The role of education in marine sanctuary management

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Abstract: Although the need for marine sanctuaries may be becoming more generally accepted, it is still essential to explain the benefits at the local community level when new reserves are proposed. Important goals that may be met through an educational programme include the provision of information concerning new sanctuary management plans and the development of an understanding of, and hence a voluntary compliance with, any regulations proposed by the sanctuary management. The strategies for achieving these goals are put forward in the context of the establishment of the Jubail Marine Wildlife Sanctuary. These include: initiatives targeted to educational establishments and local resource users, lectures, presentations and Sanctuary trips; measures to enhance community involvement, the installation of mooring facilities and beach habitat improvement schemes; use of the media to publicise the Sanctuary and finally the preparation of appropriate educational and informative materials such as guide books and brochures.

دور التعليم في إدارة الحميات البحرية

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خلاصة: على الرغم من أن أقامة الحميات البحرية أصبح الآن أكثر قبولًا إلا أنه لا زال من الضروري شرح فوائد هذه الحميات على مستوى السكان المحليين عند التخطيط لإقامة حميات جديدة. ويمكن تحقيق هدفين رئيسين عن طريق برنامج التعليم الموطنين: أولاً، إعداد المعلومات المتعلقة بخلق إدارة الحمية الجديدة، وثانيهما تطوير الفهم ومن ثم التعود على الأمتثال البحري لكل القواعد والقوانين المقررة من قبل إدارة الحمية. وقد تم رسم الاستراتيجيات الضرورية لتحقيق هذه الأهداف في سياق إنشاء حمية جبل للأحياء البحرية. وتتضمن هذا: مبادرات موجهة إلى المؤسسات التعليمية ومستخدمي المحاصيل المحلية عن طريق المعارض، وتنظيم زيارات للمحمية مع شرح لأهدافها، إحداث الوعي المحلي، ووضع برامج لتحسيس البيئات الشاطئية، بالإضافة إلى الاستفادة من الأعلام لتعريف بالمحمية وأخيراً أعداد وسائل إيضاح تعليمية مناسبة تشمل كتب ومطوريان ونشرات.

INTRODUCTION

Historically our oceans have been viewed as vast bodies of unlimited resources, immense, unchanging and fundamentally unalterable. With the total volume of sea water estimated at some 1,300 million cubic kilometres (Barrett 1981), this is not altogether surprising. The awesome capacity of the sea to be able, apparently, to provide food and mineral resources on a continuous basis, fostered the impression that the marine system had a limitless capacity to absorb all the effects of the human activities taking place in and around it. Hence the sea has become a repository for terrestrial waste, the biological and mineral resources have been relentlessly exploited, and the
capacity for communication and transport of materials abused through a multitude of shipwrecks and pollution incidents such as the Torrey Canyon in 1967 and the Gulf War oil spill in 1991.

More recently, a gradual dawning of the fact that the world’s ocean resources may be finite has become accepted. As pollutants have been discovered in the most remote of the oceans, with DDT in the Arctic and PCBs in marine sediments, as fish stocks have declined through our technical ability to catch our prey faster than it can be replaced, and as the population of the world has substantially increased, the need for marine conservation areas has gained both popular and political support.

With over 70% of the world’s population now living in the coastal zone (IUCN 1975), pressure on coastal resources has become particularly acute, and with increasing economic prosperity and more leisure time a new set of environmental impacts are becoming apparent.

Despite recognition by the public that pollution, over-exploitation and other forms of abuse are degrading the marine environment, there is often considerable local opposition to the establishment of marine protected areas. This may stem from a variety of long-standing misconceptions or from a fear that personal liberties will be removed. Groups that may join forces to oppose the marine sanctuary include fishermen, both sport and professional, and the managers, administrators and businessmen who either have, or wish to have, control over local development and planning options. Secondly, groups that frequently support the establishment of marine sanctuaries such as tourist operators, conservationists, scientists and recreational groups, may change sides if they feel that the sanctuary management is unsympathetic towards their views and aspirations.

One of the major priorities for those concerned with the management of marine sanctuaries is to increase the awareness in the local communities of both the need for the sanctuary and the benefits that will accrue to them, directly or indirectly. Once this need has been acknowledged then an acceptance of the financial and societal costs involved is more likely to be made.

Education has therefore become a key component in the effective management systems of all successful marine protected areas. Education is a very broad term and involves not only the provision and communication of information but more importantly an alteration in people’s conceptual appreciation of the nature and role of the sea in their lives and the lives of future generations. Education becomes the management tool for conflict resolution and the backbone on which other management strategies hang. No sanctuary can hope to enforce its regulations without acceptance from the general public and it is only through an educational programme that the public can be brought to an understanding of the issues such that there can be a voluntary acceptance of the procedures and regulations.

Educational programmes

To be effective the educational programme must have a number of clearly identified goals and develop a series of suitable management strategies to accomplish them. These must be identified at an early stage with a time schedule and budget approved. Educational programmes are expensive. The lack of a suitable educational programme, however, will prove to be more expensive in the long term. A selection of useful texts on the subject of marine reserves and environmental education include: Carson (1978), Hudson (1987), Ballantine (1991) and NOAA (1994).

The single most important component of the programme is the educational leader. It is essential that this person is locally recruited, preferably with roots in the community and with boundless enthusiasm. A background in science education is ideal. Any number of assistants and advisors can be added to the team but the figurehead must ‘speak the language of the people’ both
physically and metaphorically. This is of particular significance in overseas projects where the motives of foreigners and governments are not always crystal clear to the local residents.

The goals formulated may be quite general in their content or may relate to specific aspects of the marine sanctuary. Typical goals that might be included in a management plan are listed below, not in any order of priority:
- to arouse people's awareness and curiosity about their environment and provide them with the opportunities necessary to acquire the knowledge, values, attitudes and commitment that are needed to protect and improve their environment (Department of Education & Science, U.K.)
- to provide information to the public on the policies, aims and objectives of the sanctuary and the results of any research activities being undertaken
- to encourage community participation in sanctuary management, thereby fostering a spirit of guardianship over the marine sanctuary and a recognition of personal environmental responsibilities (NOAA 1994)
- to develop an understanding of, and voluntary compliance with, the regulations proposed in the sanctuary management plans (NOAA 1994)

To achieve the goals outlined above, numerous strategies need to be identified. These typically fall into two broad categories:
1. Community education and involvement
2. Preparation of education/information materials

Community education and involvement

The local community cannot be expected to adhere to the regulations in the sanctuary management plans unless they know that they exist, are familiar with the contents and preferably understand the rationale behind the formulation of these plans (KENCHINGTON 1990). People's views on conservation depend upon their own personal, or subjective, assessment of the value of the environment to them. As far as possible an effort should be made to demonstrate to people that the long-term benefits from the presence of a marine sanctuary will outweigh the extra costs that they will have to bear. Education seeks to assure that the greatest possible user cooperation and support is achieved for the management of the area.

The design of the education programme should be planned with representatives of the target groups that will be addressed. As suggested by KENCHINGTON (1990) these will include but may not be limited to:
- Educational establishments, from primary to tertiary
- Local resource users, fishermen, divers, tourist operators
- Local government, planning and waste disposal authorities
- Non-governmental organisations, environmental and recreational groups

The specific approach and the materials used for each of the target groups will vary depending upon their particular anxieties, their use of the environment and the present level of their understanding of the key concepts that need to be accepted.

Educational establishments

The educational staff should aim to provide lectures and field trips for school children, secondary students and interested adult groups. Long-term benefits are best achieved when these can be fully integrated into an established framework such as a school or college science curriculum. This
involves considerable coordination with the faculty to ensure that the teaching objectives already required can be met by introducing what may appear to be a new element into an already crowded timetable. However important the message may be, teachers are loath to sacrifice their teaching time for new materials unless it can be shown that the established requirements will also be satisfied. As more national curricula introduce an environmental component into their syllabus, the use of marine sanctuaries as examples for ecology, effects of development, pollution and other local issues will become progressively easier.

More timetable flexibility is found in primary and junior schools where classes may be taught by single teachers using more topic work and cross-curricula themes. Here the classical lessons of mathematics, art, language, geography and drama can all be taught using an environmental theme. The skills of observation, data analysis, interpretation, the forming of reasoned opinions, numeracy and communication skills can all be developed through marine environmental studies.

The Jubail Marine Wildlife Sanctuary (JMWS) has initiated such a programme within the local school community in the Jubail Industrial City. Both Arab and international school groups have been visited by the project management and provided with lectures, slide shows and trips to intertidal habitats for basic marine science studies. Visits by classes from Dhahran and sometimes even from Riyadh are becoming a regular occurrence.

A number of education packs and teacher resources have already been prepared by environmental groups and established marine sanctuaries. Examples include: Foster-Smith (1990), 'Ocean Challenge', produced by WWF in South Africa, Cushman (1990), the 'Los Marineros Curriculum Guide' sponsored by the Channel Islands National Marine Sanctuary and the Santa Barbara Museum of Natural History in the United States of America and Whelan & Dartnall (1988), 'Project Reef-Ed' a collection of educational activities developed for the Great Barrier Reef Marine Park in Australia.

Once an education programme has been set up within the school system, the second and most productive step is to commence a series of teacher education workshops. This reduces the direct teaching load on the sanctuary management and devolves the responsibility into the established school system. The sanctuary management is then free to take up more of an advisory role and to develop new programmes.

Local resource users
Depending upon the location of the marine sanctuary and its philosophical objectives, it is likely that there will be a need to balance the demands for recreational activities with those for professional fishing and conservation. The local resource users must be made aware of their rights and responsibilities under the new management plan and efforts must be made to enlist their support for the goals of any new legislation that may be imposed. The two groups most often directly affected are those engaged in selling recreational diving excursions and the local fishermen. Very often there are fears that they will be banned from the area and that their 'historic rights' will be arbitrarily removed. However, the groups in fact often have very similar goals, divers want to see fish, fishermen want to catch fish, and conservationists want stable fish numbers, all in a relatively unstressed ecosystem. Within this context there is considerable 'middle ground' in which the advantages of a marine sanctuary can be made clear to all the different user groups and effective multiple-use zoning strategies are often incorporated into a management plan in order to meet potentially conflicting demands and expectations.

Management needs to recognise the need to balance tourism development with resource conservation to achieve the maximum user enjoyment with the minimum environmental impact (Stewart 1993). Open meetings, slide shows, organised trips or 'natural history outings' to the
area and evidence from sanctuaries in other parts of the world can all be used to allay the fears and
develop a better understanding of the need for the conservation initiative in their area. Such
examples as the Great Barrier Reef Marine Park in Australia, which has a complex multi-use zoning
system, could usefully be cited (CRAIK 1992, AGARDY 1993). This compromise from pure environ-
mental preservation is often a necessary step in order to establish and maintain harmonious
working relationships with the current and future users of the area. No management system can
hope to operate effectively in the face of a generally unsympathetic public.

Local government
Local government needs to be included early on in the development of plans for the establishment
of a marine sanctuary and close contact should be maintained throughout. Specific departments
need to be made aware of the proposed marine sanctuary, its goals and the legislative framework
involved, as there are likely to be several areas in which control and jurisdiction may change.
Planning departments may not be keen to relinquish this control, and waste control authorities
may not be happy if they are required to alter their current discharge procedures. A well-organised
and suitably presented series of informative and educational meetings, held in the early stages of
sanctuary development, will facilitate agreements and negotiations in the future.

Close liaison has been maintained between the Royal Commission for Jubail and Yanbu
(RCJY) and the JMWS throughout all the planning stages for the Wildlife Sanctuary. A plot of
land has been provided by the RCJY for the construction of a permanent research, administrative
and educational centre on the shores of Marduma Bay. Plans for construction have been prepared
by the architectural and design company Bee'ah and site work is anticipated in the near future.

Non-governmental organisations
There are many non-governmental organisations which will be interested and possibly affected by
the establishment of a marine sanctuary. These include clubs engaged in recreational water sports,
fishing, boating, diving and environmental groups, natural history societies, women's social groups
and many others. Most of these organisations are likely to be easily persuaded about the merits
of the proposed plan and may be a valuable source of volunteer labour to be tapped into in the future.

The JMWS has been able to provide numerous lectures and slide shows to local groups and
has run many weekend turtle watching expeditions for the general public. These have proven to be
very useful educational opportunities as a variety of teaching strategies can be utilised, for example:
lecture, audio-visual, and hands-on activities such as volunteer assistance with turtle measuring,
hatchling counting and measurement recording, to reinforce the conservation message.

Local initiatives to improve the environment are becoming more popular with the general
public and help to engender a feeling of community ownership of the new sanctuary and a sense
of responsibility towards their shared heritage. These can take many forms such as: beach clean-up
days, the removal of lost or damaged fishing gear from reefs, and the construction of viewing
platforms or hides near special bird areas. Divers may be keen to set up mooring buoys for their
boats or underwater nature trails and they often have a better knowledge of the area than the new
sanctuary management team. At some marine sanctuaries, locally recruited divers are used on a
regular basis to assist with coral reef and fish monitoring procedures. It is important that the
management capitalise on this enthusiasm and use it as a vehicle for putting over the conservation
messages that are required.

The use of local volunteers expands the legitimacy of the sanctuary, opens new lines of
communication into the community and facilitates the implementation of its objectives. The
JMWS has held meetings to coordinate a plan for the deployment of mooring buoys at the
offshore islands of Juraïd, Jana and Karan, and has received many offers of assistance. The Director of the Marine Department at the National Commission for Wildlife Conservation and Development (NCWCD) has assumed the position of national coordinator for International Coastal Clean-up day sponsored by the Center for Marine Conservation in Washington D.C. and the JMWS will take part in this event.

Volunteers can also play a useful role in sanctuary management and administration once a marine sanctuary has been established and operating procedures standardised. For example, the Queensland Department of Environment manage an information centre at Mon Repos beach, Bundaberg, the site of the largest loggerhead turtle nesting colony on mainland Australia. The retail sales outlet and ticket office is operated solely by volunteers from the community who work from 19:00 to 24:00 midnight throughout the entire egg-laying and hatching seasons.

Preparation of education/information materials

Initially there is a requirement for generating community awareness of the presence of the marine sanctuary, its goals and objectives. This can be achieved by mail shots, either targeted to schools and businesses directly or using a ‘blanket-cover’ approach by arranging assistance with a utilities company such as electricity or water and enclosing information with the monthly bills. Articles in newspapers and popular journals, TV and radio are other suitable media to employ. It is important that a simple brochure or guide is prepared in advance to meet the demand for information that follows. The distribution of ‘soft’ advertising by means of car stickers, badges, T-shirts, calendars and other embossed items assists with this general promotion. There may be a series of public meetings at which the proposals for the sanctuary are presented to the community.

The JMWS management has prepared an address database that has been used to circulate all the schools and primary industries in the Jubail area with information and a Sanctuary brochure. Publicity by means of TV interviews, press releases and articles in local and international journals have helped to inform the public of the plans for the establishment of the Marine Sanctuary.

There will be a need for the production of written and audio-visual materials to support the community education initiatives. Community projects such as quizzes, photographic competitions and school artwork displays may be used to promote public participation. Photographs, once presented, can be used to form the basis of a public lending library if all rights to copyright are waived by entrants to the competition.

Signs and displays need to be set up in the proposed sanctuary area to provide information to the general public about the importance of the area for conservation and the new regulations that will be put into effect. The JMWS has designed notice boards for use on the offshore islands which will be prepared and installed by the NCWCD. Information panels can also be erected in public buildings such as railway stations, hospitals, libraries and local government offices.

At a relatively early stage it is advisable for the sanctuary management to prepare and publish a guide book, written for the non-specialist, which describes the area and its importance for marine conservation. This should be distributed as cheaply as is practicable. Very often sponsorship can be received from large companies operating in the area who see this as a form of advertising and a method for improving their image within the community. A guidebook entitled ‘An Introduction to the Habitats of the Jubail Marine Wildlife Sanctuary’ has been published in both English and Arabic. It includes a brief summary of the geological history of the area, the major water flow patterns within the Gulf, a description of the Sanctuary area and an introduction to the most common animals and plants to be found in the terrestrial, intertidal and subtidal habitats, all fully illustrated with either line drawings or photographs.
CONCLUSION

Although the need for the establishment of marine sanctuaries around the world is gathering pace, there is often an underlying suspicion among the general public when they learn that one may arrive 'on their doorstep'. It is the role of the sanctuary management to enlighten, persuade and convince the public, through a well-structured and targeted educational programme, that the benefits of the sanctuary will outweigh the costs. Over the long term, marine environmental education conducted through the school system, with assistance from the sanctuary management, will produce a growing number of people who understand the underlying concepts and appreciate the presence of the sanctuary and will not become polluters or exploiters of the marine environment in the future.

REFERENCES


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