and the use of a lionfish spear) (Gallo et al., 2002; Augustowski et al., 2005; Melo et al., 2006; Rios-Jara et al., 2013 and Soria Diaz & Soria Solano, 2015). The results showed a different CC for each dive site: Half Moon Bay (5065 diver/year), Moonlight (7842 divers/year), Lighthouse (6779 divers/year), Blue Channel (18037 divers/year), Canyon Reef (8077 divers/year), Deep Sea Quest (18350 divers/year), Butchers Bank (17266 divers/year), Mandy`s Eel Garden (7087 divers/Year), West end Wall (14072 divers/year) and Texas (14350 divers/ year). Considering the certification level from the divers, a statistically significant difference was observed between the lowest certification level (Open Water Diver) and higher certification levels (Advanced Open Water Diver & Divemaster). In the case of the relationship between using a lionfish spear or not, there was a statistically significant difference showing a higher frequency of contacts when using the spear. However, it was concluded that for both factors a better training and stronger environmental education could reduce the impacts on the reef, but also further studies should be done on these topics. Finally, it was concluded that the CC calculations should be considered as a starting point for future monitoring and management measures for Bay Islands National Park Reef.

KEYWORDS: scuba diving, carrying capacity, marine protected areas, coral reef

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