Center for Community-Based Resource Management (CBRM)

Natural Resources Institute, University of Manitoba

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Case Study Name:	**Human impact on Paracentrotus lividus: the result of harvest restrictions and accessibility of locations**		
Authors:	G. Ceccherelli, A. Pais, S. Pinna, N. Sechi, L. A. Chessa		
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Region:	North West Italy (Gulf of Alghero)		
Country:	Italy		
Ecosystem Type:	Coastal marine		
Social Characteristics:	Community inside protected area		
Scale of Study:	Regional		
Resource Type:	Fisheries		
Type of Initiative:	Research initiative		
Community-Based Work:	Resource management		
Keywords:	*Paracentrotus lividus*, MPAs, commercial fisheries, recreational fisheries, Gulf of Alghero, Italy, harvest restrictions.		

Summary:	**The sea urchin Paracentrotus lividus is common in the Mediterranean Sea in shallow subtidal rocky habitats, and it is intensely harvested for commercial and recreational purposes. This study is aimed at investigating whether the effects of harvest restrictions of P. lividus in rocky reef habitats interact with the accessibility of locations in structuring sea urchin population (total and commercial- sized individuals). These results are important for generating hypotheses about the influence of human harvesting on P. lividus and for addressing suitable measures of conservation. Paracentrotus lividus was sampled after the end of the sea urchin harvesting period (May–July 2007) within the Gulf of Alghero (North West Sardinia), where the Capo Caccia–Isola Piana Marine Protected Area (MPA) was established since 2002. Paracentrotus lividus was sampled at sixteen locations and attributed in groups of four to 4 combinations of harvest restrictions (Restricted Harvest, RH, vs. Unlimited Harvest, UH) and accessibility (Boat vs. Car), which correspond to a gradient of potential human activity on P. lividus in the ranked order of very low (RHBoatfar), low (RHBoatclose), moderate (RHCar) and high (UHCar). At each location, two depth ranges of 3–7 and 8–12 m were considered. At each of these depths, two areas of about 100-m2 size were chosen. The density of P.lividus was assessed in ten quadrats of 1 £ 1 m, and the size of 100 individuals (test diameter) was considered. Human activity has been found to significantly affect population structure of P. lividus influencing the proportion of individuals larger than 50 mm. Although harvest was restricted by MPA regulations, a significantly lower abundance of large individuals was found at sites accessible by car. This result highlights that there is an effect of harvest restrictions in relation to accessibility and emphasizes the need to carefully address the enforcement of the MPA toward easily accessible sites. Thus, surveillance and investment in enforcement of marine reserves seem crucial points that may provide the greatest return on maintaining the ecological benefits to the fishery activities.**