

THE VALUE OF LOCAL KNOWLEDGE IN SEA TURTLE CONSERVATION: A CASE FROM BAJA CALIFORNIA, MEXICO

KRISTIN E. BIRD ¹, WALLACE J. NICHOLS ^{2AND3}
AND CHARLES R. TAMBIAH ⁴

¹Department of Anthropology, Oregon State University
10421 SE Cook Ct. #328, Portland, OR 97222 USA
Email: kbinsasabe@aol.com

²Wildcoast, P.O. Box 324, Davenport, CA 95017 USA
Email: wjnichols@wildcoast.net

³Department of Herpetology, California Academy of
Sciences, Golden Gate Park, San Francisco, CA 94118
USA

⁴Community Participation and Integrated Sea Turtle
Conservation Initiative 23/4 Sherbrooke Road, West
Ryde, NSW 2114, Australia
Email: turtlecommunity@yahoo.com

ABSTRACT

The use of sea turtles by many coastal communities worldwide remains a part of their traditions and culture despite evidence of decreasing turtle numbers and strict laws prohibiting their harvest and use. There have been great advancements in our understanding of sea turtle biology and behavior, and the science of conservation is continually developing new tools. Unfortunately "science" does not always translate into "conservation" on the ground. As researchers become increasingly aware of the cultural motivations involved in sea turtle exploitation, it becomes critical to shift conservation efforts towards local communities, particularly to the fishers often in the position to make choices directly impacting the fate of turtles. While the ways that fishers have negatively impacted sea turtle populations have been documented, what is often overlooked is how these same individuals can contribute to their conservation. A major goal of community-based efforts in sea turtle conservation is to develop practices which will protect sea turtle populations and habitats that are also compatible with the socioeconomic system and cultural ecology of local resource-dependent communities. Within a conservation mosaic, the incorporation of both biological and social research methods and communication are critical. Analysis of a case study in sea turtle recovery efforts within Baja California, Mexico indicates that community-based research can result in locals actively participating in conservation and providing the knowledge and information necessary to create successful long-term conservation plans. Formation of partnerships through local education, informal conversations, and community meetings are

shown to be a fundamental part of sea turtle conservation. By combining the knowledge gained through scientific investigations, with the insights of the local population, we stand a much better chance of succeeding in recovery efforts, particularly if adaptive management techniques designed through community-based research and action are advocated.

INTRODUCTION

Coastal communities worldwide continue to utilize sea turtles according to their traditions and culture despite evidence of decreasing turtle numbers and strict laws prohibiting turtle harvest and use (Frazier 1995; King 1995; Kowarsky 1995; Nietschmann 1995; Parsons 1962; Tambiah 1989; Tambiah 1995). In northwestern Mexico, and specifically the Baja California peninsula, turtle use originated as subsistence harvest, but over time this use broadened into a directed fishery (Clifton *et al.* 1995; Caldwell 1963). In addition to the food that turtle meat provided for an individual fisher's household, there were increasing economic benefits associated with the sale of turtle meat in the market, both regionally and internationally. Although legislation is now in place to protect Mexican sea turtles, enforcement is prohibitively expensive in such a vast area and fishers have devised elaborate methods of eluding existing enforcement. As such, laws and enforcement have not adequately abated harvest or declines in sea turtle populations, especially in rural areas like Magdalena Bay where laws have been misunderstood or disregarded. As Reichart (1999) suggests, marginalizing the participation of local stakeholders nearly always ensures the failure of such legislation.

Nichols describes the cultural significance of sea turtles in Baja California as having the food quality of filet mignon and the addictive quality of coffee, while possessing the traditional symbolism of Thanksgiving turkey (*SFS Center for Coastal Studies lecture 2000*). Whether you look at turtles from the perspective of cultural traditions, or as an economic or food resource, we believe that sea turtles are arguably among the most important species in northwest Mexican culture.

Of the five threatened or endangered sea turtle species known to inhabit the coastal waters of Pacific Mexico, two species most commonly frequent the waters within and adjacent to Magdalena Bay: the East Pacific green turtle -- or black turtle -- (*Chelonia mydas*), and the loggerhead turtle (*Caretta caretta*) (Clifton *et al.* 1995; Nichols 2001). These are also the species

that are most commonly caught by the fishers of Puerto San Carlos, Puerto Magdalena, and Lopez Mateos, the largest communities on the shores of Magdalena Bay (Gardner and Nichols *in press*). The coastal waters around the Baja California peninsula serve as critical feeding and developmental habitat for these and other sea turtles, after they migrate from as far as Michoacan (Nichols *et al.* 1998) and Japan (Nichols *et al.* 2000b).

Site Description

The Baja California peninsula, which extends into the Pacific Ocean south of the U.S. state of California, is comprised of two states: Baja California and Baja California Sur. The entire length of the peninsula is about 1000 miles (~1,600 km). Magdalena Bay, a large mangrove estuarine complex on the Pacific side of the peninsula, is one of the largest bays in all of Baja and is bordered by several barrier islands. Due to its location between the Pacific and California ocean currents, which allows for a mixture of both warm and cold water species, and the relative protection that the barrier islands provide, Magdalena Bay is a highly productive ecosystem which boasts enormous biodiversity. Mangroves present in this bay are at the northernmost limit of their range; their presence is a unique feature of the coastal ecology which contributes to the high productivity of a bay that has been called “the Chesapeake of the Pacific” (Dedina 2000).

Many of the towns on the shores of Magdalena Bay were settled by *rancheros* (ranchers) from the Santo Domingo valley and surrounding inland areas. While Magdalena bay was first discovered by *Conquistadores* (explorers) in the 14th Century, migration to this region did not commence until the 1920s when inland agricultural projects began to fail and new means of subsistence - shell and finfish - were sought (Dedina 2000). More permanent settlement began in the late 1950's when the cannery and deep-water port projects were initiated in Puerto San Carlos. Since that time, people have continually been migrating to the town. Though many who currently inhabit Puerto San Carlos have lived there for a number of years and consider themselves residents of the area, their roots may lie in other states in mainland Mexico (Bostrom *et al.* 1999). Today, migrant fishers continue to come from the mainland and other parts of the Baja California peninsula in order to exploit the seasonal resources.

Currently, numerous, mostly seasonal, fish camps are scattered along the coastline of

Magdalena Bay. There are also a few permanent settlements, most notably the towns of Puerto Adolfo Lopez Mateos, Santo Domingo, Puerto Magdalena and Puerto San Carlos, which is the largest settlement on the bay. The population of Puerto San Carlos varies seasonally with the fisheries, and ranges between three and five thousand people. The people of Puerto San Carlos have been called “the people of the mangroves” - they form a resource-dependent community (Dedina, *pers. comm.*), relying on marine and coastal ecosystems for their livelihood and survival. While there is a cannery, port and large-scale commercial fisheries, as well as a thermoelectric plant in the area, the community and character of Puerto San Carlos rests on the shoulders of small-scale artisanal fishers and their families. These fishers may be members of a fishing cooperative or one of many *pescadores libres* (independent fishers) in the region.

The Conservation Mosaic

Frazier posed the question: “is increased scientific [knowledge] production conserving turtles?”, stating that “we are learning more and more about what is becoming less and less” (Frazier, *in press*). There have been great advances in our understanding of sea turtle biology and behavior and the science of conservation is continually developing new tools. Unfortunately “science” does not always translate into “conservation” on the ground. As researchers become increasingly aware of the cultural motivations involved in sea turtle exploitation, it is critical to shift conservation efforts to *actively* include local communities, in particular the fishers who are making choices which directly impact the fate of turtles.

Despite inadequate population estimates and utilization assessments, throughout the world fishers have been blamed for declining sea turtle populations, (Caldwell 1963; Clifton *et al.* 1995; King 1995; Parson 1962; Tambiah 1995). As a result, local “science” has historically been excluded from the conservation process and the active participation by fishers in sea turtle conservation initiatives was rarely considered (Nader 1996). Within a *conservation mosaic* (Nichols 2001), the incorporation of both biological and social research methods and communication are critical. Placing value in the opinions, experiences, and knowledge of the fishers, and involving them directly in the project from the first step may form strong conservation alliances.

Over the past decade, local involvement in turtle conservation has been increasing, though generally as directed by an outside “expert” organizing and/or overseeing community work by providing guidance regarding appropriate conservation techniques. Community-based strategies are not new to sea turtle conservation: (see James and Martin; Faulkner *et al.* this vol) such approaches take a variety of forms including community monitoring of lighting practices on nesting beaches, community-based stranding networks and beach patrols, self-enforcement by fishing communities, formal sharing of traditional knowledge (Nabhan *et al.* 1999) and the systematic consideration of interviews with fishers (Tambiah 1999). While such practices are increasing, community-based efforts are still not widely accepted as valid conservation tools (Frazier 1999; Tambiah 2000).

A major goal of community-based sea turtle conservation efforts is to develop population and habitat protection practices that are also compatible with the socio-economics and cultural ecology of local resource-dependent communities (Bird and Nichols, *in press*; Tambiah 2000). In general, however, many of the “community-based conservation” cases documented in the literature have been those in which external researchers have initiated conservation projects and in the process have integrated local community *participation* (Govan 1998; Hackel 1999; Tambiah 1995). Few of these case studies have actually integrated local *science* into the project. In many places around the world, external researchers only have the time and resources to make a snapshot assessment. The typical approach of a research project is to “get in and get out” - gathering as much data as possible as efficiently as possible. Once the data are collected researchers may never return. They may enter the host community with complete autonomy, for instance with their own boat, equipment and food. Alternatively, a special connection can be made through a certain dependence on the host community - for food, equipment, labor and guidance - which fosters trust and builds partnerships. We suggest that such partnerships lay the foundation for long-term successes in conservation.

RESEARCH APPROACH AND METHODOLOGY

Research objectives have been twofold: including both conservation research and active community involvement. Our research consists of socioeconomic studies of current and historic sea turtle utilization within Baja California Sur,

particularly in the Magdalena Bay region, as well as ongoing biological monitoring and ecological studies (Brooks, *et al. in press*; Garcia-Martinez and Nichols 2000; Nichols *et al.* 2001). A variety of data have been collected, including mortality information, diet analyses (Gardner and Nichols, *in press*; Hilbert *et al. in press*), and tissue samples for genetic analysis. Radio and satellite transmitters have been deployed in order to monitor the distribution, movements and long-distance migratory patterns of sea turtles (Brooks *et al. in press*; Nichols *et al.* 1998; Nichols *et al.* 2000b). Local fishers from the community have been involved in all aspects of this data collection, identifying optimal locations and times to set nets, assisting in captures, measurements and marking, as well as informally monitoring turtle movements while fishing on the bay (Nichols *et al.* 2000a). Through their participation, the fishers have learned about the techniques used and the motivation behind our biological investigations. Their sharing of detailed knowledge about the ecology of the bay, including the seasonal movements of marine species and the daily movement of the currents, has contributed immensely to our work by improving the accuracy of the information collected and providing a more complete picture of the sea turtle's natural history.

The partnerships formed with individual fishers have been integral to other aspects of research in the area. Several fishers have helped in the collection of surveys and interviews within their communities. Furthermore, much has been learned about the community's needs and interests related to sea turtle exploitation and conservation in the region. Qualitative research conducted by Bostrom *et al.* (1999) at the SFS *Centro Para Estudios Costeros* (Center for Coastal Studies) in Puerto San Carlos also yielded some important primary data related to the cultural and socioeconomic factors that affect a fisher's decision to capture a turtle, or impact the choice of keeping or throwing back a turtle captured incidentally.

Our research approach seeks to utilize local knowledge and to foster partnerships, which facilitate the exchange of information and active community participation. The following stepwise approach outlining general research considerations for the integration of local science into conservation initiatives was used in this project:

1. The first step involved getting to know who we were working with while allowing them to

know us as more than just an outside researcher: We built trust through friendships and partnerships within the local community and showed respect in our interactions to all individuals.

2. After we made our introductions in the community, we learned about community issues, cultural norms and beliefs. Showing consideration towards personal, local, and regional politics, we worked within the existing socioeconomic framework.
3. While it was acceptable to share the knowledge we possessed with local fishers, (particularly when it was specifically requested), we didn't do all the talking: we spent an equal amount of time asking questions and engaging in participant observation. Both "outsiders" and "insiders" had something to share with and learn from each other.
4. We integrated the local knowledge and information contributed with 'outside' science into an action plan, and implemented the plan with the support, knowledge and *active* participation of the local population.
5. Lastly, we monitored progress and maintained flexibility, following adaptive management strategies.

OUTCOMES AND LESSONS LEARNED

Several meetings have been held within various communities in Baja California and Baja California Sur, the majority being concentrated in the Magdalena Bay area, in order to identify community issues and generate conservation strategies related to sea turtle recovery efforts. Through both formal meetings and impromptu discussions aboard *pangas* (small fishing boats) and in the back of pickup trucks, both local fishers and outside researchers have been engaged in participant observation, learning from each other and incorporating local and outside science into their daily activities (Bird and Nichols *in press*).

Over the past several years, interest in sea turtle conservation has been on the rise due to informal education and outreach initiatives, initially implemented by outside researchers from the United States and Mexico. More recently, we have witnessed some of the local fishers who have been involved in the biological research taking on their own educational pursuits within the region, leading discussions or simply setting examples by releasing turtles that were accidentally entangled in their nets.

Cross-regional communication is also extremely important in sharing knowledge of the implementation of conservation initiatives (Trono and Salm 1999). In August 2000, representatives from several of the fishing cooperatives in Magdalena Bay accompanied outside researchers to exchange knowledge and information with members of the very successful, organized fishing cooperative at Punta Abreojos, BCS. The fishers from Magdalena Bay wished to learn how the Punta Abreojos cooperative was successfully guarding the rich resources of their concession, including sea turtles in Estero Coyote, from outside poachers. Members of the Punta Abreojos cooperative were interested in learning about aquaculture, in which several individuals in Magdalena Bay had been actively involved. Over the course of a few days, sharing meals and going out on the water together, much knowledge was shared.

This interest in sharing information has also helped in the collection of data in the form of recovery of flipper tags placed on sea turtles locally and at distant locations. As word has spread and fishers have become increasingly aware of sea turtle conservation initiatives, flipper tag returns have also increased. Although many of these tag returns represent a dead turtle, it is still a positive sign of the trust and cooperation present within the community. Of particular importance was a tag return from Japan. Because the tag had been on this fisher's key chain for five years, predating any of the results from satellite telemetry and molecular genetic studies, this tag represented the first piece of concrete evidence of the loggerheads' trans-Pacific migrations to Baja California. Awareness of the importance of the information collected created a strong sense of pride within the community.

In recent months, an organized network of sea turtle conservation and monitoring spanning the Baja California peninsula from the Pacific coast to the Gulf of California, including both Baja California and Baja California Sur, has been created (Nichols *pers. comm.*). Through the annual meeting of the Sea Turtle Conservation Network of the Californias (STCNC), started in 1999 and held in Loreto (Baja California Sur, Mexico), several fishing communities have stepped up to say that they are interested in contributing more towards sea turtle conservation efforts through systematic monitoring (Nichols and Arcas 1999). In the past, fishers have known the general movements and distribution of the turtles, but have lacked

the support of numbers. Now, through the coordinated efforts of six dedicated communities, monthly monitoring will enable fishers to attach quantitative weight to their observations. The results of these studies will be shared between communities year round, with additional formal reports at the annual STCNC meetings in Loreto.

CONCLUDING REMARKS

An interdisciplinary approach allows for the utilization of many "sciences" and provides a more holistic view of how sea turtles fit into the grand picture. By avoiding a purely biological and "turtle-centric" approach, and instead investigating the overall turtle habitat, including the cultural and socioeconomic communities of which turtles are a part, our understanding may be greatly enhanced. The inclusion of local people in resource management can provide many benefits. Stronger conservation alliances based on the mutual sharing of knowledge, along with the combination of local science and structured monitoring, may produce the greatest conservation benefits. The objective behind "Western science" of external researchers is not too different from the "local science" of fishing communities. The integration of knowledge generated through quantitative approaches with the knowledge of local fishers may provide the most detailed information -- daily observations, leading to a 365 days/year account of turtle behaviors and movements. We need to contribute our knowledge and accept others'. Recognizing that outsiders and locals share the same goal of conserving sea turtles, we recognize that all involved have a right to be, and indeed, must be, part of the solution.

The foremost challenge remains in recognizing that "Western science" does not have all the answers, nor can it collect all the necessary information in order to make conservation plans materialize successfully (Nader 1996). By looking towards local communities to provide the "missing links" within the data, the time needed to develop the biological and social pieces of the *conservation mosaic* is tremendously reduced. Fishers and other members of local host communities will more readily share their intimate knowledge of their environment, including information on the daily movements and distribution of sea turtles, when friendship and trust are fostered through partnerships. Once the value of local fishers' knowledge is recognized, the next step is the active integration of that knowledge into marine conservation planning and management. In order for this to happen fishers must feel

empowered to participate. In this way, the fishers are viewed, and view themselves, as an integral part of the conservation team contributing valuable knowledge and ideas, not just acting as boat drivers and guides for outside researchers within the host community.

Tambiah states that he would have to spend 365 days of the year living in a community for several years to derive even a fraction of the understanding and information that local people have shared with him in the 15 countries in which he has collaborated. Nichols often remarks that without the help and knowledge fishers have shared with him over his years of work in Baja California, he would have had a far more difficult time finding turtles and collecting information. Without the knowledge shared by local fishers, many attempts at long term marine conservation planning may have been met with minimal success.

ACKNOWLEDGMENTS

We thank the communities of Puerto San Carlos, Puerto Magdalena, and Lopez Mateos for their immense contributions to this work. Many thanks to the staff and students at the SFS *Centro para Estudios Costeros* in Puerto San Carlos, especially Carlos de la Alba, Salvador Garcia-Martinez, Volker Koch, Pamela Kylstra, and Rodrigo Rangel for their ongoing support.

Also, thanks to Hoyt Peckham for valuable comments and critique on this manuscript. We are particularly grateful for the support shown by all of the individuals who granted interviews and wish to acknowledge the fishing cooperatives of Puerto San Carlos and Punta Abreojos for inviting us into their communities. We also thank members of other local communities from different countries who have shared their knowledge and enriched our collaborations.

*K. Bird's participation in this Conference was made possible through funds generously donated by the Conference Events Committee. Thank you.

REFERENCES

- Bird, K.E. and W.J. Nichols. *In press*. Community-based research and its application to sea turtle conservation in Bahia Magdalena, BCS, Mexico. Proceedings of the 20th Annual Symposium on Sea Turtle Biology and Conservation. March 2000. NOAA Technical Memorandum.
- Bostrom, L., E. Craig, E. Donlou, C. Fong, C. Forst, A. Garcia de Leon Ferrer, and A. Smith. 1999. Assessing the demand for sea turtles in Bahia Magdalena, Baja California Sur, Mexico. The School for Field Studies Center for Coastal Studies. Puerto San Carlos, BCS, Mexico. [Unpublished document].

- Brooks, L.B., W.J. Nichols, V. Koch, and A. Hernandez. *In press*. Preliminary results on the distribution and movement of green turtles (*Chelonia mydas*) in Estero Banderitas, Baja California Sur, Mexico. Proceedings of the 21st Annual Symposium on Sea Turtle Biology and Conservation. February 2001. NOAA Technical Memorandum.
- Caldwell, D.K. 1963. The sea turtle fishery of Baja California, Mexico. *California Fish and Game* 49:140-151.
- Clifton, K., D.O. Conrejo, and R.S. Felger. 1995. Sea turtles of the Pacific coast of Mexico. Pp.199-209 in K.A. Bjorndal (editor). *Biology and conservation of sea turtles - Revised edition*. Smithsonian Institution Press: Washington.
- Dedina, S. 2000. *Saving the gray whale: People, politics, and conservation in Baja California*. University of Arizona Press: Tucson.
- Frazier, J.G. 1995. Subsistence hunting in the Indian Ocean. Pp.391-396 in K.A. Bjorndal (editor). *Biology and conservation of sea turtles - Revised edition*. Smithsonian Institution Press: Washington.
- Frazier, J.G. 1999. Community-based conservation. Pp.15-18 in K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois and M. Donnelly (editors). *Research and management techniques for the conservation of sea turtles*. IUCN/SSC Marine Turtle Specialist Group Publication No.4.
- Frazier, J.G. *In press*. Science, conservation, and sea turtles: What is the connection? Proceedings of the 21st Annual Symposium on Sea Turtle Biology and Conservation. February 2001. NOAA Technical Memorandum.
- Garcia-Martinez, S. and W.J. Nichols. 2000. Sea turtles of Bahia Magdalena, Baja California Sur, Mexico: Demand and supply of an endangered species. Proceedings of the Tenth Biennial Conference of the International Institute of Fisheries Economics and Trade. Oregon State University, Corvallis.
- Gardner, S. and W.J. Nichols. *In press*. Assessment of sea turtle mortality rates in the Bahia Magdalena Region, B.C.S., Mexico. *Chelonian Conservation and Biology*.
- Govan, H. 1998. Community turtle conservation at Rio Oro on the Pacific coast of Costa Rica. *Marine Turtle Newsletter* 80:10-11.
- Hackel, J.D. 1999. Community conservation and the future of Africa's wildlife. *Conservation Biology*. 13(4):726-734.
- Hilbert, S.C., S. C. Gardner, R. Riosmena Rodriguez, and W.J. Nichols. *In press*. Diet composition of east pacific green turtles (*Chelonia mydas*) in Bahia Magdalena, Baja California Sur, Mexico. Proceedings of the 21st Annual Symposium on Sea Turtle Biology and Conservation. February 2001. NOAA Technical Memorandum.
- King, F.W. 1995. Historical review of the decline of the green turtle and the hawksbill. Pp.183-188 in K.A. Bjorndal (editor). *Biology and conservation of sea turtles - Revised edition*. Smithsonian Institution Press: Washington.
- Kowarsky, J. 1995. Subsistence hunting of turtles in Australia. Pp.305-313 in K.A. Bjorndal (editor). *Biology and conservation of sea turtles - Revised edition*. Smithsonian Institution Press: Washington.
- Nabhan, G., H.Govan, S.A. Eckert, and J.A. Seminoff. 1999. Sea turtle workshop for the indigenous Seri tribe. *Marine Turtle Newsletter* 86:44.
- Nader, L. (editor). 1996. *Naked Science: Anthropological inquiry into boundaries, power and knowledge*. Routledge Press: New York
- Nichols, W.J. 2001. *Biology and conservation of the sea turtles of the Baja California peninsula, Mexico*. Ph.D. Dissertation. Dept. of Wildlife and Fisheries Science, University of Arizona, Tucson.
- Nichols, W.J. and F. Arcas. 1999. First meeting of the Baja California Sea Turtle Group held in Loreto, Mexico. *Marine Turtle Newsletter* 85:19.
- Nichols, W.J., K.E. Bird, and S. Garcia. 2000a. Community-based research and its application to sea turtle conservation in Bahia Magdalena, BCS, Mexico. *Marine turtle newsletter* 89:4-7.
- Nichols, W. J., L. Brooks, M. Lopez, and J.A. Seminoff. 2001. Record of pelagic East Pacific Green Turtles associated with *Macrocystis* mats near Baja California Sur, Mexico. *Marine Turtle Newsletter* 93:10-11.
- Nichols, W.J., A. Resendiz, J.A. Seminoff and B. Resendiz. 2000b. Transpacific migration of the loggerhead turtle monitored by satellite telemetry. *Bulletin of Marine Science*. July 2000.
- Nichols, W.J., J.A. Seminoff, A. Resendiz, P.H. Dutton and A. Abreu. 1998. Using molecular genetics and biotelemetry to study life history and long distance movement: A tale of two turtles. In: S.P. Epperly and J. Braun (compilers). Proceedings of the 17th Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-415.
- Nietschmann, B. 1995. The cultural context of sea turtle subsistence hunting in the Caribbean and problems caused by commercial exploitation. Pp. 439-445 in K.A. Bjorndal (editor). *Biology and conservation of sea turtles - Revised edition*. Smithsonian Institution Press: Washington. .
- Parsons, J. 1962. *The green turtle and man*. University of Florida Press: Gainesville.
- Reichert, H.A. 1999. Grassroots stakeholders and national legislation. Pp. 221-223 in K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois and M. Donnelly (editors). *Research and Management Techniques for the Conservation of Sea Turtles*. IUCN/SSC Marine Turtle Specialist Group. Publication No. 4.
- Tambiah, C. R. 1989. Status and conservation of sea turtles in Sri Lanka. In: K.L. Eckert *et al.* (compilers). Proceedings of the 9th Annual Workshop on Sea Turtle Conservation and Biology. NOAA Technical Memorandum NMFS-SEFSC-232.
- Tambiah, C. R. 1995. Integrated management of sea turtles among the indigenous people of Guyana: Planning beyond recovery and towards sustainability. Proceedings of the 12th Annual Workshop on Sea Turtle Conservation and Biology. NOAA Technical Memorandum NMFS-SEFSC-361.
- Tambiah, C. 1999. Interviews and market surveys. Pp. 156-161 in K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois and M. Donnelly, (editors). *Research and Management Techniques for the Conservation of Sea Turtles*. IUCN/SSC Marine Turtle Specialist Group. Publication No.4.
- Tambiah, C. R. 2000. "Community participation" in sea turtle conservation: Moving beyond buzzwords to implementation. In: H. Kalb and T. Wibbels (compilers). Proceedings of the 19th Annual Symposium on Sea Turtle Conservation and Biology. NOAA Technical Memorandum NMFS-SEFSC-443.
- Trono, R.B. and R.V. Salm. 1999. Regional Collaboration. Pp.224-227 in K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois and M. Donnelly (editors). *Research and Management Techniques for the Conservation of Sea Turtles*. IUCN/SSC Marine Turtle Specialist Group. Publication No. 4.

NOTE: For more information and on-going progress on sea turtle conservation activities discussed in this case study see web-site: www.wildcoast.net