

Reducing Threats to Turtles

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Around the world, the survival of seven species of sea turtle is threatened by a variety of man-induced factors, including the direct and indirect harvest of adults and juveniles (see Oravetz, this volume), threats to eggs and hatchlings (see Boulon, this volume; Mortimer, this volume), the degradation or loss of nesting habitat (see Witherington, this volume), and pollution of the seas (see Gibson and Smith, this volume). Perhaps no threat is as pervasive and devastating to declining populations as the persistent take of adult and juvenile turtles. The take continues, often in contravention of existing national and international legislation, largely because of familiar and ineffective "top-down" approaches to conservation, and a lack of grassroots support for or understanding of conservation initiatives. In response, conservation organizations and regulatory agencies alike are investing heavily in community-based conservation (see Frazier, this volume). Community-based conservation involves changing habits and outlooks, neither of which happens easily.

Changing Habits

One of the greatest and most complex challenges to the long term conservation of sea turtles is changing the habits of coastal communities in which natural resource use is a vital source of income and essential to survival. Conservation of endangered species has traditionally implied interfering with human survival in such communities. It is necessary to change the paradigm that conservation is a barrier to human survival, or to socio-economic development. Local people who depend on these creatures for their livelihood must be drawn into conservation and research programs which generate direct and indirect benefits to their communities. This is the only way to immediately address the challenge without negatively af-

fecting the socio-economic structure (or potential) of those involved in natural resource use.

Assess and Understand Primary Community Needs, as Well as Potential Program Benefits

In establishing a conservation program, it is essential to evaluate all pertinent socio-cultural issues. To propose viable alternatives, it is necessary to learn about and understand the most important needs of each community, respect local culture, and analyze the role of sea turtles in generating family income. Creating jobs and new environmentally friendly sources of income tailored to each individual community are realistic ways of promoting the conservation not only of sea turtles, but of the ecosystem as a whole.

Alternative ways of life can only be identified and understood when program managers live in local communities. By participating in local celebrations and meetings, witnessing day-to-day problems, identifying natural leadership and organized groups, and helping whenever possible, communication with residents is increased. The information obtained from these interactions is valuable in evaluating practical measures intended to compensate for previous harvesting activities. Community involvement also allows the program to represent or aid the communities in gaining support from government and non-government organizations involved with sustainable development, health, education, and, consequently, conservation.

Program managers and participants should support existing community organizations, such as residential associations, groups of fishermen, schools, cooperatives, and regional producers; to encourage the formation of such groups where they do not already exist so that collectively beneficial activities are carried out; and to actively participate in commu-

nity and environmental councils at local, state, and federal levels, as a means of sharing responsibility and obtaining more support for and knowledge of measures required for implementing conservation programs.

Develop Alternative Programs and New Sources of Income

Program activities can increase community involvement if local circumstances (training, available materials) are considered. Such activities, ranging from production to education, can provide income and disseminate information and culture, heightening environmental consciousness and preparing new generations for the future. Production and marketing of conservation oriented products based on species conservation programs has provided an alternative for financing such activities through a direct relationship with the communities, where profit is reinvested in education, health, jobs, and training. With these objectives in mind, small companies producing clothing (T-shirts, hats, beach wear) or artisan groups may be organized by the conservation program or encouraged to work as cooperatives or individually, always aiming to include as many people as possible.

Before initiating such activities, a budget must be projected which will support them until they become self-sufficient. There are many ways of financing specific social programs, including various inter-governmental development banks, non-government organizations, and government sources. Integrated activities, such as the production of T-shirts in cooperation with a paper recycling group whose product is used as packaging, make more efficient use of local talent, increase profitability and broaden the educational scope of the program. Selective garbage collection is required for paper recycling, and thus those responsible for one project must become involved in related projects, enabling the system to function as a whole.

Many lucrative activities can be carried out by children and young people, as long as these jobs do not replace school (which often happens in developing countries). The formation of links between sea turtle conservation and tourism in suitable communities (that is, in communities where essential infrastructure, including access, is available) can involve a significant percentage of the population and fuel local economies. These endeavors (*e.g.*, small permanent visitor's centers, museums, bars, bed and breakfast facilities, restaurants, craft out-

lets) should aim to provide direct benefits to each community. Economic exploitation "from the outside to the inside", where only a small part of the profits effectively reach the communities, is counterproductive and should be avoided.

Visitor's centers in areas of program activity provide opportunities for direct contact between residents, visitors, and sea turtles. Such centers, which may include a small museum, retail store(s), display tanks containing local species in various life cycle stages, and signs explaining species biology and status, as well as program activities, are important tools for education and fund-raising campaigns. They must be adapted to local characteristics, ranging accordingly from small structures tailored to local demands, to more sophisticated projects capable of accommodating large numbers of tourists. The museum may serve multiple purposes, sponsoring activities such as video clubs, art centers, and school group presentations.

Hiring fishermen to carry out sea turtle conservation and management activities not only provides an alternative source of income, it also makes future resource administration by the community possible. Providing information about more efficient and responsible fishing methods may improve local living conditions and avert stock depletion. Other ecologically viable solutions include changing habits and implementing nontraditional activities, such as managed fisheries, thus exposing young fishermen to conservationist views.

Changing Outlooks

In establishing conservation programs, it is important to identify where gaps exist in the knowledge of the constituencies being addressed. Local communities are indispensable to conservation programs, as are other sectors of society, including politicians, corporate interests, the scientific community, foundations, donors, sponsors, and opinion-makers in general. Public support perpetuates the conservation program, and, consequently, enhances the survival of sea turtles and other target resources.

Those responsible for technical and legal aspects of conservation (legislation in priority feeding and breeding areas, creation of national parks and biological reserves), are often physically distant from the problem, or may not possess basic information on the subject. This is also the case with foundations and sponsors (government, non-government), as well as coastal landowners and developers. As a deeper un-

derstanding of (and public approval of) the pertinent issues increases, leverage is gained for achieving advances in all aspects, including improving legislation, securing financial resources, and garnering further private and public sector support.

It is increasingly important for conservation program managers to understand that technical work plans and personal dedication are insufficient for success. It is essential that the process of securing financial resources for conservation activities be professional and viable. Involvement of executive directors must be complete, integrated to all aspects required for successful project completion, and not only those linked to academia, administration, or conservation. There are many formal and informal ways of promoting environmental consciousness and consequent increases in favorable public opinion.

Environmental Communication and Education

Promotion and development of educational campaigns can be undertaken using various communication tools, such as marketing (publicity, public relations, events, merchandising), mass media (radio, television, newspapers, magazines) and others, including multi-media, flyers, posters, exhibits, oral presentations, debates, and publications regarding program initiatives. Many politicians, businessmen, and institutional leaders, among others, possess neither the opportunity nor the will to learn about conservation program initiatives, including field activities. These are usually carried out in remote areas which are difficult to reach and offer limited accommodations. Therefore, it is important to "bring" these programs to all relevant sectors, using the means described above.

Media interest in environmental issues is on the rise, and can be taken advantage of by providing information regularly to media channels. This presents a difficult task for program directors, whose professional education typically has not included this process. Nevertheless it is as important as field work, for distribution and granting of financial resources, as well as public approval, are often heavily influenced by media coverage. Conservation programs must absorb and use all of the modern communications tools available, just as other public and private institutions do.

The relative ease with which sea turtles can be photographed or filmed, as compared to other wild animals, is a positive aspect of using visual images in publicity campaigns. Images of females nesting, ju-

veniles diving and foraging, and hatchlings crawling to the sea have great visual appeal, and are thus capable of positively influencing public opinion. Incorporating these images in public events, campaigns, T-shirts, festivals, and handicrafts, as well as publicizing the idea of conservation and encouraging various sectors of society to support it, also benefits local community members who emphasize the familiar images in their own marketing initiatives.

Sponsors are more interested in financing programs that provide potential market advantages, where results and achievements can be publicized. Publicity increases institutional, financial, and political credibility. Thus, the "image" of the program must be valued as much as possible. By creating an exclusive logo that identifies the program, it is even feasible to partially finance field work by charging royalties and licensing the logo's use. Programs with well established images are also more easily publicized.

Short institutional videos (12-20 minutes) focusing on project aspects and sea turtle biology are an effective means of presenting a conservation program. Technical films, often too long and too detailed, are not as effective for most viewers. To most efficiently counter the persistent lack of funding besieging conservation, promotional videos and films should be generic and simple, so as to be useful in various situations (communities, sponsors, schools and universities, government and non-government institutions; the videos can also be sold).

A high quality photographic collection is essential for organizing exhibits and talks. It is also useful for compiling teaching materials (*e.g.* pamphlets, posters) and providing images to newspapers and magazines. Those working in the field are most likely to document natural phenomena; thus, it is always a worthwhile investment to include high quality photographic and video equipment in the project budget. Presentations which include photographs, videos, multi-media and other resources in well visited areas (*e.g.* aquaria, museums, schools and universities, retail malls) also increase public awareness of sea turtle conservation.

Support for the conservation program in terms of the legal aspects of protection is secured through a steady and constant relationship with Government. Sea turtle conservation is also promoted by employing lobbying techniques that seek to educate government sectors and demonstrate that cooperation is possible. It is also important to involve renowned politicians in environmental issues, to participate in deci-

sion making, and to share positive results. A priority in meeting program goals should be to undertake an educational campaign that makes use of media channels targeting particular constituencies, such as the policy-making community.

At the grassroots level, integrating the program into daily life ensures that new generations are raised with a more conservationist outlook. Applied methods of environmental education include specific courses and activities (*e.g.* paper recycling, selective garbage collection, junior ecological tour guiding, community gardens) that involve youth groups. It is also useful to include local inhabitants in enjoyable program aspects, such as the release of hatchlings. In this way, sea turtles act as "flagship species", encouraging a general ecological sensitivity and concern. Isolated conservation programs which do not have public support become fragile and vulnerable. Chances for long-term success are increased by support on all levels, from ministers to fisherman.

Secondary and University Student Training Programs

Training programs and internships for secondary, university, or post-graduate students provide practical experience and are vital in educating future conservationists and natural resource managers. Interns should be exposed not only to sea turtle biology, but also to the realities and difficulties of conservation programs. Courses taught in school do not often include community interaction, fund-raising, and institutional representation in varying real life situations. At the same time, programs must also make research that complements conservation activities a priority. Technical co-

operation and partnerships with local and international universities are indispensable in this respect. Universities, besides being focused research institutions, are endowed with financial and human resources usually unavailable to conservation programs.

Evaluating Success

The following milestones should be taken into consideration when evaluating program success: (1) the number of community members involved in the program's conservation, production, and marketing efforts and other related services, or receiving indirect benefits from the program; (2) improvements in quality of life at the community level (*e.g.* education, per capita income, access to consumer goods, health); (3) a decline in the number of nests poached, nesting females killed, and animals captured accidentally or intentionally during fishing; (4) the implementation of specific, effective legislation for the protection of sea turtles; (5) creation of and support for protected areas benefitting sea turtles; (6) profit generated by program products, and the percentage invested in the protection of sea turtles and in local community programs; and (7) an increasing number of community members and others familiar with the sea turtle conservation program.

Acknowledgments

The authors wish to thank Otto Freitas for his help in the final text (Portuguese version) and Eugenia Naro, Alexandre Silveira and Manjula Tiwari for the translation to English.