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An Overview of the Worldwide Involvement of SCUBA Diver Volunteers in Scientific Research Programs

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Abstract

Humans have impacted marine ecosystems for millennia and nowadays there are very few pristine systems anywhere in the world [Myers and Worm 2003].

The ongoing climatic anomaly, leading to a warmer climate at a global scale, is following a sharp trend. Increasing frequency, severity and expansion of mass mortalities related to seasonal stratification (hypoxia/anoxia) or to temperature anomalies were observed in different parts of the Mediterranean [Cerrano and Bavestrello, 2009].

Norse [cited in REEF, 1996, p.2] defines marine environmental monitoring as "the continuing observation of conditions over time" and describes the process as "a crucial tool in the conservation of marine biological diversity" providing managers with important data from which they can make informed decisions. Without accurate monitoring data, properly gathered for specific issues, it is difficult to determine either human or natural impacts on marine systems or specific sites, or how to respond accordingly.

There is almost certainly consensus that science has neither the manpower nor the financial resources to meet the demands that are being placed upon it [e.g. Hodgson, 1999]. However, much of the research that is needed to fulfil biodiversity action plans is labour intensive but technically straight-forward.

Volunteer-based monitoring is a potential solution to this problem representing a potentially huge workforce, and could supplement scarce resources [Fore et al. 2001; Lodge et al. 2006]. Public awareness of the problem of global change and of the biological response to it is also important from a cultural point of view, leading to a better appreciation of the natural environment and to the acceptance of its protection. The use of macrodescriptors, easily recordable even by non-specialists, allows the involvement of laypeople, in order to add further data to those provided by the scientific community.

Volunteers have already made significant contributions to scientific knowledge through their participation in a range of studies, particularly ones that have been guided by experienced scientists. Examples include surveys of the abundance and distribution of waders and wildfowl in British coastal waters [Prater, 1981]; beached bird surveys [Stowe, 1982]; the distribution of Australian birds [Blakers et al., 1984]; changes in benthic and pelagic communities in Jakarta Bay due to organic pollution from the city of Jakarta [Harger, 1988]; coral reef surveys in Singapore [Chou, 1994] and Belize [Mumby et al., 1995]; coastal zone management in Australia [Jacoby et al., 1997; Wescott, 1998]; North Sea pollution studies [Evans et al., 2000] and monitoring juvenile lobsters [Ellis and Cowan, 2002]; NOAA's National Marine Sanctuary volunteer programme [www.volunteer.noaa.gov/ocean_sanctuaries.html], focused on the continuous monitoring of US marine parks. In Northern Europe two relevant projects are NELOS [www.biologie.nelos.be] in the Netherlands and Belgium, and SEASEARCH [www.seasearch.org.uk] in the UK. All these projects are well established, and have developed observation protocols appropriate for their target areas and objectives. The potential of this workforce is especially well-illustrated in the coral programme 'Reef Check' [Hodgson, 1999]. Recreational divers surveyed over 300 reefs in 31 countries in a global survey that was certainly beyond the resources of conventional scientific projects.

The analysis of the distribution of species at a biogeographic scale is fundamental to answer some basic ecological questions. The management of the environment, both terrestrial and marine, requires a detailed knowledge of the distribution of the organisms present on the territory.

The only instrument to permit a right planning of interventions on protection is to know the most suitable environment for a species and its geographical distribution.

Unfortunately, as far as the marine environment is concerned, consciousness is still extremely fragmentary. The distribution of organisms is known on detail only in some zones of the Italian shoreline.

The network, coordinated by Reef Check Italia onlus, will consist on the active participation of recreational divers, who have the task to promote the project and to coordinate the activity at local level, involving others volunteers belonging to any didactic agencies.

Everybody, with experience and passion can give their own contribution. Join the project could be one of the purposes of the courses of Marine Biology for divers, but it could be also the opportunity of diving together with people having similar interests.

Volunteers conduct surveys on their own or during organized field surveys using the Coastal Environmental Monitoring protocol [CEM, Guide 2009]. During CEM surveys, divers swim freely throughout a dive site and record information on target species. At the conclusion of each survey, divers give information also on survey time, depth, temperature, and other environmental information later transferred to the web site of the project [www.reefcheckitalia.it].

Reef Check Italia standardized census method and database management system, combined with partnerships, have resulted in a successful citizen science monitoring program. Volunteer or “citizen” science allows all those who are interested in the resource to contribute to its understanding. Beyond providing valuable data, the increased stewardship that comes from participation in the surveys is vital to the protection of coastal marine resources.