.

Center for Community-Based Resource Management (CBRM)

Natural Resources Institute, University of Manitoba

CBRM Database

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Case Study Name:		Assessing the effects of marine protected area (MPA) on a reef fish assemblage in a north-western Mediterranean marine reserve: Identifying community-based indicators	
Author:		J. Claudet, D. Pelletier, J.-Y. Jouvenel, F. Bachet, R. Galzin	
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Region:		Europe	
Country:		France	
Ecosystem Type:		Aquatic	
Social Characteristics:		Coastal community	
Scale of Study:		Regional	
Resource Type:		Fisheries	

Type of Initiative:	Research driven project
Community Based Work:	Resource management
Keywords:	Impact assessment; Marine protected area; Ecological indicator; Per-mutational multivariate analysis of variance; Multivariate regression trees; Reef fish assemblage; North-western Mediterranean
Summary:	Marine protected areas (MPAs) are increasingly envisaged as a tool to manage coastal ecosystems and fisheries. Assessment of their performance with respect to management objectives is therefore important. A number of MPAs provided conservation benefits for fished species. Observed benefits do not apply to all species at all times, and responses to protection are also highly variable among fish taxa. Among the many empirical studies on marine reserves, only a few designs considered 'before and after data' and spatial variation. In this paper, we are interested in assessing the effect of a no-take reserve on the reef fish assemblage in a northwestern Mediterranean example. Data were obtained from a three-year survey using underwater visual censuses (UVC), before and after MPA establishment. Per-mutational multivariate analysis of variance (PERMANOVA) and multivariate regression trees (MRT) were used to evaluate the effects of reserve protection on the reef fish assemblage, while accounting for habitat. Modelled biological responses were abundances and diversity indices calculated at different levels of the assemblage. Significant effects were found for many of these metrics. In addition to PERMANOVA, univariate models provided more insight into the magnitude and direction of effects. The most sensitive metrics were related to large species and species targeted by fishing. These results may be used to choose the metrics that are more suitable as community-based indicators of MPA impact in the perspective of monitoring programs