

Rapid assessment of coastal underwater spots for their use as recreational scuba diving sites



A. Flores-de la Hoya, E. Godínez-Domínguez*, G. González-Sansón

Departamento para el Desarrollo Sustentable de Zonas Costeras, Centro Universitario de la Costa Sur, Universidad de Guadalajara, Avenida Gómez Farías No.82, San Patricio-Melaque, CP 48980, Jalisco, Mexico

ARTICLE INFO

Keywords:

Scuba diving
Rapid assessment
Multidisciplinary approach
Coastal management
Central Pacific coast

ABSTRACT

Coastal zone management requires consideration of not only conservation efforts, but also the sustainable use of their natural resources for human purposes. Therefore, there is a growing consensus on the importance of designing new multidisciplinary, economically affordable, and effective approaches to address these needs. In this study, a rapid assessment methodology is proposed to generate habitat characterization that works as a baseline for management. Several rocky-shallow sites located in Bahía de Navidad were assessed from the point of view of “landscape quality” for the practice of recreational scuba diving, to provide an overview of the state of physical, biological and environmental features and to evaluate their potential for tourism use. More than 30 sites were sampled over a year, grouped in 7 zones, covering three periods: an aftermath period of a circumstantial category 2 hurricane (November and December 2011), a dry season (February–June 2012), and a rainy season (July–December 2012). The sites were described using 40 variables considered appealing for the practice of recreational scuba diving, sub classified in four criteria: abiotic factors, anthropogenic impact, biotic factors, and accessibility. An expert criterion was used as a weighting factor to enhance the most significant variables defining the quality of a dive experience, then the data were analyzed from a zonal classification approach, followed by a non-metric MDS analysis conducted to corroborate the emerged patterns and a PERMANOVA analysis to identify significant differences between zones and seasons. As a result, an integrated zoning pattern oriented for management was determined, where the zones are hierarchically identified accord to their quality scores for the recreational scuba diving practice, and their required skill level is recommended as well. The results also showed evidence of a high ecosystem resilience and low disturbance after the hurricane passed, factors that actually improved the quality of diving experience in this particular case. In addition, the fact that the rainy season showed more favorable features than the dry season (better visibility, warmer sea water and more fauna) was also observed. Finally, the features observed and their relevance for the definition of the quality of the diving experience of the sites and their zones are discussed.

1. Introduction

The average income of the scuba diving tourists is higher than the average income of the regular tourists (Garrod and Gössling, 2008). Three quarters of the scuba diving tourism world market is comprised of people living in the United States, choosing places that offer coral reefs to explore, as their favorite destinations. This means that scuba diving tourism has a strong international character because the greater number of people practicing it, live in the northern hemisphere, having to travel to tropical destinations on a regular basis (Santander-Botello and Frejomil, 2009).

Nevertheless, as the number of scuba divers and snorkelers is increasing and these activities are concentrating in popular areas, concern

about localized deterioration of sites has increased as well (Plathong et al., 2000). Managers have become increasingly aware that successful protection of marine ecosystems is dependent not only upon an understanding of their biological and physical processes, but also their associated social and economic aspects, unfortunately, economic values are rarely considered in decision-making and policy development (Thur, 2010). Therefore, sustainable tourism becomes critically important because it can provide a source of financing for conservation of natural areas, serve as an economic justification for protection of natural resources, offer a sustainable economic alternative to local people against depletion or destruction of natural resources, and promote conservation and build support with economic constituencies (Hawkins, 1998). The key to environmental management is to allow

* Corresponding author.

E-mail address: egodinez@gmail.com (E. Godínez-Domínguez).

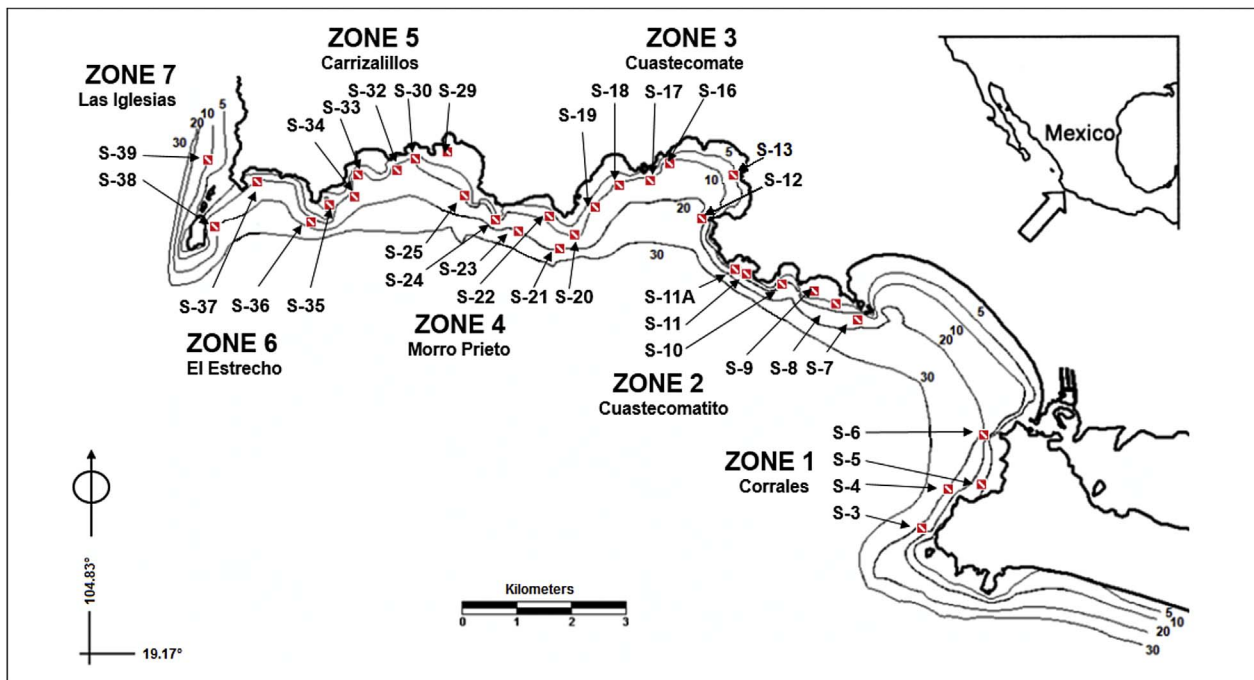


Fig. 1. Study area, zones and assessed diving sites.

people to visit and appreciate natural areas without destroying them or changing them in such a way that the experience is degraded or trivialized (Kenchington, 1993). Scuba diving and snorkeling, properly practiced, represent an interesting alternative for economic development, which combines income generation for the local community with the non-consumptive use of marine biodiversity (Cruz and Calle, 2011). Both activities are amongst the major commercial uses of Marine Protected Areas (MPAs) around the world, and the control of their potential impacts on the marine environment remains a key factor for the management of these recreational activities (Di Franco et al., 2009; Rangel et al., 2015).

The use of coastal areas for human pleasure has always been a concern for scientific and management communities, leading to conflict between the choice of recreational uses or natural preservation (Rangel et al., 2007). The growing demand for recreational diving activities, and the consequent increased specialization of users, will likely lead to requests for different options, as opposed to basic recreational activities (Cater, 2008). These requests can be answered by more detailed knowledge of the underwater environment, represented by biotic and abiotic elements intertwined together. Underwater geoheritage valorization and conservation are therefore needed to induce a shift from an unaware and merely recreational use of the sea to one rooted in the knowledge of the marine natural heritage (Rovere et al., 2010). Geoheritage can be understood as those components of natural geodiversity of significant value to humans, including scientific research, education, aesthetic and inspiration, cultural development, and sense of place experienced by communities (Dixon, 1996).

If a site, characterized by rich biological and cultural values, becomes popular and is not properly managed, it is more likely to become degraded due to heavy visitation, decreasing the quality of the recreational experience (Hillery et al., 2001; Petrosillo et al., 2007). In this context, new management trends have emerged progressively as a form of expression of the new area management paradigm that emphasizes efforts to capture a broad spectrum of opinion as a basis for setting wise management interventions that satisfy tourists and local people by managing the area in an optimal way (Papageorgiou and Kassioumis, 2005). Effective planning, management and control are a precondition for a good relationship between protected areas and

tourism (Boo, 1990; Hunter and Green, 1995; Yu et al., 1997). The positive development of tourism depends on successful strategies to limit tourist numbers, inform and educate visitors, and manage and control the area efficiently (Petrosillo et al., 2007).

The sampling effort required for detailed mapping in the underwater environment is greatly increased with respect to the terrestrial one. Therefore, marine natural heritage conservation studies should be designed to provide preliminary information on abiotic heritage values (at relatively low costs and short times) to be implemented and extended for the realization of territorial cartography, which is the basis of territorial management. In this context, the development of common methodological approaches and definitions, suitable for use in different contexts and easily comparable with marine biotic heritage definitions and evaluations is of primary importance (Rovere et al., 2010). In general, the lack of studies concerning the seascape makes planning and managing leisure activities in marine areas more difficult (Piñeiro et al., 2014).

This study aims to create a baseline through the assessment of several rocky-shallow sites located in Bahía de Navidad, from the point of view of “landscape quality” to facilitate the management of the sustainable practice of recreational scuba diving and snorkeling in the area. The generation of this knowledge is very useful (and in many cases essential) for decision-making in the selection of more specific research projects on any feature located within the previously studied area. Therefore, we propose a rapid assessment method, which will provide an overall picture of the state of the physical, biological and environmental features and will describe the rocky-shallow bottoms of this area. Rapid assessment methods are useful, reliable and economically viable, and can provide a comprehensive understanding of the ecological state of broad territorial, coastal and marine areas. For many researchers, they also may be the only financially viable option. A rapid assessment is defined as “a synoptic assessment, which is often undertaken as a matter of urgency, in the shortest timeframe possible to produce reliable and applicable results for its designed purpose” (Ramsar, 2006).

Download English Version:

<https://daneshyari.com/en/article/8060876>

Download Persian Version:

<https://daneshyari.com/article/8060876>

[Daneshyari.com](https://daneshyari.com)