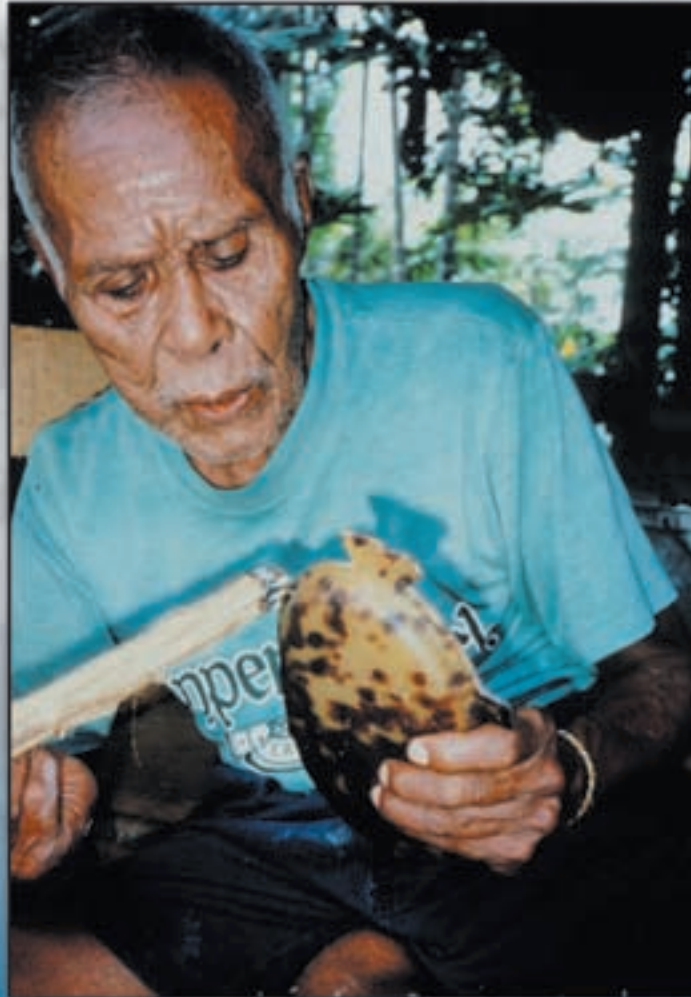


SEA TURTLES, THEIR MANAGEMENT, AND POLICY IN THE REPUBLIC OF PALAU

An Assessment of Stakeholder Perception



Crafting tortoise shell women's money, Toluk • Meyuns, Koror

A REPORT BY THE PALAU CONSERVATION SOCIETY

Sea Turtles, Their Management, and Policy in the Republic of Palau: An Assessment of Stakeholder Perception

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“...Without access to extensive financial and scientific resources, it is unlikely that Palau’s decision makers will ever have, in the foreseeable future, enough locally collected scientific information to justify making decisions about changes in turtle management policy based on conclusive evidence and traditional scientific standards...”

— Resource Manager

* * *

“...One can say we have been doing these things since time immemorial, and that it will be hard for us to change. However, we can accept new ideas and information, and give them to schools and younger generations... to give a consistent education [and an] awareness program over a number of years with someone constantly minding the program. I like this project, and I support it ...”

— Kathy Kesolei

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Cover photo: Crafting tortoise shell women’s money, *Toluk* • Meyuns, Koror (1995)

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EXECUTIVE SUMMARY

This report is the product of a consultative process that was initiated to share and discuss issues of sea turtle management in the Republic of Palau. The apparent decline of sea turtle populations in Palau has been a concern for many years. Several reviews conducted over the past decade make recommendations to improve Palau's turtle management regimes and to promote the recovery of locally existing turtle species. Recent consultations with various stakeholder groups were designed to explore these management issues and begin a process of information-sharing regarding the status of sea turtle populations in Palau. These results are hereby made available for the consideration of Palau's general public and decision makers.

Topics discussed during consultations included those related to the value, use, and status of sea turtles, as well as the perceived effectiveness of current regulations and proposed management alternatives. Basic findings were that Palauan sea turtles are a highly valued, increasingly commercialized, and rapidly declining natural resource. Existing regulations appeared ineffective to many respondents with regards to long-term sustainability and management of sea turtle resources. Participants identified various limitations and failures in existing management and legislation for controlling turtle use. While little consensus on specific management approaches was developed among consultation groups, it was clear that there is a great need for the Republic of Palau to improve the implementation of management approaches related to sea turtles. Results of this review pointed to many local needs, including a revised policy, greater education and awareness, and stricter enforcement of existing and/or future regulations. While gaps were identified in Palau's national-level sea turtle policy, many participants made recommendations on how to improve current conditions and management strategies.

Although existing scientific information on the status of Palau's sea turtle populations is not comprehensive or sufficiently in-depth, the overwhelming consensus of fishermen and residents indicates a marked decline in the sightings of individual turtles, both in the waters and on the nesting beaches of Palau. Taking into account the impact of persistent and developing threats to sea turtle populations, general recommendations and objectives for turtle recovery relative to the existing management framework are made. Relative strengths and weaknesses of existing legislation and proposed options are also discussed. In order to facilitate consideration of various alternatives that emerged from stakeholder consultations, four (4) policy options based on different management approaches are suggested. These options share the following:

- A complete prohibition on all take of hawksbill (*ngasech*) turtles.
- Stricter regulation of green (*melob*) turtle take.
- Improved enforcement mechanisms.
- Formal protection of turtle nesting habitat.

In order to complement management options, additional recommendations are also offered, such as enhancement of policy through international conventions, improvement of enforcement effectiveness, and increasing public awareness of sea turtle biology and recovery measures.

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1 OVERVIEW

1.1 SEA TURTLE RESOURCES OF PALAU

The lives of the Palauan people have always been influenced by the resources of the sea around them. For millennia, Palauan society has depended on the diversity and abundance of fish and other organisms found in coastal waters. Within this setting, the use of sea turtles has evolved with Palauan society and its changing culture, creating a strong relationship between human and turtle that continues to this day.

Palau's 237,800 square miles of ocean, including 560 square miles of nearshore waters and coral reefs, support an abundant and diverse array of marine life that provides food and income to Palau's estimated 19,000 residents. Managed under different regimes and political systems over the centuries, coastal resources have waxed and waned according to biological cycles of reproduction, levels of human exploitation, natural events, and other factors. This holds true for Palau's sea turtle populations. Highly valued, turtles and their use have long been attributed a special significance that to this day distinguishes marine turtles from other creatures of the sea. This status has led to the development of distinct social practices, traditional industries, and revered indigenous customs that have become intertwined with the very fabric of the coastal cultures that make up the present-day Republic of Palau. Despite modern changes affecting dietary and cultural norms, the relationship between turtles and local residents has remained important and unique.

Five species of sea turtles are known to live in the Palauan waters: the hawksbill or *ngasech* (*Eretmochelys imbricata*), the green or *melob* (*Chelonia mydas*), the leatherback or *bekuu* (*Dermochelys coriacea*), the olive ridley or *metau* (*Lepidochelys olivacea*), and lastly, the loggerhead (*Caretta caretta*) turtle. Both the hawksbill and green turtle are the most common in Palau's waters and are also the only two species known to nest on Palau's beaches. These species live a specialized existence in the ocean and on land, migrating thousands of kilometers between nesting beaches and foraging grounds to complete their reproductive life-cycles.

Sea turtles, their use, and management, have a rich tradition in the Republic of Palau. While sea turtles in

Palau have long been associated with basic sustenance, they also symbolize social preference, status, as well as cultural meaning and identity, custom, and recently, increasingly individual and group economic goals.

Sea turtle populations, once ubiquitously abundant in tropical and temperate areas of the world, are now facing serious challenges to their survival. Recently, a significant number of individual populations of marine turtle species throughout the world have undergone an alarming decline, and in some cases, even local extinctions. The reasons for this decline are multiple, yet are all linked to the following: 1) sea turtles' slow growth, 2) naturally occurring high mortality in early life stages, 3) specific requirements for reproduction, 4) over-exploitation by humans, 5) commercialization of sea turtle products, 6) modification and/or degradation of habitat, 7) increased interaction with fisheries, 8) predation by non-indigenous species, and 9) dependence on multiple habitat types. The most significant threats¹ affecting sea turtle populations in Palau appear to be related to human activity: the direct harvest of turtles by humans, and the modification and degradation of sea turtle nesting habitat.

Early Micronesian societies may have recognized the unique biological characteristics of sea turtles and developed cultural practices that played a role in the long-term maintenance of turtle populations. For centuries, traditional fishing methods and customary rules regarding the use of turtles provided a sound context for the organized management of turtle populations on many islands and in various cultures (McCoy 1974). In traditional Palauan and Western Carolinean societies of Sonsorol and Hatohobei, resource use practices contributed to and were influenced by the status of traditional chiefs (Johannes 1981; Johannes and Black 1981). Despite the steady erosion of traditional authority and governance related to the management and maintenance of sea turtles, the importance and concern of sea turtle conservation and management remain. Efforts to reach a balance between use and conservation of sea turtle populations, formerly enforced by traditional authority, have been borne by a new centralized government. This shift from traditional (localized) to

contemporary (centralized) management is reflected in national-level policy and regulations aimed at conserving turtle populations. However, some argue that compared to traditional management, modern centralized management has been less effective in regulating turtle harvest. Anecdotal information and observations over recent decades point to marked turtle population decline and to simultaneous increases in local harvest in Palau. Given these observations, together with growing awareness of sea turtle biology and population trends worldwide, many resource managers and members of the Palauan public have become increasingly concerned about the effectiveness of the strategies currently being applied for the protection and use of local turtle populations.

1.2 THE REVIEW AND CONSULTATIONS

This review of existing information and assessment of perceptions related to Palauan sea turtles, their use, and management, was designed to initiate a multi-stakeholder consultation process and policy review. Specifically, the purpose of this review and consultations was to foster and enhance the understanding of decision-makers, resource managers, and the general public regarding the special and important issues related to sea turtles in the Republic of Palau. A team of Palauan conservation specialists and sea turtle experts conducted twenty-five individual interviews and seven group consultations, extending over various regions of Palau. The Palau Conservation Society assisted with the coordination and implementation of this study through the facilitation of meetings and language translations, as well as with the dissemination of the findings.

“How well are our existing methods for sea turtle management working?”; “How much have turtles declined?”; and “As a nation, how well are we doing to ensure the continued existence of sea turtles in Palau’s future?”—these are recurring questions of resource

managers and the general public of Palau. Concurrent with these local concerns are concerns about global and regional efforts to assess, monitor, and manage populations of sea turtles. These efforts have led to the production of management plans, strategies, and programs to repopulate and better manage sea turtle populations both regionally and locally. The assessment and evaluation of the biology, status, and threats to sea turtle populations guided recommendations for the recovery of six (6) sea turtle species within the U.S.-affiliated Pacific (for examples see NMFS and USFWS 1998a, 1998b).

These recovery plans, combined with a drafted but unimplemented Sea Turtle Management Plan for Palau (Maragos 1992), as well as with other recommendations for local sea turtle management (Guilbeaux 1995a, 1995b; SPREP 1995), offer a comprehensive set of assessments and Palau-specific recommendations. These recommendations for the improvement of Palau’s turtle management framework have yet to be presented in a manner that is sufficiently open and that is able to incorporate the opinions of the Palauan public. While requests for information on sea turtles from various interest groups and communities have either increased or remained consistent, effective engagement and consultation on sea turtle management issues with most stakeholder groups have long been lacking.

During this study, interviews and consultations were used to explore and uncover perceptions of various stakeholder groups regarding status trends of turtle resources, the extent of local use, and effectiveness of current regulations. Specifically, this effort was intended to 1) compile recent and relevant data, 2) review existing information of sea turtle populations, 3) assess stakeholder perception of turtle use, status, and management, and 4) develop educational materials and activities to share these findings with the general public of Palau.

Key Findings

Overall, the compiled results of all held consultations and interviews suggest the need for a much greater degree of attention to sea turtle management and conservation within the Republic of Palau. While sea turtle resources are highly valued in Palau, long-standing management approaches have proven to be inadequate in terms of providing effective, sustainable management and use of local sea turtle populations. Contributing factors to this condition include weak national interest to pursue stricter measures for sea turtle management, inherent difficulties with enforcement, and other problems linked to inhibiting social contexts. Despite these obstacles, there exist positive elements in contemporary Palauan society that may influence responsive and precautionary measures required to contribute to the recovery and the sustainable management of local turtle populations. Other key findings of this study include:

Groups consulted unanimously perceived that local sea turtle resources are declining... Nearly all participants perceived that both foraging and nesting populations of hawksbill and green turtles have declined within Palau over the past ten (10) to thirty (30) years. This perception is not new, as it has been reported for decades in sea turtle management reviews. Fishermen indicated that sightings of large sea turtles have decreased steadily in past years. Likewise, turtle nesting has also been found to be in decline on most beaches, and on some to have virtually ceased altogether. Palauan women reported that turtle shell money (*toluk*) is noticeably smaller in size than those produced in previous years.

The commercial sale of sea turtle products is increasing... While subsistence and cultural uses remain important aspects of direct harvest of sea turtles in Palau, there is a perception that turtles are being hunted increasingly for economic benefit. Many fishermen stated, in fact, that they would rather not hunt turtle because they have noticed the depletion of local turtle stocks; however, the growing market for green turtle meat and turtle shell makes it very difficult for them to pass up the opportunity for quickly-earned cash. Concern is expressed about the increasing frequency and number of green turtles being transported aboard vessels returning from the Republic's Southwest Islands to Koror, with many of these turtles destined for informal commercial sale. Tourist gift and jewelry stores now carry a wider array of hawksbill turtle shell products than ever before.

Beyond knowing that national sea turtle regulations exist, few people knew the specifics of these regulations... Lack of understanding and/or knowledge

about current regulations was prevalent. Furthermore, a lack of basic knowledge of sea turtle biology and enforcement activities hindered judgment as to whether or not existing laws were adequate. Information on sea turtle biology shared with participants often led to revisions in their suggestions for improving localized sea turtle management.

...however, many identified a critical need for clear standards under which turtle regulations can be enforced. The lack or insufficiency of enforcement were among the most often cited reasons responsible for the current problems facing local turtle populations. Not only is enforcement of turtle regulations difficult from an operations point of view, but also the practice of selective enforcement and selective prosecution pose obstacles to stakeholder compliance and cooperation. Many felt that those with money or status could easily violate existing regulations with little concern for punishment, a condition they felt severely undermines the general public's compliance and support of sea turtle regulations.

More information on Palau turtles is desired by the general public... Those who depend on or value turtle resources frequently requested more information. However, it was often suggested to focus sea turtle awareness and educational campaigns on the young. Many felt that older individuals have a highly developed preference for turtle meat and that efforts to change behavior and personal preference through awareness would be better received by younger generations. At the same time, it was recognized that elders have a significant role to play in promoting the conservation and recovery of Palau's remaining sea turtle populations.

2 METHODS

From May 2000 to May 2001, the Palau Conservation Society collected information from a variety of sources related to sea turtle management within the Republic of Palau. This report is a result of that work, and includes analyses of literature, expert knowledge, interviews, stakeholder consultations, and market surveys related to the exploitation, value, trade, use, distribution, abundance, and regulation of Palau's sea turtles.

Investigation of these topics involved a literature review, and an appraisal of recent turtle research and previously recommended management options, alternatives, and modifications to Palau's current turtle regulatory framework (see Appendix 1). An annotated list of management measures generated over the past decade for enhancing recovery, conservation, and management of sea turtles in the Republic of Palau, can be found in Appendix 2. Because of the need to communicate these recommendations in a more succinct form with stakeholder groups, a summary list of these recommendations was formulated (see Appendix 3). Advice from local coastal resource experts provided guidance for the list's further refinement and combination with a fact-sheet that was used in community consultative processes (see Appendix 4).

Consultations with relevant stakeholders proceeded in a series of three steps: 1) preliminary interviews with knowledgeable individuals, 2) discussions held by various stakeholder groups, and 3) focused interviews that complemented group discussion results and followed up on topics of particular concern and interest. Preliminary interviews were conducted in order to confirm the relevancy and range of discussion topics. Group meetings were conducted to uncover opinions and areas of consensus from a spectrum of stakeholder groups on various key topics. Stakeholder groups that were consulted varied in terms of their geographical origin, ethnicity, professional position, and social class. During group meetings, topics were introduced and discussed to elucidate degrees of consensus and/or disagreement among participants. Subsequent to group meetings, additional inquiries, market surveys, and individual interviews with expert and regular participants were conducted.

These provided the setting for further discussions on previously discussed topics and additional topics related to sea turtle recovery, conservation, and management. Stakeholder groups, organizations, and agencies were also consulted specifically on information related to sea turtle nesting distributions and their respective numbers.

Stakeholders' views on sea turtle management-related issues, themes, and alternatives were discussed and assessed in a total of seven (7) group consultations and twenty-five (25) interviews (see Appendix 5 for participants list).

Topics included:

- 1) The value of turtles in a modern and cultural context.
- 2) Community perceptions of turtle use.
- 3) Perceptions on the current status of sea turtle resources.
- 4) The perceived effectiveness of current regulations.
- 5) Current views and suggestions on proposed management alternatives.

Meeting minutes and interview responses were recorded, translated from Palauan to English as needed, and transcribed by project team members². After meetings and interviews were concluded, responses were collated according to subject (see Volume II of this review for a record of perceptions gathered from consultations). The degree of consensus among respondents was evaluated qualitatively by the project team according to group discussion dynamics and an assessment of interview responses³. In topical areas, in which clear consensus on an issue was impractical or impossible to determine, a list of alternative opinions, sentiments, potential options, and/or widely held beliefs was generated. It is important to note that this report's findings relied primarily on the evaluation of stakeholders' perceptions on the status, trends, use, and key management issues related to Palauan sea turtles, rather than on ecological field observations or on expert scientific opinion.

3 CONTEXT AND EXISTING FRAMEWORK FOR SEA TURTLE MANAGEMENT IN PALAU

3.1 RESOURCE MANAGEMENT CONTEXT

Prevailing guidance for sea turtle management in Palau today is provided by the governance established by Palau's modified federal system of government, its Constitution, and formalized regulatory statutes. Statutes directly pertaining to sea turtle management exist at a national level. Additional statutes can also be enacted at a state level, a condition that has allowed several states to pass supplemental turtle management laws subject to national constraints. Furthermore, in some areas of Palau, customary and/or localized management is recognized and practiced to a greater or lesser degree, which may or may not conflict with national and/or state regulations concerning sea turtle use. These national, state, and local rules, together with all other sea turtle related policy, create a framework for sea turtle management in Palau.

Historical Sea Turtle Management

Traditionally, sea turtle use in Palau and the Southwest Palauan Islands (Sonsorol, Pulo Anna, Merir, Fana, and Hatohobei) was managed and controlled within a context of customary marine tenure. Within this customary system, local chiefs extended their exclusive control over coastal areas and fishing grounds associated with nearby villages (Johannes 1981). Within this context, exploitation of prized marine animals, which included sea turtles, was closely regulated by chiefs and other traditional authorities⁴ (also McCoy 1974; Johannes 1986; Black, personal communication, 2000). Furthermore in Palauan society, closely aligned age-graded village organizations or clubs, the women's *cheldebeheldi'l* and the men's *cheldebechel sechal*, exerted strict control over their members and served as a mechanism of social cohesion within the village structure (Otto 1997). These conditions and social systems appear to have provided a strong framework for the regulation and use of sea turtles. Nonetheless, within this system, a well-developed material culture and industry based on sea turtle products⁵, especially items made from sea turtle shell, thrived, as is described by ethnographers Kubary

(circa 1885) and Kramer (circa 1910). Interaction with European and other foreign powers began a pattern of gradual change in resource management in which resource use became more and more influenced by commodification and introduced management systems. While it is not known to what degree German and/or Japanese colonizers extended their influence in the management and use of sea turtle resources among Palauan or Southwest Island residents, it is clear that these foreign powers initiated changes in existing harvest patterns. In the pursuit of trade in marine commodities, of which sea turtles played a key role, colonizers and foreign authorities modified customary resource use practices, in part by the appropriation of human labor, and in part by additional changes in governance their presence brought about. Increased harvest and export of sea turtles and their products followed as foreign traders and occupiers initiated the capture of Palauan sea turtles (Semper 1873; Hezel 1980; Johannes 1986) on an unprecedented scale⁶.

Increasing Centralized Governance and Marine Resource Management

After WWII, the administration of the U.S. Trust Territory of the Pacific Islands⁷ (TT) initiated a novel era of sea turtle management in Palau that progressed towards a new, centralized management system. District resource management agencies and Trust Territory-wide regulations were developed at this time. Codification of laws and centrally-led policy making in Palau contributed to the continual erosion of traditional authority over marine resource management (Graham 1998). Ownership of marine resources was transferred from traditional village jurisdictions to newly instituted states; however, national ministries and their subordinate agencies became vested with the responsibility of managing these same resources at a national scale. Once official authority and responsibility to enforce regulatory laws were given to national agencies, increasing difficulties with management of marine resources ensued. Modern centralized management in Palau remained limited in its effectiveness,

lacking the resources, capacity, and localized connections needed to replace the former, well-integrated customary regulation that had existed for generations. During this period of diminished customary control and lagging centralized management, increased availability of motorized fishing vessels and other recently available technologies (*e.g.*, modern fishing gear) escalated the exploitation rate of marine resources in growing isolation of the traditional conservation ethics that had existed before (Johannes 1981). Harvesting regimes and management of sea turtle populations in Palau were, beyond doubt, greatly affected by these changes.

Foundation of Palau's Current Policy and Statutes

Changes in sea turtle policy associated with the TT period in Palau (1947–1994) began with Naval control immediately after WWII. The Naval administration included “Interim Regulations”, which contained prohibitions and limitations on the harvest of sea turtles (Richard 1957 in McCoy 1997). Regulations were later codified basically unchanged into TT regulations soon after the establishment of the Trust Territory by the United Nations in 1947 (Richard 1957:1248 in McCoy 1997)⁸. These regulations, entitled the “Limitations on the Taking of Turtles (referred hereinafter as the “Limitations”) remained in effect throughout the duration of the TT (administered by the U.S. Department of the Interior⁹) with very little modification¹⁰.

Palau, along with all other Trust Territory Districts, became technically subject to additional sea turtle export and import regulation under the international jurisdiction of the Convention on International Trade of Endangered Species (CITES), when the U.S. became a signatory of the Convention in 1975¹¹. Hawksbill turtles became a legally protected species throughout all of the Micronesian TT districts under the TT Endangered Species Act of 1975 when the species was officially listed in 1976 (Territorial Register 1976). Yet additional sea turtle protection came into effect in 1978 in Palau due to its association with the U.S. when green and hawksbill turtle Pacific populations were respectively classified and listed as “Threatened” and “Endangered” under the U.S. Endangered Species Act of 1973 (U.S. ESA¹²).

When the Pacific populations of green turtles were listed in accordance with the U.S. ESA in 1978, an exemption for “subsistence”¹³ take was included that would allow for the continued taking of green turtles

for the personal use by residents of the Trust Territory¹⁴. Consideration of this exemption was based on the fact that the Pacific green turtle populations were classified by the U.S. ESA as “Threatened” but not “Endangered”, and on the following criteria: 1) the customary nature of turtle take in the Micronesian “low islands”, 2) the take for personal or family consumption, 3) the absence of alternative food sources, 4) effect upon the green turtle populations, and 5) enforcement aspects. As McCoy points out, “this action granted an exemption to all inhabitants...of the Trust Territory irrespective of any differences in the real or perceived dependence upon sea turtles for subsistence” (McCoy 1997).

Reasons for this particular Trust Territory-wide exemption within the U.S. ESA resulted in a NMFS legal review in 1984 (Farrell 1984:16, cited in McCoy 1997).

- “Turtle meat and eggs were a traditional, customary source of food in the region and the taking of green sea turtles were an important part of the culture of certain inhabitants in the area...”
- “The agencies were also persuaded that the green sea turtle meat provided a major source of food for many island residents.”
- “The agencies concluded that a subsistence harvest conducted in the traditional manner would not have a major impact upon the existing population of green sea turtles in the region”.

These protective policies were intended to prevent possible population decline and extinction of threatened wildlife, and to provide an effective mechanism for population recovery with the ultimate goal of delisting species classified as endangered. Consequently, until the termination of the TT, Palau witnessed various overlapping of protective sea turtle regulations: first those of the U.S.-administered TT (through the Limitations on the Taking of Turtles), then those of CITES, next those of the TT ESA (related to hawksbill turtles only), and lastly those of the U.S. ESA. All overlapping TT- and U.S.-derived sea turtle regulations not adopted into the Palau law (from 1981 to 1994¹⁵) ceased to apply when Palau assumed its full internal autonomy and the authority to conduct its own for-

ign affairs in “free-association” with the U.S. in 1994. While the TT Administration during this time acknowledged the importance of the conservation of turtles, existing agencies had difficulties in establishing effective management over turtle species (Owen 1977, 1978; Wilson in McCoy 1997; Pritchard 1977; Milliken and Tokunaga 1987). The specific restrictions on take and use of turtles were seen by many as difficult to enforce and seldom observed¹⁶. While customs agencies and enforcement agents were cited as being relatively successful in reducing the extent of export and commercial trade, harvest for in-country uses appears to have remained a significant impact on local sea turtle populations¹⁷. The sale of hawksbill shell products and jewelry has a long history in Palau, with the volume of sale rising and falling concomitantly with the degree of regulation (Owen 1978). The most recent account of commercial turtle shell sales was provided in 1992 by Maragos (1992) when it was reported that the sale of turtle shell products at various gift shops in Palau had effectively ceased.

Compounding difficulties in enforcement, many of the U.S.-derived restrictions on sea turtle take were at the time not viewed as the responsibility of the Palau’s TT Government to enforce¹⁸ or even potentially conflictive (Cassell *et al.* 1992). These restrictions appear to have been regarded by most Palauan policy makers and government agencies as an annoyance left-over from colonial times, amounting to a hindrance to economic development to some and to others an obstruction to the practice of indigenous cultural and subsistence use. With enforcement difficulties being greater than could be surmounted by natural resource and enforcement agencies, it appeared that the U.S. and TT Administrations acquiesced to the inherent limitations in enforcement (Owen 1978; Farrell 1984, U.S. Department of Interior 1993), and only intermittent periods of intervention with respect to local sea turtle regulation and enforcement by U.S. and Palau governments, if any, occurred during the period from 1978 to 1994¹⁹.

Although efforts have been made in Palau to implement sea turtle conservation and enforcement over recent decades, it has become clear to many that overall management of marine turtle resources has remained inadequate to maintain sustainable populations (or even reduce the likelihood of local extinctions). Sea turtle populations in Palau have long been perceived to be in a state of decline and/or ill management (Owen 1977; Johannes 1986). In some areas, turtle

nesting populations are known to have diminished to a mere fraction of what they once were. As standards of living increase and market economies continue to develop in contemporary Palau sea turtles are increasingly involved in commercial activities. In Palau, it appears to many that the capture and harvest of turtle is becoming more of an issue of the perceived right to earn income, rather than a right to use. Violations of national turtle management regulations and locally initiated state laws are known to occur in varying degrees. In various customary and modern contexts, throughout Palau the direct taking of sea turtles, in violation of and in accordance with national regulations, remains commonplace.

Currently, sea turtle policy in Palau is derived principally from national statutes adopted largely from the former TT administration. Aside from these regulations, there is no other formalized policy (*e.g.*, approved management plans, policy statements, management objectives, etc.) to provide guidance for the management of sea turtles in Palau. The statutes themselves offer relatively little direction in sea turtle management due to the fact that the Limitations on the Taking of Turtles (24 PNCA 1201) do not provide a purpose, management principles, or specific objectives. Palau’s Endangered Species Act of 1975 (24 PNC 1001-1012), adapted from Trust Territory Public Law, may be applicable to Palauan sea turtle species, however this statute has not been enforced in Palau for many years. Confusion and long-standing tensions between internal (Palauan) and external foreign-imposed (U.S. or the U.S. administered TT) policy have resulted in an environment of ambiguity and ambivalence that hinders effective sea turtle management. Local customs of turtle use, changing balances of power and authority, and competing external influences (mainly from the United States Government and in some cases other foreign organizations²⁰), has led to ill-defined national policy that lacks clear direction and enforceability. Turtle conservation and sustainable management was recognized as an important concern in the recent past (Helfman 1968; Hendrickson 1972 in McCoy, 1974; Pritchard 1977; Owen 1978; Lecky and Nitta 1985, in McCoy 1997; Johannes 1986; Cassell *et al.* 1992), but so have potential conflicts with customary²¹ use and subsistence practices. U.S. “foreign” laws, related to endangered species and applicable to Palau at the time, were often regarded as imposing, restrictive, and perhaps more importantly, were not well understood by the general

public. In recent decades, Palau's government appears to have chosen policy paths of least resistance, such as supplemental attempts to hatch and raise hawksbill turtles artificially through mariculture, rather than placing stricter limitations on sea turtle use or providing greater enforcement of existing turtle laws.

Since Palau's autonomy and its newfound ability to make and follow its own rules, the situation with respect to local turtle conservation and management has remained in a precarious state. Compliance with and enforcement of existing regulations appears low, as it has for decades (see Owen 1976; Geermans 1992). While there have been a number of citations and prosecuted cases concerning the violation of turtle regulations, ambiguities with respect to interpretation of the law remain. This is particularly true in a number of alleged cases in which traditional rights are questioned and/or asserted²², or when the lack of legal interpretation and precedence has confounded the implementation and enforcement of existing statutes²³. In some cases, prosecution of known violations is oftentimes not pursued because of the status of the individuals involved. It appears, however, that while turtle populations have been declining, not enough effort has gone into enforcement, prosecution, surveillance, or any other action capable of curtailing the reduction of already diminishing marine turtle populations. In fact, a good case can be made that when ever attempts were proposed in the direction of further restricting direct take of turtle, these attempts were met with resistance from those who defend the right of Palau citizens to partake in customary use. The issue of customary use lies at the heart of the dilemma, for while it may in Palau's best interest to conserve and maintain its turtle populations so that customary use can continue, the fact that sea turtles provide food and economic benefit to Palauans makes it uncomfortable for legislators to take steps in the direction of stricter regulation of turtle take. However, these actions are becoming clearly necessary to ensure the continued and secured existence of turtle populations. A case in point is Palau's hesitance—despite nearly a decade of encouragement from national proponents and the international community—to join the CITES convention, which would further assist conservation by placing stricter restrictions on the international trade of endangered species and their byproducts. While it is left to speculation what the reasons for this reluctance may be, the fact remains that there is a perceived conflict of interests between customary use and con-

servation efforts with regard to Palau's sea turtles. General attitudes appear to be shifting, however, as more emphasis is being placed on improving environmental policy. For example, Palau's recent ratification in June 1999 of the Convention on Biological Diversity (CBD), may represent a significant step towards the development of a new trend to improve management policy by enhancing the protection of threatened biological resources. However, it appears that the greatest challenge to sea turtle management in Palau lies at the community and stakeholder level.

3.2 EXISTING MANAGEMENT FRAMEWORK

Sea turtle management in Palau is primarily implemented through a multi-level modern framework of governance. At the highest level, Palau's constitutional government provides a system of rules and mechanisms for regulating sea turtle use and promoting resource sustainability²⁴. At subsequent levels, Palau's sixteen (16) state governments have rights of resource ownership and use within their established geographical jurisdictions. As stated above, these states can create management systems of their own to regulate natural resources, including sea turtles. Associated to a greater or lesser degree with Palau's state jurisdictions, are traditional leaders and a system of customary marine tenure that provides additional foundations for turtle and other marine resource management. These management framework aspects are covered below.

3.2.1 Contemporary Governance Structure

Although Palau's government is modeled after United States constitutional democracy, Palau's Constitution distinguishes itself in that it grants special recognition and limited power to traditional authority. Direction for resource management is constitutionally based on national level policy mechanisms. However, this national structure allows considerable flexibility and autonomy for local governments and traditional authorities to enact and implement their own laws or edicts (Graham 1998). In most cases, state governments and local tenure rules provide guidelines for localized use and management of resources, which in turn are subject to the limitations and constraints of national laws and policy²⁵. Therefore, laws and regulations concerning the management of sea turtle resources can be enacted at both national and state

levels. Additionally, traditional authority may or may not have a significant influence on how sea turtle resources are used and managed locally, since traditional involvement and acceptance varies from place to place.

3.2.1.1 National Government Statutes

The most widely-observed regulations related to sea turtles are statutes that apply nationally. Of these, the most prominent is the Limitations on the Taking of Turtles, which forms a simple code of regulation adopted from the Public Laws of the former TT Administration. Other relevant legislation adopted from the TT Administration includes Palau's Endangered Species Act of 1975 (the Palau ESA). This Act additionally has the potential to serve as a framework for the enhanced management of sea turtles and other species determined to be in need of protection. Furthermore, national level legislation that relates to the establishment of protected areas may help to maintain turtle habitat. These protected areas may in turn limit harvest effort within these established zones by restricting human entry, particular uses, and/or certain activities. Implementation and enforcement of national laws are the joint responsibility of various Ministries, Divisions, and Boards; of these, the most important are the following: the Ministry of Justice, the Ministry of Natural Resources and Development, and the Divisions of Public Safety, Marine Enforcement, Conservation and Entomology, and Marine Resources. The Office of the President, at its own discretion, can also exert its executive power on sea turtle management by authorizing certain practices and special activities. These agencies may also, from time to time, implement and/or support programs and activities that relate to sea turtle management and conservation, such as research, community outreach, and education.

A description of national level legislation potentially relevant to sea turtle management is provided below.

Limitations on the Taking of Turtles

Adopted directly from the former TT Code, The Limitations on the Taking of Turtles (24 PNCA 1201) provide a simple regulatory framework for the management of sea turtle populations. Although a legislative purpose was not included within these statutes,

it is reasonable to infer that these regulations were aimed at balancing turtle resource use with the need to ensure long-term sustainability. The approach chosen for the attainment of this goal includes setting controls on the season of take, minimum size, and the activity and lifestage of the turtles to be legally taken. Regulations do not address how harvested turtles are ultimately used; however, they do provide special take exemptions regarding scientific purposes. Maximum fines and jail terms were also established (see Appendix 6 for further details).

Palau Endangered Species Act

As was mentioned above, the Palau Endangered Species Act (24 PNC 1001-1012), once fully implemented, could fortify Palau's existing regulatory framework concerning sea turtles. Originally part of TT Public Law and later adopted into the Palau National Code, the statute is a much simplified version of the U.S. ESA designed to protect vulnerable animal and plant populations within Palau's geographic area:

“The indigenous plants and animals of the Republic are of esthetic, ecological, historical, recreational, scientific, and economic value. It is the policy of the national government to foster the well-being of these plants and animals by whatever means necessary to prevent the extinction of any species or subspecies from our islands or the water surrounding them” (24 PNC §1003).

Compared to the Limitations, the Palau ESA sets more stringent sanctions against violators, and addresses issues of take, use, permitting, traditional practices, culturing of specimens, exportation, and importation. Overall, the Palau ESA provides a more controlled and comprehensive framework for sea turtle management and recovery in Palau; yet, the Act has remained latent and largely un-implemented for nearly two decades. Reasons for the disuse of this particular statute could be related to an inability to ascertain legal changes related to the shift of TT Administration to Palau's current government; an inability to determine the status of certain species and subspecies to be classified under the statute; and/or a general lack of political will and ability to implement and enforce the Act. Regardless of the various possible

reasons, the administrations of Palau have yet to incorporate the implementation of the Palau ESA into its national threatened species (and sea turtle) policy. While efforts to amend the Act, assess the validity of former TT-era species lists, and create Palau-specific regulations to be used to implement Palau's ESA have been considered over the years, for reasons of practicality managers, enforcers, and courts of law have relied on the Limitations of the Take of Turtles as the main policy mechanism for turtle management within the Republic.

National Legislation Establishing Protected Areas

Two nationally mandated protected areas afford additional protection to turtles by placing restrictions on entry and fishing within established boundaries²⁶. These include²⁷:

- Ngerukewid Islands Wildlife Preserve (12 km²): No extraction of any kind; no habitat disturbance.
- Ngerumekaol Spawning Area (0.3 km²): No fishing during April 1–July 31.

Besides providing an additional degree of protection to turtles from harvesting while in protected areas, the Ngerukewid Islands Wildlife Preserve offers additional protection to beach habitat, nesting turtles, and their eggs. Both of these marine protected areas (MPAs) are located within the jurisdiction of Koror State and are supported by similar state-level legislation.

3.2.1.2 State Government Statutes

Some individual states have made attempts to manage sea turtle resources within their jurisdictions by establishing state level legislation and sanctions. Within Palau's constitutional government, individual states are allowed to organize their own government and to pass state-specific laws that can afford additional protection to local turtle populations within state boundaries. Constitutionally, states retain certain rights of ownership and management of natural resources within their respective geographical jurisdictions. While the extent of these rights is not always clear in relation to the scope of roles and responsibilities reserved for the national government (see Graham 1998; Daleiden 1999), many states have made signifi-

cant progress in developing initiatives to manage resources that are of concern. Some of these initiatives rely largely on mirroring customary management practices, while others involve integration or combination of innovative approaches to local level management.

Because Palau's states possess the authority to create their own independent state governance, they can, for example, establish their own law enforcement agencies, which several states have already done. Although these agencies can enforce state laws, they are not technically authorized to enforce national laws (including national turtle regulations) unless specifically granted authorization from the national government to do so. However, national government enforcement agencies do have the power to enforce state laws at their own discretion, although state laws tend to occupy a lesser priority.

State efforts related to the management and protection of sea turtles comprise 1) moratoriums and complete bans on the take of specified species, 2) the take of a species during a particular life-stage, 3) the implementation of protected areas that in turn limit fishing and/or protect habitat, or 4) a combination of these. For example, in Kayangel State, legislative and traditional leaders approved the creation of the Ngeruangel Reserve Management Plan that provides full protection to hawksbill turtles and restricts the number and purposes for which green sea turtles may be harvested from Ngeruangel Atoll, a locally enforced protected area. Likewise, since 1995 the Hatohobei State Government has set in place specific legislation to provide additional protection on sea turtles (Hatohobei State Public Law Number 3-16). The Hatohobei legislation places a fifteen-year (15) moratorium on the taking of hawksbill turtles and prohibits commercial sale of green turtles originating from this state's jurisdiction (see Appendix 6). Other states, such as Koror, have implemented no-fishing and limited public access areas that offer an additional degree of protection to free-swimming turtles, as well as to nesting turtles and their eggs. And while the states' additional rules and their enforcement could provide for more efficient sea turtle management, many of Palau's states lack sufficient funds, effective institutional structures, and more crucially, the motivation to go beyond the written word and implement these initiatives.

In addition to statutory approaches, some Palauan states have initiated specific projects that attempt to

enhance the management of sea turtle resources. For example, the State of Sonsorol recently initiated the construction of what is intended to be a sea turtle mariculture facility on the Island of Merir. The objectives of this mariculture project, financed with funds from the National Capital Improvement Program, are to help reverse trends associated with dwindling green turtle populations, especially the decline of nesting females. A problem with initiatives such as these is that they are developed without making use of existing traditional and scientific knowledge.

3.2.1.3 Customary Controls and Local Practices

Customary resource management and local practices also play an important role in sea turtle management. These rules or codes of behavior can range from customary traditional rules and established controls, to common local practices and ethics associated with turtle management or their harvest. Local customs and practices such as self-imposed limits or taboos mentioned by Johannes (1986) exist in certain localities. Over the past decade traditional local leadership has experienced instances of resurgence through the assertion of traditional powers and responsibilities. This is especially true in the sector of marine resource management, in which chiefs have recently reasserted their authority and established traditional restrictions and area closures (*buls*) in an effort to improve the condition of affected resources. For example, as of 1995, channel passes of Kesol Reef are jointly managed by Kayangel and Ngarchelong States and are seasonally closed to all forms of fishing by traditional law.

Regrettably, not all traditional leaders are involved in the management and conservation of sea turtles. Some traditional authority figures may encourage and/or organize sea turtle taking, for example, by requesting turtles for certain occasions. In most instances, former turtle take prohibitions are no longer observed or have become untenable. In Hatohobei

and Sonsorol, for example, up until the late 1960s and the early 1970s, citizens followed strict restrictions set by chiefs on the taking of turtle (Sonsorol State Official, personal communication); today, these conservation and management practices have largely been abandoned by the local populace. Although a return to traditional forms of resource management in Palau is regarded as a potentially effective strategy, enforcement of these approaches could be viewed as problematic in certain cases (*e.g.*, traditional and modern enforcement cannot mix).

3.2.1.4 International Conventions

A relatively new addition to natural resource and biodiversity management frameworks in Palau is the Republic's participation in the Convention on Biological Diversity (CBD). By becoming a signatory in 1999, the Republic of Palau became eligible for CBD-related environmental funding programs, as well as responsible for fulfilling national obligations associated with the Convention. The Convention requires signatory countries to take appropriate action through policy development and management to control the degradation of biological diversity, habitats, and ecosystems within their jurisdiction. Furthermore, the Convention places an obligation on Parties to make reasonable efforts in establishing a system of protected areas, rehabilitating and restoring degraded ecosystems, and promoting the recovery of threatened species. The CBD can be an important mechanism for the effective management of Palauan sea turtle populations, as these populations are an important element of Palau's biodiversity and are considered to be sensitive populations threatened with local extinction. Furthermore, turtle management is likely to be enhanced through increased regulatory control and the development of a protected area system that maintains critical sea turtle habitat, two elements promoted by the CBD.

4 CONSULTATION AND INTERVIEW RESULTS

CONSENSUS AREAS OF GROUP CONSULTATIONS AND INTERVIEWS

Findings of perceptions and recommendations are reported in this section. Finding summaries and degree of consensus (or uniformity) are presented in the associated tables.

4.1 VALUE OF TURTLES IN A MODERN AND CULTURAL CONTEXT

Stakeholders' perceptions of the value of sea turtles were separated into two broad sub-categories:

1) **The value of turtles in a modern context:** the importance of turtles in a contemporary sense, including economic, nutritional, and other generally material values (Table 4-2).

2) **The value of turtles in a cultural context:** the importance of turtles in a traditional, non-commercial, and/or spiritual sense, or any other non-material values significant within present-day Palauan culture and society (Tables 4-3 through 4-6).

4.1.1 Value in a Modern Context

4.1.1.1 Economic Value of Turtle

The economic value of turtles in this study pertains to the market price that turtles or turtle products command in Palau's cash economy. For example, it can be the price that is paid for a fisherman's catch or a craftsman's turtle shell jewelry.

Many respondents provided their perception of the local market value of turtles. Ranges of estimated monetary valuations for various turtle species and

Table 4-1. Estimated Monetary Value of Turtle Products in the Republic of Palau, Based on Stakeholder Consultations and Market Surveys, 2000–1.

Item (in US Dollars)	Approximate or Average Price or Price Range*
Melob - Green Turtle	
Green turtle (whole, un-butchered) paid to fisherman	\$1.00/lb
Green turtle (divided, butchered) paid to fisherman	\$1.25/lb
Large adult green turtle, paid to fisherman	\$200–500
Small juvenile green turtle, unspecified weight, price example	\$80–100
Green turtle meat sold commercially at market (prepared)	\$2.75/lb
Ngasech - Hawksbill Turtle	
Large adult hawksbill turtle, paid to fisherman	\$300–600
Small juvenile hawksbill turtle, unspecified weight, price example	\$100–200
Average-sized, newly made <i>toluk</i> (quality unspecified)	\$45–100
Price paid to convert hawksbill scutes into <i>toluk</i>	\$10–20
Valuable heirloom <i>toluk</i> of the highest quality and value	> \$1000
Turtle shell jewelry, wide bracelet, at a tourist gift shop	\$35–45
Turtle shell jewelry, earring set, at a tourist gift shop	\$12–25

*Prices are dependant on turtle or shell size and fluctuate according to supply and demand.

products are reported (Table 4-1).

Most fishermen groups indicated that increased market demand played an important role in motivating the hunting and catch of turtle. In some outlying villages, a significant number of turtles, it was indicated, were harvested specifically to meet Koror’s market demand. Some fishermen and stakeholder groups indicated that they experienced a conflict of conscience between the opportunity to earn quick cash and their own perception of the need to reduce harvest pressure on turtle populations they themselves assessed were in danger of depletion (Table 4-2).

4.1.1.2 Health/Nutritional Value

Nutritional and health values relates to the health and nutrition that is derived from the consumption of turtles and turtle eggs. Sea turtles are a source of

nutrition. In fact, because of their size and the quality of their meat, sea turtles are perceived as a highly valued, nearly “perfect” food. Sea turtle derived protein has for a long time been perceived unequivocally as a valuable contributor to Palauans’ health and nutrition, but it was not generally seen by respondents as a necessary dietary component in contemporary Palau. The percentage of turtle meat consumed relative to other food items was not ascertained within these consultations²⁸ (Table 4-2).

4.1.1.3 Value to Tourism

These values relate to the existence of turtles in relation to the tourism market in Palau. Although a relationship was suggested by some, consultations did not precisely indicate how the presence of turtles might enhance the experience of aqua-tourists, who

Table 4-2. Perceptions Related to Modern Values of Sea Turtles.

Topic/Issue		Findings	Degree of Consensus
Economic Value (4.1.1.1)	Commercialization of turtle products.	Commercial demand greatly motivates turtle harvest in Palau.	High.
	Growing commercialization of turtle products.	Negatively impacts turtle populations.	High.
Nutritional/ Health Value (4.1.1.2)	Necessity of turtle as dietary protein source (general).	Turtle is not required as dietary component; other protein foods are readily available.	High.
	Necessity of turtle as protein source in outlying remote area.	Turtle is regarded as not essential for human nutrition and survival in remote areas, in most cases ²⁹ .	Mixed.
	Perceived nutritional value of turtle.	High-quality, inexpensive source of protein.	High.
	Problems with diet/health if turtles are not eaten?	No: Enough other sources of food available ³⁰ .	High.
	Contemporary medicinal uses of turtle.	Undetermined/unknown.	n/a.
	Percentage of contemporary diet composed of turtle.	Undetermined/unknown.	n/a.
Tourism Value (4.1.1.3)	Non-extractive or existence values of turtles relative to tourism in Palau.	Marginally perceived as beneficial to enhancing local tourism.	Unknown.

in turn stimulate the local economy (Table 4-2).

4.1.2 Value in a Cultural Context

4.1.2.1 Socio-cultural Significance and Value (General)

Socio-cultural value pertains to a broad range of benefits derived from turtles in Palauan society as perceived from a cultural perspective. Generally, turtles and the use of turtles in Palau were perceived to have a special value in a broad range of important cultural purposes. These ranged from the use of turtle products in forms of traditional exchange (*toluk*), to the benefits of social cohesion and basic enjoyment. The use of turtle also signifies a culturally-bound sense of identity, and independence from foreign food sources (Table 4-3).

4.1.2.2 Historical - Cultural Identity

Associations with animals can provide societies with cultural references to the past and present. Sym-

bols, stories, and legends are important vehicles for these associations. Many legends and stories involving sea turtles exist in Palau. Some of these are closely associated with Palauan identity and are represented with pride in contemporary society³¹. In some instances, particularly in the case of Southwest Islanders, connection to turtle resources and their use was expressed as an important part of their cultural identity (Table 4-3).

4.1.2.3 Preferences for the Types or Characteristics of a Particular Turtle

Different turtle species, sexes, and sizes relate to various preferences and attributes associated with these distinctions. Results indicate that green turtles are preferred for their meat³², and that larger green turtles are generally preferred over smaller ones because of a higher fat content and the greater social significance attributed to securing a larger catch. Hawksbill turtles are preferred for their shell, with a secondary importance being placed on the meat. Larger, older hawksbill turtles are the preferred target of harvesters due to

Table 4-3. Perceptions Related to Socio-Cultural Values of Sea Turtles.

Topic/Issue		Findings	Degree of Consensus
Socio-cultural Significance (General) (4.1.2.1)	Turtle as a cultural resource.	Turtle is perceived as a cultural resource.	High.
	Sea turtle characteristics.	Turtle... "is clean". "is healthy". is protein rich. "tastes so good". is locally raised. is cheap and inexpensive. feeds many. "makes everybody so happy". "is our food". "is part of our cultural practice".	High.
	Characteristics attributed to sea turtles.	Mellow creature. High endurance. Non-greedy animal.	n/a.
Historical-Cultural Identity (4.1.2.2)	Importance of legends and storytelling involving turtles in contemporary Palauan society.	Unknown/undetermined.	n/a.
	Connection to and use of sea turtles.	Important part of cultural identity.	Mixed.

the larger, thicker scutes, generally used for making *toluk* and other turtle shell products. Adult female turtles are preferred over adult male turtles of both species because of the females' generally-perceived higher fat content and the possibility of obtaining eggs still inside a gravid female turtle.

There are some notable exceptions to these preferences: mainly that some participants claimed to prefer the taste of smaller turtles, while other participants felt that hunting small turtles for household use in remote areas was preferable so as to not let the turtle meat go to waste. Others mentioned that smaller turtles were easier to hide on their boats and sell once they returned to Koror (Table 4-4).

4.1.2.4 Related to Taste/Food Preference

The taste of turtle and its relation to food preferences can be an important consideration for conservation and management efforts. Taste was identified as an important factor related to turtle capture and consumption. In some cases, turtle meat was described as too good and too tempting to resist. Many participants went as far as to describe the taste of turtle as “addictive,” while others did not consider the taste of turtle meat to be as compelling. Respondents described a direct correlation between the age of consumers and their preference for turtle meat. Furthermore, respondents also believed in a correlation between a deeply-seated preference for turtle meat and the long-standing difficulties affecting successful turtle conservation efforts. Because of preferences for turtle meat and its long-standing use by older people

who were “fixed in their ways,” it was often suggested to focus conservation efforts on younger generations who had not yet developed a strong taste for turtle meat. However, some believed that in many cases, even younger generations were already well accustomed to eating turtle meat, as well as sea turtle eggs (Table 4-4).

4.1.2.5 Enabling Qualities of Turtle

The procurement and use of turtles are associated with values beyond purely monetary or nutritional concerns. Some of these values are associated with qualities of turtles that can contribute to prestige and social status, collective cultural values widely-held by Palauan residents. Others qualities are associated with specific functions and bestowed attributes connected to the use of turtle in Palauan society. Collectively, these are labeled in this review as the “enabling” qualities of turtles. Various dimensions of prestige and social status are applied to those who consume turtles as well as to those who procure them. In addition, sea turtles can serve multiple roles in many social functions (Table 4-5).

4.1.2.6 Spiritual and/or Religious Significance of Turtle

Spiritual or religious associations with turtle are believed to play important roles in historical use and function of turtles in the Palau and the Southwest Islands³⁴. Related to spiritual use and practice is the observance of particular taboos that deal specifically

Table 4-4. Preferences Related to Turtle Characteristics.

Topic/Issue		Findings	Degree of Consensus
General Preferences (4.1.2.3)	Most desired characteristics of green turtle.	Large. Female. High fat content. Gravid (<i>i.e.</i> , with developing eggs inside).	Mixed.
	Most desired characteristics of hawksbill turtle.	Large. Female. Gravid (<i>i.e.</i> , with developed eggs inside).	High.
Taste Preferences (4.1.2.4)	Taste of sea turtle.	Described by some as causing craving, described as addictive by some.	Mixed.
	Taste and younger generations	Taste for turtle not as well developed in younger generations.	Mixed ³³ .

with sea turtles. The results of these consultations did not determine whether there are current spiritual and/or religious practices directly related to sea turtles. There were not sufficient indications to support

the existence of contemporary spiritual use, as could be determined by individual and/or group reactions to this topic^{35,36}. The extent to which sea turtle related taboos are still practiced at present is unknown. No

Table 4-5. Expressed Value of Turtle Related to Customary

Topic/Issue		Findings	Degree of Consensus
Enabling qualities of turtle (4.1.2.5)	Functional non-monetary roles of sea turtle in Palauan society.	Can feed a large group of people. Is regarded as a special food. Can be used as a food reserve to honor special people. Provides an opportunity for sharing in the practice of distribution (e.g., the building of social ties, providing means for exclusion from group). The sharing of which invites reciprocation. Bestows status and prestige to capturer, as a provider and a leader. Capture of which is viewed as a proud, difficult event. Provides the opportunity for excitement, camaraderie and fun during hunting. Symbolic of commitment to the needs of others.	High.
Spiritual/ Religious Significance (4.1.2.6)	Spiritual or religious function of turtle.	None known to be commonly practiced in contemporary Palauan or in Southwest Island society ³⁷ .	High.
	Taboos in existence.	None are known to be commonly practice in contemporary Palauan or in Southwest Island society ³⁸ .	High.
Present ethno-medicinal uses of turtle (4.1.2.7)		None known to be commonly practiced in contemporary Palauan or Southwestern Island society.	High.
Required uses of turtles in ceremonies (4.1.2.8)	Turtle requirements as food at a ceremonial or customary event.	Only during the confirmation of a title-holder.	High.
	Requirements of hawks-bill turtle for traditional customary purposes.	Exchange of <i>toluk</i> ³⁹ .	High.
	Meat reserved for use by particular persons.	Not known to be readily or commonly practiced in contemporary Palauan or Southwest Island societies ⁴⁰ .	High.
Use in other customary events (4.1.2.9)	Meats culturally required at funerals.	Pigs required; turtles not.	High.
	Turtle meat at funerals or any other customary function or public event.	Increases the prestige of the event.	High.

responses to inquiries indicated that turtle-related taboos were presently practiced to any significant degree (Table 4-5).

4.1.2.7 Ethno-medicinal Uses of Turtle

These uses relate to any current medicinal purposes associated with the consumption or use of any sea turtle product. Discussions among Palauan or Southwest Island groups did not reveal any indication that sea turtle consumption is in any way related to medicinal purposes (Table 4-5).

4.1.2.8 Required Use of Turtles in Customary Ceremonial Events or Practices

Ceremonial or other customary events and/or practices were defined in this review as organized events that were inherently and distinctly Palauan, though not necessarily related directly to spiritual and/or religious purposes and practices. Regarding ceremonial and customary use of sea turtle in Palau, when asked during a July 2000 interview, *Bilung* Gloria Salii said the following:

The only ceremony or ‘Custom’ when a turtle is required is when the *Ibedul* with his hat has to wash his hands in the turtle blood. The other custom is women’s [*toluk*] money.

Other responses to inquiries about the value or use of turtles at ceremonial or customary events were similar. The practice of reserving turtle meat for only chiefs or high status individuals, as may have been done in the past (Barnett 1979), is no longer regarded as a common practice in present day Palau (Table 4-5).

4.1.2.9 Significance of the Use of Turtle in Other Customary Events

Other customary sea turtle related events include traditional funerals, “First Birth” ceremonies, and other important, distinctively Palauan cultural events. In cases of customary events or practices, such as *omersurch* or *ngasech* birth ceremonies, *ocheraol* house ceremonies, *kemeldiil* funeral services, and other “Custom” events, respondents indicated that these were events to which turtle meat added prestige, but that was not a necessary element. Respondents often added that certainly turtles made the events “nicer”

and more significant, but that they were not required, *per se* (Table 4-5).

4.1.2.10 Value of Toluk

Toluk is a form of traditional Palauan women’s money that is made from hawksbill turtle shell. *Toluk* is exchanged between women as a form of compensation for various types of service. The persistent demand of shell used for the fabrication of new *toluk* is considered one of the main factors contributing to the harvest of hawksbill turtles in Palau. The value of *toluk* varies according to each piece’s physical and aesthetic characteristics. *Toluk* is an essential part of highly revered customary exchange practices among women (Table 4-6).

4.2 COMMUNITY PERCEPTIONS OF TURTLE USE

4.2.1 Turtle Use (General)

The concept of “turtle use” can refer to the amount, purpose, or function of turtle utilization. While the information provided may be useful as a rough estimate of turtle harvest and use, it must be mentioned that the results are in no way intended to substitute a more thorough, quantitative assessment of turtle utilization.

Sea turtles are used for a variety of purposes and fulfill certain functions that are part of Palauan culture and contemporary society. From a basic point of view, turtles are used for food, income, and other socially and culturally significant uses—and none of these uses are necessarily mutually exclusive. Participants shared the opinion that fishermen hunted turtles opportunistically (that is, whenever turtles were encountered), as well as in organized outings for the express purpose of harvesting turtles. Additionally, it was also felt that turtles were being hunted more frequently and in greater numbers than in past years, and that some people harvested turtles without regard for open or closed seasons. Furthermore, turtle harvest in some areas was perceived to be high enough to cause overharvest and to worsen the rate of decline of certain turtle populations. General comments were compiled from the answers given during group discussions, some of which provided particular insights in relation to management issues. Stakeholders described trends that they believed influence the degree of turtle use and/or how use is impacting tur-

Table 4-6. Perceptions Related to the Value of *Toluk*.

Topic/Issue	Findings	Degree of Consensus
Characteristics for valuation of <i>toluk</i>.	Size (dimensions, weight, thickness). Shape. Color. Natural pattern. Design (craftsmanship). Age. Depth of bowl. History.	High.
Importance of <i>toluk</i> in the role of women in society.	Highly valued. Qualifies and rewards customary women’s work or service.	High.
Monetary exchange value of very valuable <i>toluk</i> pieces.	“greater than \$1000 (USD)”; priceless.	n/a ⁴¹ .
Number of <i>toluk</i> pieces in existence.	Unknown, ever increasing.	n/a.
Contemporary trends in valuation and exchange use of <i>toluk</i>.	Increasing number of less-valuable pieces received for unit of work or obligation.	High.

tle populations. Given diversity of use relative to location, species, and types of uses, summary information presented here should only be regarded as a general description of human interaction with sea turtle populations in Palau (Table 4-7).

4.2.2 Capture/Harvest/Use Rates

These are a reflection of personal turtle use, as well as that of their community or village, and changes in harvest rates or general trends that influence turtle use. This assessment of stakeholder group and individual perceptions does not provide a rigorous quantification of sea turtle use or catch levels in Palau. The evaluation of information does, however, suggest an approximate level of sea turtle harvest, especially for green turtles (Table 6-4⁴²). Estimates of percentages of hawksbill turtle eggs poached in the Rock Islands are presented in Table 6-2⁴³. Other results include suggestions that “serious” turtle fishermen sell most of their catch to buyers in Koror, and that turtle harvest pressure has risen due to increased availability of technology (e.g., fast motorboats). Others provided information relating to the frequency and nature of turtle law violations (Table 4-7).

4.2.3 Appropriateness of Level of Harvest for Sustainability

Given perceived levels of harvest and current condition of turtle stocks, this topic refers to the appropriateness of current harvest levels relative to the perceived status and sustainability of turtle populations. Stakeholder groups’ responses varied widely, ranging from the opinion that current harvest levels do not significantly affect turtle populations, to clear acknowledgements that current turtle harvest levels in Palau were a major factor responsible for the apparent decline of sea turtle populations. After considering direct take impacts and biological characteristics of sea turtles, the large majority of participants acknowledged that harvest levels were likely to be inappropriately high, especially in light of the characteristics and current status of sea turtle populations within the Republic and its surrounding regions (Table 4-7).

4.2.4 Trend in Commercial Sale and Exchange of Turtle Products

Growing commercial use and/or exchange of sea turtle products for other goods may contribute negatively to the maintenance of turtle populations. Individuals identified the growing sale of turtles and

turtle products as a major factor responsible for the increased capture and use of sea turtles in Palau. Many fishermen indicate that the commercial market greatly influences the number of turtles they harvest each year. Many of these same fishermen also indicated that they would rather not hunt sea turtles because they perceived a decline in turtle numbers, which inspired in them a natural concern for conservation. However, the lure to earn easy money by supplying growing commercial demand largely overcame many of their reservations (Table 4-7).

4.2.5 Shipment and Trade in Turtles from the Southwest Islands

Many participants showed concern for an increase in turtle trade, particularly an increase in the number of turtles being transported from the Southwest Islands. There is a prevalent perception that trade in turtles from the Southwest Islands to meet demand in Koror is increasing. Many also see the scale of this trade as unsustainable and damaging to the local turtle populations of the Islands. The majority of participants felt that turtle stocks in the Southwest Islands are more plentiful and healthier than those in the Palau Main Islands, which could be an indication of a potentially decreased catch-per-unit-effort (CPUE) in the Main Palauan Islands (Table 4-7).

4.2.6 Commercialization of Turtle Shell Products

This topic refers to the demand for turtle shell for the manufacturing of *toluk* and other turtle shell products in Palau. Given the constant demand for larger hawksbill shell, Palauan women are willing to pay premium prices for large, high quality turtle shell scutes⁴⁴. Hawksbill decline and the continuous demand for large hawksbill shell to make *toluk* in Palau, has created a situation that causes women to search farther afield to the Southwest Islands and even outside of the Republic of Palau in an effort to acquire large pieces of turtle shell. Not even smaller hawksbill turtles are spared, however, according to respondents' reports of a demand for small scutes and the remnants from larger animals' shells to make turtle shell jewelry meant for commercial sale. Those with knowledge of retail markets generally agree that the commercial sale of hawksbill shell jewelry has increased over the past decade (Table 4-7).

4.2.7 Need for Creation of New *Toluk*

This topic refers to the perceived need to continue making new *toluk* for the purposes of customary exchange. The creation of new *toluk* is a primary driving force in the harvest of hawksbill turtles. Most women consulted indicated that it was not necessary to make new *toluk*, especially since hawksbill turtles were perceived to be declining in number and most new *toluk* being made was small and less valuable than older, larger pieces of *toluk*. Most women shared their perception that the value of recently made *toluk* has decreased over past years. This trend is related to both the decrease in average size of newly manufactured *toluk* and to the changing practice of *toluk* circulation⁴⁵ (Table 4-7).

4.2.8 Sale of Turtle Shell Products to Tourists

This topic refers only to the sale of turtle shell products to tourists in Palau. According to a women's consultation group in Ngerbeched, Palauan women feel that turtle shell jewelry and other hawksbill shell product should not be sold to foreigners because it competes with the use of turtle shell for *toluk*. Others indicated that selling hawksbill shell to consumers "ruins the cultural value of the *toluk*"⁴⁶ (Table 4-7).

4.2.9 General Attitudes Towards Turtle Harvest

Respondents offered various explanations and justifications as rationale for their harvesting practices, highlighting difficulties associated with enforcement and community sentiments. There were fishermen who felt their turtle harvest in no way imperils sea turtle populations in Palau. Some fishermen suggested that they "only take what they need" as their practiced conservation method, without acknowledging the possibility that cumulative individual actions can play a role in the overall decline of sea turtle numbers. Others suggested that those without awareness of the details of sea turtle biology and history, especially young fishermen, may believe that what they observe are actually abundant populations of sea turtles in Palauan waters, and therefore may argue that said turtle populations are healthy and okay to harvest.⁴⁷

4.2.10 From Traditional to Modern: Changing Values and Changing Use

These topics refer to the changing practices and

Table 4-7. Perceptions Relative to Sea Turtle Use.

Topic/Issue		Findings	Degree of Consensus
Turtle Use (general) (4.2.1)	Frequent expressions regarding the use of turtle.	<p>“Turtle is our food.”</p> <p>“We depend on turtle.”</p> <p>“We’d rather depend on turtle than on pig.”</p> <p>“We don’t eat turtle every day.”</p> <p>“We only take what we need.”</p> <p>“We’re not going to waste the turtle we catch.”</p>	n/a.
Capture/harvest/ use rates (4.2.2)	Trend in overall use/ harvest.	<p>Use has increased⁴⁸.</p> <p>Use has remained constant.</p> <p>Use has decreased.</p> <p>Use occurs at high rates during closed season.</p>	Mixed.
	Extent of demand in Koror attracting harvest.	<p>In some villages most harvest of turtle remains.</p> <p>In other villages most harvested turtle goes to Koror.</p>	Mixed.
Level of harvest for sustainability (4.2.3)	Appropriateness of level of harvest for sustainability.	Mixed ⁴⁹ .	Mixed.
	Contribution of commercialization to the depletion of turtle populations.	Growing effect ⁵⁰ .	Mixed.
Trend in commercial sales (4.2.4)		Increasing.	High.
Trade in turtles from the South-west Islands (4.2.5)		Increasing ^{51,52} .	n/a.
Commercialization of hawksbill turtle shell and products (4.2.6)		Increasing ⁵³ .	High.
Need for creation of new <i>toluk</i> (4.2.7)		Unnecessary ⁵⁴ .	High.
Sale of turtle products to tourists (4.2.8)	Preference of women’s groups regarding the sale of turtle shell products to tourists.	Undesirable.	High.

values associated with turtle use. Some participants were concerned about the increasing frequency and scale of government-sponsored events (and private “Customs”) in which turtle meat is served. Participants pointed out conflicts related to government involvement in the harvest of turtles, either by subsidizing transport aboard government-funded vessels such as the national Patrol Boat, or by sponsoring large feasts that include turtle meat. Many identified the loss of traditional authority in regulating turtle harvest and turtle consumption. Still others mentioned that turtles have lost some of their special significance because increased routine harvesting is turning consumption of turtle meat into a common, every-day occurrence. Greed, individualism, a loss of conservation ethic, and a lack of respect for Palau’s future generations, participants felt, were the collective reasons for current unsustainable harvest practices.

4.3 PERCEPTIONS ON SEA TURTLE RESOURCE STATUS

4.3.1 Status of Sea Turtle Resources (General)

The status of sea turtle resources refers to the health and overall condition of sea turtle populations in Palau. Three important indicators of population status were mentioned by participants during these consultations: 1) general trends in turtle density, 2) average individual size of turtles, and 3) nesting frequency. Overall, there is a consistent and widespread consensus of opinion among groups and individuals in Palau that overall, population levels and average individual size of both hawksbill and green sea turtles are low and have been declining for years. The perceived declining condition of Palau’s sea turtle populations is something that for decades has been a concern of Palau’s fishermen⁵⁵, and which is consistent with the general concerns of various experts, agencies, and organizations throughout the region. In short, there is a concern that not only will there be a continued decline, but also that the decline of Palau’s nesting populations will lead to their local extinction (extirpation)⁵⁶. Despite the lack of extensive scientific research, anecdotal information regarding Palauan sea turtle populations strongly supports the perceptions of those who over recent decades have been familiar with the condition of sea turtles populations in Palau⁵⁷ (Table 4-8).

The three primary factors contributing to turtle resource status listed above—abundance, average size,

and nesting frequency—are addressed below in greater detail for both green and hawksbill turtles. Other factors of resource status, including degree of threat, are either treated in this section (*e.g.*, habitat degradation) or in subsequent ones (*e.g.*, turtle use).

4.3.2 Trends in Population Density

This topic refers to changes in the number or abundance of turtles perceived in Palau⁵⁸. There was a strong consensus especially among older fishermen, that the number of green and hawksbill turtles has been decreasing for a number of years. It should be noted that the characteristics of population level and relative turtle size were almost always mentioned together (Table 4-8).

4.3.3 Trends in Average Size of Individual Turtles

The observed average size (referring either to turtle length or weight) of individual turtles, was often regarded by respondents as an indicator of the declining condition of turtle resource stocks in the Republic. It was explained by most respondents that larger turtles in Palau are often targeted for harvest, thus observations of average turtle size can serve as indicators of possible overharvest of targeted individuals and of general changes in turtle population structure. It was uniformly agreed that the average size of turtles has decreased in Palau over recent decades⁵⁹. This observation applies both to green and hawksbill turtles. According to reports of veteran fishermen, sightings of large specimens are becoming increasingly rare with each passing year. Accordingly, participants felt that it has become harder, and that it takes longer, to find the “right size” (*i.e.*, large turtles) to catch than in previous years⁶⁰ (Table 4-8).

4.3.4 Trends in Level of Nesting

The overall number of nests found within the range of nesting beaches used by a given nesting population is an indication of the reproductive output of that population. Nesting density is also an indicator of the relative number of locally nesting reproductive females that remain. While few stakeholder groups and individuals proved to be knowledgeable about the specifics of sea turtle nesting frequencies in Palau, a general consensus was shared that the number of sea

turtle nestings has declined over the years. Hawksbill nesting in the Rock Islands is reported to be in a state of decline by knowledgeable individual respondents, a claim that is supported by previous accounts of nesting levels in the Rock Islands⁶¹ (see Appendix 1). Results of interviews and meetings with Sonsorolese respondents indicate that turtle nesting at Merir, Palau’s largest rookery for green turtles, has been declining for decades⁶². Also in other locations in Palau, green turtle nesting was believed to be either stable or declining. One respondent indicated that green turtle nesting was being re-established in some areas (Table 4-8).

4.3.5 Trends in *Toluk* Size

Trends in *toluk* and its relation to hawksbill populations can be noted by changes in the average size of *toluk* produced relative to its age. The average size of newly made *toluk* plates can serve as a correlate to the relative number of large hawksbill turtles that remain in the wild. Many individuals believe that the availability of large pieces of turtle shell scutes has decreased noticeably to the point that at present time,

these have become difficult to obtain. Hence, the average size of newly made *toluk* has decreased, and so has its value. This condition is indicative not only of the general depletion of Palau’s hawksbill sea turtle populations, but also that fewer sexually mature hawksbills exist⁶³ (Table 4-8).

4.3.6 Other Status Issues

These topics include additional information and commentary related to sea turtle conservation and management. One participant from a group consultation (Sonsorol) reported sightings of green turtles affected by cancers and/or tumors. This condition is suspected to be related to turtle *fibropapilloma* disease. However, according to the rest of the groups consulted, this disease condition was not sighted regularly (Table 4-8).

4.4 EFFECTIVENESS OF CURRENT REGULATIONS/POLICY

To facilitate the assessment of perceptions regarding the effectiveness of current regulations and policy,

Table 4-8. Perceptions Relative to the Status of Sea Turtle Resources.

Topic/Issue		Findings	Degree of Consensus
Status of Turtle Resource (General) (4.3.1)		Low and in a state of decline.	High.
Trends in Population Density. (4.3.2)		Declining and much lower than in the past.	High.
Trends in average size of individual turtles. (4.3.3)		Decreasing.	High.
Trends in levels of nesting. (4.3.4)		Declining, markedly lower than in the past. Applies to both nesting species, green and hawksbill turtles.	High.
Trends in new <i>toluk</i> size. (4.3.5)		New <i>toluk</i> produced is generally smaller; harder to find large turtles.	High.
Other Status Issues (4.3.6)	Presence of disease in turtles.	Existence of tumors in green turtles.	Single stakeholder group, consensus within group.

this topic was categorized into three closely related, but distinct, groupings: effectiveness, compliance, and enforcement of current regulations.

- 1) **Effectiveness of Current Regulations** (Topic/Issue: 4.4.1.–4.4.4.): The overall effectiveness is distinguished from compliance and enforcement in that it is assessed according to the contextual and biological soundness of the approach taken to implement current regulations. Effectiveness, in this case, ultimately relates to the biological sustainability of turtle resources (Table 4-9).
- 2) **Compliance with Current Regulations** (Topic/Issue: 4.4.5.–4.4.7.): The degree to which regulations are adhered to and/or followed (Table 4-10).
- 3) **Enforcement of Current Regulations** (Topic/ Issue: 4.4.8.–4.4.11.): The degree of enforcement effort and its effectiveness in terms of compliance (Table 4-11).

4.4.1 Perception of Effectiveness of Current Regulations (General)

This topic refers to the general performance of modern laws related to sea turtle management⁶⁴. The poor effectiveness of current turtle regulations, especially their enforcement, was a common theme during community consultations and interviews. Respondents expressed that it was clear that existing turtle regulations are highly violated, and therefore, not effective. There were consistent reports of violations and a lack of disincentives associated with them. Some felt this lack of enforcement only exacerbates current regulations' inability to maintain sea turtle populations at self-sustainable levels. Another shared sentiment was that current regulations are in need of revision with respect to the inclusion of stricter limits on take and greater protection of turtles. Because of the complexity involved, the review and findings related to the effectiveness of current regulations are covered in sub-sections. Attention should be given to the fact that after reviewing basic facts related to sea turtle biology (a two-page fact sheet was distributed to all consultation participants), many participants changed their initial opinions regarding what they felt is effective sea turtle regulation (Table 4-9).

4.4.2 Knowledge of Existence of Turtle Regulations or Special Status

This topic refers to the general understanding of national codes regarding restrictions on the take or harvest of sea turtles. Nearly all individuals acknowledged that they were aware of the existence of the Limitations on the Take of Turtles (24 PNCA 1201). However, the majority of these same participants indicated that they were not familiar with the Palau Endangered Species Act (24 PNC 1001-1012). Many participants said that they were familiar with U.S. efforts to regulate turtle use in Palau during the Trust Territory period, and the majority reported that they were aware sea turtles were classified as “Endangered” by other countries or organizations throughout the world (Table 4-9).

4.4.3 Knowledge of Details of National Turtle Regulations

This topic includes details such as the months of closed seasons and the minimum sizes of legally caught turtles. Many participants stated that although they were aware of existing turtle regulations, they were not clear on the specifics of these regulations. In fact, clarification of the specifics of turtle regulations was a common request in most group meetings. In some instances participants gave evidence of erroneous knowledge of current laws and cited, for example, their belief that certain activities were illegal when in reality they are legal under Palau's current sea turtle management framework. Specifically, there appeared to be confusion regarding, 1) the opening and closing of seasons of taking turtles; 2) the size of legally caught turtles; and 3) the legality of exporting of sea turtle products from Palau (Table 4-9).

4.4.4 Effectiveness of the Limitations on the Take of Turtle (as Written)

This topic relates to the appropriateness of the regulations' substantive content, the objectives set for themselves, and the degree to which regulations are enforced. This section addresses the effectiveness and appropriateness of these Limitations, as they are currently written, evaluated according to their biological and/or administrative soundness, and their ability to achieve sustainability goals⁶⁵. Because only the Limitations on the Take of Turtle are currently under imple-

mentation, only this set of regulations is evaluated in this and other sections below.

There were varying opinions of the substantive content of the regulations as they relate to the laws' effectiveness. Some participants commented on their perceptions regarding the soundness of existing regulations and related approaches in terms of how useful and effective they felt they were. Recognizing the biology of turtles in group discussions, the importance restrictions play with regards to nesting turtles and turtle eggs was often acknowledged, as well as how these specific restrictions were beneficial to the maintenance of sea turtle populations. However, it was also mentioned how difficult it is to change or even regulate citizens' behavior within Palau's current regulatory framework and its implementation. Most agreed that additional levels of state regulation would benefit specific sea turtle stocks in various geographic areas of concern.

There were opposing views regarding deficiencies in the current regulations and management regime that were regarded as significant and in need of being addressed. Ineffectiveness associated with existing reg-

ulations was linked to observations that sea turtle populations have continued to decline in recent decades; some were keen to point out that existing regulations allow unlimited harvest during the open season; while others cited biological considerations relative to size⁶⁶; while still others mentioned that current regulations are not effective because they do not address commercial use. Other areas of deficiencies that were identified had to do with perceived problematic loopholes in the approach of current regulations (Table 4-9).

4.4.5 Compliance with Regulations

Compliance in this sense was described to participants as the degree to which turtle rules, codes, laws, edicts, and/or regulations were followed and adhered to. Compliance can be regarded as influenced by components of 1) awareness and public support of existing regulations, and 2) the effectiveness of enforcement (and sanctions) in deterring prohibited activities. Compliance is distinguished from enforcement in this review in that compliance describes the degree of conformity, cooperation, and obedience of

Table 4-9. Perceptions Relative to the Effectiveness of Current Turtle Regulations.

Topic/Issue		Findings	Degree of Consensus
Perception of general effectiveness of current regulations. (4.4.1)	Perception of general effectiveness of current regulations.	Mixed perception of regulation effectiveness.	Mixed.
	General causes of the lack of effectiveness of existing regulations.	Lack of effectiveness is acceptable because of current culture and preferences. Turtle harvest is socially encouraged (turtle is a prized catch and a status item). Enforcement is weak and difficult.	n/a.
Knowledge of existence of special laws or regulations regarding sea turtles or its special status. (4.4.2)		General knowledge was common.	High.
Knowledge of the details of national turtle regulations. (4.4.3)	(e.g., Limitations on the Take of Turtle - 24 PNCA 1201).	Low practical/detailed knowledge.	High.
Effectiveness of regulations (as written). (4.4.4)		Mixed.	Mixed.

citizens with respect to established regulations or laws, whereas enforcement is interpreted as efforts intended to induce compliance with regulations or laws. Clearly and almost uniformly, participants shared their perception that compliance with existing turtle regulations in Palau is low. Examples too numerous to provide showed how fishermen and egg hunters violated existing regulations regularly (Table 4-10).

4.4.6 Violation of Rules by Those with Authority or Status

The violation of rules by those with authority or status was an important dimension that surfaced during consultations. In addition to Palau’s general public violating turtle regulations, it was suggested both often and openly that “People with authority break the rules”. Participants stated their knowledge of certain individuals of authority and/or high status—be they affluent fishermen or government officials—who not only perpetrated violations but even encouraged others to violate turtle regulations as well. Intentional non-compliance of national turtle laws by those of high status or authority was identified as an important management issue not only because the alleged actions are illegal, but also because these offenders (or supporters who aid and abet) set poor examples of

behavior for the rest of Palauan society. This situation, many believed, made compliance lower and effective enforcement more difficult (Table 4-10).

4.4.7 Compliance with National Regulations in Relation to Remote Areas

Based on previous information, it is believed that compliance with national turtle regulations and other rules may be related to the remoteness of each location. A prevalent perception was that regulations do not apply in remote areas to the same degree of strictness as they do in central areas. Reasons for this sentiment were the perception of the increased need for subsistence use of turtles in these areas. Respondents indicated that remote communities tend to follow their own local rules, and that a lack of governance and compliance in remote locations posed significant threats to sea turtle populations in a considerable number of cases (Table 4-10).

4.4.8 Degree of Enforcement of Regulations

This topic relates to the degree to which enforcement activities are pursued and/or are successful in compelling observance of turtle regulations. The degree of effectiveness of existing regulations depends

Table 4-10. Perceptions Relative to Compliance with Current Regulations.

Topic/Issue		Findings	Degree of Consensus
Degree of compliance with regulations (4.4.5)		Low compliance.	High.
Violation of Rules by those with Authority or Status (4.4.6)	Degree to which rules violated by those with authority or status.	High degree.	High.
	Degree to which violations by those with authority or status made compliance lower and enforcement of regulations more difficult.	High degree.	High.
Compliance with National Regulations in relation to Remote Areas (4.4.7)		Pervasive understanding by residents that national regulations do not necessarily apply in remote areas.	Mixed, higher consensus in remote areas.

on the degree to which regulations are enforced. To enforce here is defined as “to compel observance of or the obedience of” regulations. While many identified developing voluntary compliance—through broad-based support, awareness and an understanding of turtle biology and existing regulations—as important, enforcement was regarded by many as a necessary and crucial prerequisite for effective marine turtle management. An overwhelming majority of respondents regarded present levels of enforcement as insufficient and ineffective in Palau (Table 4-11).

4.4.9 Degree of Enforcement Capacity

This topic relates to the resources and ability of enforcement efforts. Stakeholder groups generally concluded that enforcement within the existing management framework (including local village/state level customary practices and regulations) did not occur on the scale, or was not implemented to the degree necessary to deter and prevent violations. Related to this sentiment, it was often suggested in consultations that there were not enough national or state level conservation officers to enforce regulations effectively, considering Palau’s geographical area. Furthermore, court cases pursued by national prosecutors were not handled effectively, or with due diligence, especially in cases that involved persons of influence (Table 4-11).

4.4.10 Enforceability of Regulations

The enforceability of regulations is defined as the

ease with which existing regulations can be enforced. Enforceability of existing regulations was rated poorly due to loopholes and other enforcement-related difficulties. Most commonly offered reasons for deficiencies in enforcement were: large and diverse coverage areas; multiple points of capture, transport, and use; inability to identify nesting turtles once captured; a lack of financial resources; limited enforcement personnel; unwillingness to prosecute high profile cases; and cultural considerations that hinder enforcement (Table 4-11).

4.4.11 Degree of Social Difficulties with Enforcement

Issues regarding social difficulties encountered when attempting to enforce sea turtle regulations often surfaced during group discussions. These discussions included social factors that could influence the effectiveness of enforcement efforts in Palau. Included were problems that had to do with respect/disrespect of authority, selective enforcement, or other contextual factors, such as familial relations. Stakeholder groups often pointed out significant difficulties in enforcing particular statutory regulations in present-day Palauan society. These difficulties were believed to be linked to the social implications resulting from relatively close familial and other social relations. A commonly reached consensus was the perceived difficulty of attempting to enforce turtle regulations when individuals of high status or authority were involved. In very few occasions, participants

Table 4-11. Perceptions Relative to Enforcement of Current Regulations.

Topic/Issue	Findings	Degree of Consensus
Degree of enforcement of regulations. (4.4.8)	Poor, Ineffective.	High.
Degree of enforcement capacity. (4.4.9)	Low.	High.
Enforceability of existing regulations. (4.4.10)	Low enforceability.	High.
Degree of social difficulties with enforcement. (4.4.11)	Social factors greatly increase the difficulty of turtle regulation enforcement.	High.
Other inadequacies with Regulations. (4.4.12)	Critical habitat protection; International Cooperation.	n/a.

mentioned that enforcement officers themselves violated turtle regulations at times, or that government officials were corruptible and/or ineffectual in enforcing the very rules they were entrusted to uphold (Table 4-11).

4.4.12 Other Inadequacies with Regulations

These included aspects and elements that seem of great importance to stakeholders but which they felt were not included or addressed in the drafting of Palau's current sea turtle management regulations. One of the most prevalent of the identified inadequacies was regarded as the failure of existing regulations to address the issue of protection and maintenance of sea turtle habitat. It was felt that better regulations are needed in order to ensure the undisturbed condition of turtle habitat that is required for the recovery and maintenance of Palau's sea turtle populations (Table 4-11).

4.5 VIEWS ON PROPOSED MANAGEMENT ALTERNATIVES

Individuals provided additional opinions regarding management options that had been discussed or presented during group meetings or interviews.

The most commonly suggested modifications to existing management were:

- Nothing; the law is good, but simply needs better enforcement.
- Increase fines.
- Find more money for enforcement.
- Change legal turtle sizes.
- Change season.
- Completely ban hawksbill harvest.
- Prohibit commercial sale.
- Tax Southwest Islands sea turtles enough to make them prohibitively expensive to ship.
- Apply sea turtle mariculture practices ("headstarting").
- Provide more education and awareness.

4.5.1 Change / Update Law

Many respondents recommend updating or changing existing sea turtle regulations. A common suggestion participants made was that modifications be made to Palau's current regulatory framework by

changing present patterns of sea turtle consumption. In group meetings and personal interviews, respondents acknowledged that although they already knew that many fishermen would be reluctant to give up customary fishing practices, they would agree to stricter management regulations to recover populations if they were properly (justly) and uniformly enforced. Many agreed that regulating by size and season as was done previously, has been largely ineffective. Specific responses indicated a need to make laws stricter, and to design management approaches that correspond to knowledge and to new information learned over the past decades about sea turtles. Many suggested that a goal of new modifications should be to allow turtles to "re-populate" and "increase their numbers" (Table 4-12).

4.5.2 No Take - Moratoriums

Permanent "no-take" restriction, more flexible moratoriums, and suspension of harvest, were the most common of the many suggestions on how to improve the recovery and management of Palau's sea turtles. Opinions varied somewhat on the instituting of a nationwide sea turtle moratorium and on how to initiate such a plan. Some suggested that there should be a complete ban on turtle take, while others felt that making exceptions for special occasions and cultural observances would be more acceptable than a complete ban. Many suggested a total ban on the taking of hawksbill turtles while others suggested the same measure for green turtles but with some specific exceptions. Many participants felt some fishermen would be hesitant to give up their customary practices of harvesting turtles (Table 4-12).

4.5.3 Change Size Limit

Directing harvest or protection to particular size classes of individual turtles is one way to manage harvest. Regarding modifications of size limits, participants offered many suggestions (on specifics) and were ultimately divided on what approach to take. Some felt that only larger turtles should be taken so that smaller turtles would not be targeted and thus be allowed to eventually replace larger individuals. Others felt that the exact opposite approach should be followed, that only smaller turtles be taken in order to allow sexually mature individuals to reproduce (Table 4-12).

4.5.4 Change, Reduce or Eliminate Season

Changing or reducing turtle take seasons was thought a means for improving the management of turtles. When contemplating changes to harvest sea-

sons, most groups suggested shortening take seasons in general. Participants did not offer any suggestion related to the establishment of take seasons that were based on turtle biology, although some suggested that studies be done to determine what sea-

Table 4-12. Suggestions and Proposals for Turtle Management Alternatives.

Topic/Issue	Findings	Degree of Consensus
Changes or updates to current laws. (4.5.1)	Highly recommended.	High.
Recommend to change regulations to 'no-take' or moratorium. (4.5.2)	Mixed.	n/a.
Change size limits. (4.5.3)	Some suggest increasing minimum sizes. Others suggest creating maximum sizes.	Mixed.
Change, reduce or eliminate season. (4.5.4)	Most suggested shorter season.	Mixed.
Restrict by method of harvest and/or quota. (4.5.5)	Only few recommended restriction by method or quota, <i>per se</i> . However, many indicated that traditional leaders should be the ones who decide how many and how frequently turtles should be taken.	Mixed.
Restricting take for specific purposes. (4.5.6)	Some groups indicated that using turtles only for specific and very limited purposes would be an improvement in how turtles are managed.	Mixed.
Commercial sale. (4.5.7)	Many groups suggested the elimination of commercial sale of turtles altogether.	High.
Follow customary harvest practices and traditions. (4.5.8)	Most supported the idea that traditional leaders should become more involved in developing approaches for the conservation of turtles, especially deciding when and for what purposes turtles should be harvested locally.	Mixed.
<i>Toluk</i> and hawksbill use. (4.5.9)	Among the women consulted, a large majority supported a complete moratorium on the making of new <i>toluk</i> as a way to reduce harvesting on hawksbill populations.	High.
Government related activities. (4.5.10)	Many felt that government supported or assisted take of turtle was inappropriate and should be discontinued.	High.
Transport of turtles from southwest islands. (4.5.11)	Many suggested prohibiting the transport of turtles from the Southwest Islands.	High.
Better enforcement and more officers and state programs. (4.5.12)	Many agreed that hiring more state law enforcement/conservation officers would improve enforcement of turtle regulations.	High.

sons offer the greatest degree of protection to turtles (Table 4-12).

4.5.5 Restrict by Method of Harvest and/or Quota

Turtle harvest can be restricted by regulating capture methods, as well as by limiting the numbers of turtles that are captured over a certain period of time using a quota that promotes population sustainability. Few participants suggested method restrictions, such as the banning of spearing when taking turtles. A few others suggested limits on the number of turtles harvested (Table 4-12).

4.5.6 Restrict Use for Specific Purposes

Restrictions related to use and purpose were suggested as possible means of effective regulation. Some felt that although a complete closure of “regular” take should be put into effect, that very specific exceptions be made for customary use for certain traditional events, however defined. Some suggested special dispensations for traditional or customary uses (e.g., funerals), while other suggested the same for modern uses, such as inaugurations and other secular events (Table 4-12).

4.5.7 Addressing Commercial Sale

A growing incentive to harvest turtles for the market economy may place greater pressure on sea turtle populations and is contributing to their decline. Many suggested that commercial opportunities to profit from the take of turtle be eliminated entirely. Supporting these suggestions, some indicated that commercial sale of turtle was not (or should not be) as important as traditional use in Palau (Table 4-12).

4.5.8 Allow/Follow Customary Harvest and/or Traditions

An approach to restricting turtle harvest is to allow uses only for specific purposes and functions that follow strictly defined traditional and customary practices. Many respondents supported the customary use of turtles, but there were differences of opinions with regards to defining what “traditional” means, and how to regulate this type of use. Some suggested giving control of turtle use to village chiefs as a way of build-

ing on (albeit weakened yet) still existing traditional cultural values. Others, however, suggested that there needs to be a sharing of responsibility between the traditional chiefs and national regulatory agencies so that use at the discretion of the traditional authorities does not undermine national efforts of sea turtle recovery (Table 4-12).

4.5.9 Prohibit the Making of New *Toluk* and Other Hawksbill Use

Many consultation participants recognized the critical status of hawksbill turtles in Palau and that the continual creation of new *toluk* can be directly linked to this condition. Some respondents, including a large majority of women, suggested a halt to the creation of new *toluk*, the making of jewelry for commercial sale, and the harvesting of hawksbill turtles. Some suggested an indefinite moratorium, not to be lifted unless turtle populations improve (Table 4-12).

4.5.10 Addressing Government Related Activities

Discussion of government related activities associated with turtle take included 1) government supported events and feasts, 2) transport of turtles on government-owned vessels, and 3) indirect subsidizing of turtle transport. In most cases, many felt that government activities related to turtles, including government supported feasts and government subsidized turtle transport, whether through the national Patrol Boat or nationally-funded supply vessels, were inappropriate activities undertaken by the government and that they should be discontinued (Table 4-12).

4.5.11 Curtailing Turtle Transport from Southwest Islands

Transport of turtles from the Southwest Islands of Palau was often cited as a growing threat to local populations. Many respondents, including many Southwest Islanders, indicated that they believed the common practice of transporting turtles from the Southwest Islands to Koror, often for commercial purposes, was an unsustainable and inappropriate practice. Many suggested curtailing the harvesting and transport of turtles from the Southwest Islands in order to stem the resulting commercial turtle trade in Palau. Some

indicated that locally caught turtles in the Southwest Islands should only be used for local consumption and not use outside of these islands (Table 4-12).

4.5.12 Improving Enforcement through More Officers and State Programs

Better enforcement refers to a higher degree and higher quality of enforcement. One component of this topic often mentioned in consultations was the number and range of law enforcement and conservation officers, as well as the existence of state enforcement programs. There was a clear and strong consensus to strengthen the enforcement of turtle-related legislation, new or existing, regarding harvest and use—especially through the development of state law enforcement programs. Many suggested hiring more conservation officers in each state; others suggested giving these same officers greater authority to enforce laws. The integrity of high state officials was questioned by a few who cited corruption and nepotism at the state level as possible interference with desired enforcement goals. Some recognized the need for stronger national government coordination and regulatory oversight, especially in certain situations in which social implications make state-level enforcement difficult (Table 4-12).

4.5.13 Increase Sanctions: Fines and Imprisonment

Many feel that there currently are not enough disincentives to discourage people from violating sea turtle harvesting restrictions. A common suggestion was to increase fine amounts and/or to implement more severe jail terms that can deter would-be violators while raising the profile of sanctions. Some mentioned raising fines to an amount well above what is considered commensurate with the price paid for turtles on the existing commercial market. One person suggested the need for government not to appear too heavy-handed in its sanctions against turtle violators. Others indicated that it should be primarily traditional authority figures who levy fines on violators (Table 4-13).

4.5.14 Prevent Abuses of Power

How to address abuses of power related to turtle regulation violations was a subject of discussion in

many groups. Preventing abuses of power and authority was seen by some participants as one of the most effective and influential ways to begin improvements in enforcement and management. Suggestions were more self-policing, stricter sanctions for any and all violators, and checks and balances within a regulatory framework. Some also suggested that more support and leadership from the national government could help address these issues (Table 4-13).

4.5.15 Protect Critical Habitat Nesting Areas

The need for protection of critical habitat was often noted during group consultations. Some groups suggested that areas of high nesting density should be afforded better protection against human disturbance (*e.g.*, such as egg poaching) as well as safeguards against the modification of nesting beaches (*e.g.*, development, beach clearing, intensive cleaning). Others suggested that nests be protected against natural or non-indigenous human predators (Table 4-13).

4.5.16 Promote Conservation Action

Conservation action was defined as any action or set of actions taken to promote the conservation and management of turtle populations. One participant suggested covering the tracks to and from newly laid nests as an easy and effective way to deter the poaching of turtle eggs. The erasing of turtle tracks, it was suggested, could be done by conservation officers and/or by any others who visit nesting beaches regularly (Table 4-13).

4.5.17 Improve Turtle Education and Awareness

Education and awareness include programs that support management initiatives. Many suggested that education was a key factor to help manage and conserve sea turtles. Sharing information about biological uniqueness of turtles was viewed as a crucial way to gain public support for recovery efforts and increased regulatory enforcement. Others suggested that the best way to learn proper behavior is by example, and that authority figures should provide stronger guidance for conservation and management. Outreach and awareness programs that promote sharing of ideas were seen as essential and not to be neglected. Participants felt that special attention should be given to the way in which information on sea turtle conser-

Table 4-13. Suggestions and Proposals for Management Alternatives (Continued).

Topic/Issue		Findings	Degree of Consensus
Sanctions for violators' fines and imprisonment. (4.5.13)		Many suggested raising the fines for violation of turtle regulations, as well as increasing the number of violators imprisoned, as a means to provide stronger deterrence.	High.
Preventing abuses of power. (4.5.14)		More stringent and consistent enforcement of the law should be applied to deter abuses of power. Some suggested better national oversight in cases of violations at the state level.	High.
Protecting critical habitat. (4.5.15)		Some suggested the protection of areas of high nesting density from all forms of human disturbance.	High.
Erasing nesting tracks. (4.5.16)		An easy and important conservation activity to decrease egg poaching from nesting beaches.	n/a.
Improve turtle education and awareness. (4.5.17)	Education and awareness.	Increased education and sharing of information was thought by many to be key to conservation efforts. Directed and sustained outreach and awareness programs needed to occur, suggested many, in order to effect necessary change in prevailing attitudes.	High.
	Education and younger generations.	It was suggested that because taste habits and attitudes towards the eating of turtle were not as well developed in children as in their adult counterparts, that conservation and awareness efforts would be more effective if aimed at Palau's younger generations.	High.
Leadership, coordination, and planning. (4.5.18)		Many indicated the need for good planning, effective leadership, and greater support in the facilitation of conservation programs.	Mixed ideas, all indicated support for the issues.
National and international cooperation. (4.5.19)		Some identified the benefit of national and state management efforts to be harmonious and supportive of each other. Few indicated that Palau should join international efforts and programs and implement strategies with other countries to address shared resource issues.	Mixed.
Information and monitoring. (4.5.20)		Groups identified monitoring as important, but indicated that capacity and/or motivation to undertake monitoring was often lacking. Some suggested the creation of a centralized monitoring system for the coordination of information on Palauan sea turtles.	Mixed.

vation is shared with Palauan audiences in order to ensure the best opportunity to modify complacent attitudes. Some suggested various forms of information exchange and media uses to promote conservation messages in an effort to safeguard sea turtles (*e.g.*, annual women’s groups meetings and radio forums). The importance of educating the youth was clearly emphasized, together with a need to be more innovative with respect to turtle conservation awareness and to sustain conservation and education programs over the long term (Table 4-13).

4.5.18 Emphasize Leadership, Planning, and Coordination

Because of the multi-sector nature of turtle management, consideration was given to leadership, coordination, and planning. Many indicated that turtle conservation initiatives in Palau need more facilitation and mindful, focused planning in order to be successful, and that true coordination and cooperation among groups and agencies was not common enough. Stronger leadership that could develop multi-group solutions to obstacles was deemed crucial. Participants identified goal and activity planning for supporting programs as an important concern, while others pointed out that there was a need for evaluating the effectiveness of current and future conservation programs. Participants suggested that workshops be held in order to develop conservation strategies, plans, and proposals (Table 4-13).

4.5.19 Encourage National and International Cooperation

National cooperation relates to national and state interaction. International cooperation can include participation in international and/or regional programs aimed at enhancing the management of shared sea turtle resources across international boundaries. Many suggested the need to coordinate national and state management and conservation activities so that programs are more comprehensive, have greater reach, do not undermine each other, and are generally more effective. Some suggested the need for wider international coordination and participation between Palau and other resource-sharing countries (Table 4-13).

4.5.20 Information and Monitoring

Information and Monitoring relates to specific information on the biology or status of Palauan sea turtles and on the tracking of changes related to sea turtle resources over time. Most suggestions on monitoring related to “what we have, how much is being taken, and what is being affected.” The importance of sharing information with citizens in an effort to gain their support and increase their understanding was often a point raised during these consultations. Training in monitoring skills and being part of larger monitoring efforts were identified as necessary strategies for sustaining monitoring activities. Some suggested the need for the establishment of a centralized monitoring center for collection and management of information related specifically to sea turtle populations of Palau (Table 4-13).

5 DOCUMENTATION OF CURRENT INFORMATION ON NESTING ACTIVITY

A compilation of documented turtle nesting activity in Palau between the years 1992 and 2001 is presented in Table 5-1. Written records or other forms of documentation on turtle nesting activity—housed in national government resource agencies, state or local conservation and management offices, and local non-government organizations—remain sparse. It is crucially important to note that these records represent

only a fraction of actual sea turtle nesting and were recorded using varying degrees of monitoring effort over different time periods (as indicated in the table). Thus, caution should be exercised when interpreting the presented data. (See Appendix 5 for a list of agencies and organizations consulted for records and additional information.)

Table 5-1. Documented Sea Turtle Nesting Activity (1992–2001) of *Chelonia mydas* (C.m.) and *Eretmochelys imbricata* (E.i.) within the Republic of Palau.

Geographic Area / State / Island / Nesting Beach	Source	Nesting Numbers / (Date/Monitoring Effort*)	Threats/ Geologic Changes
Palau-wide Summary	Maragos 1992.	n/a	Various, see text.
Southwest Islands			
Sonsorol State			
Merir Island	Geermans 1992.	29 <i>C.m.</i> nestings recorded over June 9–12, 1992.	Poaching of eggs and nesting turtles.
Hatohobei State			
Hatohobei Island	Geermans 1992.	1 <i>C.m.</i> nesting, one day visit, June 8, 1992.	Poaching of eggs and nesting turtles.
	Matthews, M. pers. com. to M. Guilbeaux 1995.	1 confirmed <i>E.i.</i> nesting on Hatohobei, 1995.	
Helen Island	Geermans 1992.	1 <i>C.m.</i> nesting, June 5, 1992.	Foreign poaching of turtles and eggs; local consumption of turtles and eggs, rats.
	Weng and Guilbeaux 1999.	11 <i>C.m.</i> recent nestings, one day survey, Aug 10 th , 1999.	
	Birkeland <i>et al.</i> in prep.	14 <i>C.m.</i> nestings	
	Helen Reef Monitoring Program, Hatohobei State Government, 2001.	21 recent <i>C.m.</i> tracks recorded during one-day visit, June 2001.	
Palau Main Islands			
Koror State			
Ngerukewid Group	Madriasau 1992.	3 nests, presumably <i>E.i.</i>	Poaching of turtles and eggs by humans, and threats of predation of turtles and eggs by dogs (and predation of eggs by rats in some locations). In places where campfires are made, possibility of nesting disruption.
	Atkinson and Guilbeaux 1992.	2 nests, presumably <i>E.i.</i>	
	Guilbeaux, Davis, and Tonne 1994.	13 nests, presumably <i>E.i.</i>	
Kmekumer Group	Madriasau 1992.	2 nests, presumably <i>E.i.</i>	
	Atkinson and Guilbeaux 1992.	6 nests, presumably <i>E.i.</i>	
	Guilbeaux, Davis, and Tonne 1994.	6 nests, presumably <i>E.i.</i>	
Omekang Group (including Lyuuch)	Madriasau 1992.	2 nests, presumably <i>E.i.</i>	
	Atkinson and Guilbeaux 1992.	4 nests, presumably <i>E.i.</i>	
Ngkesiil	Madriasau 1992.	4 nests, presumably <i>E.i.</i>	
	Atkinson and Guilbeaux 1992.	1 nest, presumably <i>E.i.</i>	
Ngerbedangel	Madriasau 1992.	3 nests, presumably <i>E.i.</i>	
Nigurgomel	Madriasau 1992.	3 nests, presumably <i>E.i.</i>	
Ulong Island	Geermans n.d. (1993)	3 nests, presumably <i>E.i.</i>	
Bibuul	Records of Guilbeaux, 1995	2 confirmed <i>E.i.</i> nestings	
Eastern Rock Island Beaches, including Ngermediu Beach	Records from the Koror State Marine Enforcement and Conservation Program (1995).	3 nestings, presumably <i>E.i.</i> , recorded in 1995 ⁶⁷ .	
Airai State			
Ngerduais Beach	Geermans n.d. (1993)	1 nesting, presumably <i>E.i.</i>	Unknown.
Melekok State			
Ochiberames	Julita Tellei, pers. comm., 1995	Some nesting reports, unrecorded, assumed to be <i>C.m.</i>	Street and house lighting appear to be a threat; reports of turtle disorientation.
Angaur State			
Angaur Island Beaches	Guilbeaux 1992.	2 <i>C.m.</i> nestings; 1 confirmed <i>E.i.</i> nesting	Poaching of turtles and eggs.
Kayangel State			
Kayangel Atoll Islets	Guilbeaux 1992.	2 <i>C.m.</i> nestings and eggs.	Poaching of nesting turtles.
Ngeruangel Island	Guilbeaux 1998.	1 <i>C.m.</i> nesting predation on hatchlings.	High level of Hermit crabs.
Reference: Madriasau 1992. Atkinson and Guilbeaux 1992. Guilbeaux 1992. Geermans n.d. (1993) Guilbeaux, Davis, and Tonne 1994. Guilbeaux 1998. Birkeland et al. 2001.	*Additional Date/Monitoring Effort Information: Nests recorded Jan.–May 1992 during periodic daytime beach surveys by boat. Nestings recorded during 25 patrol days/nights Jun. 16–Jul. 28, 1992. Nestings reported during one day beach surveys, Oct, 1992. Nestings reported during one day beach surveys, Aug 1992. Nestings recorded over 46 patrol days/nights during Feb. 1–Mar. 24, 1994. Nestings recorded during one-night visit July, 1998. Nestings recorded over 8 days, Sept 24–May 2, 2001.		

6 SUMMARY OF CURRENT CONDITIONS, POLICY AND EXISTING MANAGEMENT FRAMEWORK, AND RECOMMENDATIONS

6.1 COMMENTARY ON EXISTING CONDITIONS

6.1.1 Current Status and Outlook

The status of Palau’s sea turtles is marginal at best⁶⁸. If current trends hold any predictive value, nesting reduction and current conditions of threats do not bode well for the continued maintenance of local sea turtle populations. Despite laws in Palau that offer partial protection to sea turtles, populations have continued to decline. Palau has been fortunate to have abundant sea turtle stocks survive over the past centuries—such as the Rock Island hawksbill population and the Merir Island green turtle population, long thought to be the most abundant nesting colonies of their kind in all of Micronesia (NMFS and USFWS 1998a, 1998b). While these Palau nesting populations may still be significant relative to current populations in Micronesia, it is believed that populations in this region have declined precipitously, amounting at present to a mere fraction of what they were in the relative near past. Both green

and hawksbill turtle populations in Palau, based on current trends and threats, appear to be in danger of local extinction (NMFS and USFWS 1998a, 1998b).

There are multiple causes for the recent regional decline in turtle populations. A majority of these reasons are believed to be directly related to the turtles’ biological and reproductive constraints, combined with the growing scale of adverse impacts affecting sea turtles populations. It has been learned over the past thirty years throughout the world that sea turtles are highly susceptible to human-related activities. Because marine turtles naturally experience very high levels of mortality during early life stages, and because they have long maturation periods⁶⁹, their populations grow at naturally slow rates, in proportions difficult for most people to imagine. The inadequately controlled, unsustainable harvest of turtle eggs, juveniles, and sexually mature adults decreases not only population numbers, but also reduces the possibility that affected populations may be able to replenish themselves. In many locations throughout the Pacific and

Table 6-1. Locations Where Direct Harvest of Turtles and/or Eggs Is Believed to Have Significantly Reduced or Effectively Eliminated Nesting Populations⁷⁰.

Location	Species
West Fayu, Federated States of Micronesia (FSM)	Green
Pikelot, FSM	Green
Satawal, FSM	Hawksbill
Christmas Island, Kiribati	Green
Eliapata, Upolu Island, Western Samoa	Hawksbill
Rose Atoll, American Samoa	Green
Bonin Island, Japan	Green
Terengannu, Malaysia (egg collection)	Leatherback
Sarawak, Malaysia (egg collection)	Green
Berau Island, East Borneo (egg collection)	Green
Ras Sharmah, Yemen	Green
Bali, Indonesia	Green

elsewhere in the world, sea turtle nesting populations have diminished or become locally extinct (Table 6-1). And while it is possible that human consumption of turtles and a sustained turtle population use can co-exist, this can only be the case if turtle harvesting is carefully regulated (Colin Limpus, personal communication).

Palauans who know about turtle migrations realize that direct harvest or other human related impacts in Palau are not the only adverse effects on sea turtle populations⁷¹. Nevertheless, the impact of local harvest does appear to be one of the most significant factors responsible for the decline of sea turtle populations in Palau, as well as presenting serious impediments to local population recovery and long-term stability. Participants agreed unanimously about declining stocks, fewer sightings of large sea turtles, and decreased nesting. Local resource managers, veteran fishermen, and sea turtle specialists have for years shared similar opinions of declining stocks prior to this study. Scientific information regarding sea turtle populations within the Republic of Palau lacks completeness, yet in no way offers any contrary evidence to the perceived conditions that can be inferred from these consultations. Participants also reported sustained and growing threats, such as increased harvest rates and increased harvest efficiency.

Current evidence indicates that Palau's sea turtle resources have been managed without enough regulation and that existing controls are inadequate to effectively maintain local sea turtle populations. Present enforcement and management controls appear incapable of ensuring overall compliance of existing regulations, or effectively sustaining populations over time. While there certainly is room for improvement in enforcement, the prevailing statutes (the Limitations) appear to have a number of inherent flaws that prevent existing management strategies from being effectively applied. Not only has there been a failure to adapt management to new biological information regarding the sensitivity of turtle populations, but there has been a failure to address changing threats within the Republic. Consultation results indicate that insufficient controls and legal loopholes within the existing regulatory framework confound effective management and enforcement. For example, the most, if not one of the most, severe threat to sea turtle populations in Palau—the direct harvest of turtles—is currently allowable (over certain minimum sizes) at unlimited levels during seven (7) months each year.

While it would be of great benefit to curb turtle egg poaching, nesting habitat encroachment, pollution, and other threats, nothing could possibly be as effective in preventing the decline of Palau's sea turtles populations as addressing the threat of (legal and illegal) direct take of adult turtles under Palau's current regulations. It has been recommended in several instances (see Appendix 2) that the existing regulations be modified, or abandoned completely, in order to lay a realistic foundation for a more comprehensive management strategy that would effectively address known threats and reverse current worsening conditions.

Members of the national and international resource management community, as well as many members of Palau's general public, have recognized the critical role turtle-take plays in reducing Palau's sea turtle populations. Yet, it seems that during the past decade, every time initiatives have been taken to pass stricter regulations on turtle-take, all efforts to improve current conditions of management have been effectively thwarted by pro-turtle utilization lobbies. It would appear that these interest groups fear changes in existing policy and/or conservation laws that could mean a complete end to traditional and customary practices, primarily the regular consumption of sea turtle meat. The end result of this opposition is that no modifications to the existing regulatory framework have been possible in spite of numerous efforts spanning nearly a decade. Enforcement of natural resource laws has remained a low priority in terms of enabling enforcement agencies with sufficient resources and also in terms of prosecuting key cases. Apparently, Palau's existing legal system is reluctant to exercise its power in the prosecution of known key cases in which transgressions have been documented due to the fact that the transgressors are influential in Palauan society. A growing trend in commercialization of turtle meat and shell products has become increasingly evident over the years, along with a concurrent, steady decline in turtle numbers and sizes. Despite a decade of repeated attempts to pass new national legislation to improve the management of marine resources and endangered species, the issue of sea turtle conservation has often been kept at the margins of discussion—as a topic too complicated or too controversial for decision makers in the public eye to contend with. This condition has regularly led to the omission or termination of discussion of the entire subject of sea turtle management, forestalling progress towards more effective sea turtle policy and

management. Confounding the issue, some proposed legislative instruments related to sea turtles appear to attempt to weaken existing regulatory statutes.

While resource managers are aware of increasing resource depletion, some have felt they lack the type of scientifically rigorous information typically deemed necessary in making a convincing enough case for the need for changes in policy (*e.g.*, long-term population trend data, minimum viable population level estimates, sustainable harvest estimates). Resource managers and decision makers have had indications from fishermen, scientists, and even family members that for quite some time local sea turtle populations have been declining and are “in trouble”. However, without access to extensive financial and scientific resources, it is unlikely that Palau’s decision makers will ever have, in the foreseeable future, enough locally collected scientific information to justify making decisions about changes in turtle management policy based on conclusive evidence and traditional scientific standards. Resource managers and policy makers in Palau lack scientifically-based information on 1) historical trends of local turtle populations, 2) local vs. non-local breeding (foraging) stocks, 3) current population levels, 4) reproduction levels, 5) migration patterns, and 6) adequate management targets and recovery goals. Frequently asked—“*How many turtles do we have in Palau?*”; “*What are normal or healthy population levels for Palau?*”; “*How many turtles can we harvest without damaging our resources?*”—are questions at present largely unanswerable by managers, fishermen, and specialists alike to a sufficiently confident degree. Confirmed anecdotal information indicates that at sites across Palau reproduction and nesting have decreased, and that it is likely that the majority of Palau’s turtles are being harvested before they reproduce sufficiently to maintain sustainable populations. Moreover, decades of information from all over the world make clear the basic precepts that sea turtles are sensitive species, requiring both global and regional management, and that there is an obvious link between turtle population decline and negative impacts arising from human activity.

While it is clear from the above that existing scientific information regarding Palau’s sea turtles is not, or even close to, optimum in its breadth and time-span, there certainly exists enough consistent evidence, combined with elemental contemporary knowledge of sea turtle biology, to justify without further delay improvement in management of turtle populations.

Guidance from expert sources (see Principles below and Appendix 2) can assist Palau in developing a more effective policy for managing its sea turtles. For example, a team of Pacific resource managers and sea turtle experts recently gathered to develop a set of conditions (modified and included as Model Recovery Standards, Appendix 8) that would indicate the recovery and self-sustainability of sea turtle populations⁷². While modifications to fit Palau’s particular circumstances would have to be made, this set of guidelines outlines specific recommendations that if followed and implemented would significantly reduce current negative human-related activities which threaten Palau’s sea turtle populations. This same group provided advice for future management policy and action for Pacific Island States, including the Republic of Palau. It is uncertain how Palau as a nation will respond to these and other recommendations to enhance sea turtle management, as some would require significant modification of existing human behavior, a higher degree of enforcement, and that resources be dedicated to long-term management. However, as one manager pointed out, “The longer we wait to do something in relation to turtles, the harder it will be for us to succeed.”

Despite compelling information that sea turtle conditions in Palau need to be changed, modifying contemporary behavior is expected to be difficult. Effective sea turtle management has proved to be challenging in areas of the insular Pacific (World Bank 1999). It is reasonable to anticipate that enhancing recovery and conservation in Palau will be no less of a challenge. Efforts to increase restrictions on turtles will be met by obstacles of long historical use, a stream of benefits (nutritional, economic, and social) associated with the purveyance of turtle, and low standards of compliance and enforcement. Further descriptions of these difficulties follow.

Sea turtles have long been used as food and materials in Palauan and Southwest Island traditional societies. While it is uncertain to what scale sea turtles were used in the periods prior to Western and other foreign entity contact, it is believed that the use of sea turtles during this time was heavily regulated through a strict system of customary marine tenure practices upheld by traditional chiefs (see Johannes 1986; McCoy 1974). Over the past century, turtle conservation restrictions based on traditional ethics have slowly eroded due to the socially disruptive effects of colonialism, democratic and religious conversion, and the

overall promotion of Western values. The overall effect, with respect to sea turtle populations in particular and marine resources in general, has been a general reduction of *de facto* (actual) regulation. Although evidence indicates that national agencies have made earnest attempts to uphold the regulations inscribed in Palau's National Code (Owen 1977, 1978), modern centralized government has shown to be only modestly successful in achieving the same degree of acceptance and compliance as is attributed to forms of traditional governance in Palau (Johannes 1981; Graham 1998). This appears to be especially true with respect to the management of sea turtles. Recent technological advances have made turtle hunting much easier and efficient, and have expanded the range and reach of turtle hunters. The combined result of these abovementioned changes has been 1) that turtles and their eggs have become easier prey, and 2) that sea turtle management and compliance have become comparably lax relative to earlier times.

It is for these and other reasons that Palau's resource managers, decision makers, and citizens wishing to improve the chances of recovery of sea turtle populations face serious challenges. The greatest challenges will be changing deeply-rooted human behaviors, and increasing regulatory control over sea turtle use in Palau. Turtles are a highly relished and favored consumable from the sea. While other sources of nourishment and nutrition abound in Palau, turtle meat is distinguished as socially and culturally significant, an almost irreplaceable resource. Those who enjoy the benefits of turtle would gravely regret it if it suddenly were no longer available. Basic nutrition, commercial value, social practices, personal preferences—all of these attributes make turtles an unparalleled resource. Regrettably, this significance causes turtles to be hunted incessantly, during open and closed season. Fishermen regard sea turtles as opportunities that should not be passed, and chase turtles whenever they are seen. Turtles are not merely caught for single-household use, but also for extended family functions, or to be sold to those desiring turtle meat or shell, as well as to markets and restaurants. Turtle meat is also often a key dish prepared for "Customs" and other important social events, although not necessarily required. When used in fishermen's households, turtle is a relatively inexpensive meat that reduces dependence on store stocked foods and other sources of protein, such as pork, beef, and poultry. This preference is not due to mere habit. From a prac-

tical point of view, under current conditions it is easier and quicker to hunt for turtles than to keep and raise a similarly sized livestock (*e.g.*, pig). Furthermore, many fishermen and businesses have come to rely on income generated from the sale of turtle, a trend that, without enhanced regulation, is only likely to increase.

In addition to the above reasons, social aspects and functional uses of turtle present a major challenge to improved recovery and management of Palau's turtles. The consumption of turtle meat is a link to traditional culture in Palau⁷³. Associated with sea turtles is a host of values and social benefits that range from prestige to basic sport and enjoyment. Turtle meat is endowed with subjective characteristics that make it a significant and quite often a favored part of contemporary Palauan diet. Among these particular attributes are taste, nutrition, size, and the fact that turtle meat bestows status and honor to hosts and guests alike during special social functions. Turtle can be used to welcome guests—as is frequently done in Babeldaob and in Southwest Island villages—or to feed large groups of people due to the large amount of turtle meat an adult sea turtle can provide. And since serving turtle increases the significance of events and can be used to honor special people, turtle is often procured or requested for public and private events, such as during Palau's officially observed holidays and private celebrations. The presence and the quantity of turtle meat offered to guests add a sense of prestige and tradition to customary events. Turtle meat can also be used as a means to grant honor to special guests, especially when social status demands it. This is particularly true for inaugurations, funerals, and other similarly important events.

The exchange and sale of turtle meat provides a means for the building and strengthening of social ties via the customary practice of distribution of harvested resources. Furthermore, there are additional levels of social significance associated with the hunting of turtle. The capture of a large turtle is regarded as a difficult and manly task and hence an event that bestows status to the capturer as a provider and a leader. The hunting of turtle also provides the opportunity for fun, excitement, and camaraderie for all involved, even bystanders. In some locations it is mentioned that turtle is often hunted for sport by young men, after which economic dividends are distributed⁷⁴. Lastly, turtle eggs of both hawksbills and green sea turtles are chronically sought as delicacies, a practice

that continually reduces the reproductive output of populations already stressed by a long history of the direct take of older, reproductive adults. Culinary appreciation for both turtle and turtle eggs is strong and therefore a tough impediment to conservation and management. Palauans and Southwest Islanders alike, especially the older generations, have grown up being accustomed to these tastes and often feel that turtle is “just too tempting to resist.”

Another important cultural use of the hawksbill turtle is the exchange of *toluk* shell money among Palauan women. This uniquely Palauan traditional use of turtle shell is a key element of social relations among women and clans. Knowing that the largest scutes of hawksbill’s shell can be sold to eager buyers who will convert shells into *toluk*, fishermen rarely pass up the opportunity to capture valuable large adult hawksbill turtles. Smaller hawksbill turtles—those with scutes not large enough for the making of optimal-sized *toluk*—are nevertheless harvested because their thinner shells can easily be sold to craftsmen who turn a profitable business in supplying turtle shell jewelry to gift shops that feed and fuel growing tourist demand. Store managers have found that selling turtle shell jewelry to tourists (a legal practice in Palau) is lucrative, and in some cases, these managers may even advise tourists how to smuggle turtle shell jewelry past customs officials in their home country (Store Manager, Koror, Palau, personal communication, May 2001). Palauan women who exchange *toluk* have witnessed a steady decline in *toluk* thickness and size (and hence *toluk* value) of newly made pieces—a clear indication that adult hawksbills are becoming increasingly scarce.

Effective enforcement of current turtle regulations through Palau’s existing management framework appears exceedingly difficult. Reversing turtle population depletion through current regulations seems unlikely unless significant changes in policy and the current management framework are made. It is highly unlikely that current abuses will be stopped or even be hindered unless the penalties for the violation of existing laws are increased. Furthermore, even if penalties were increased, without sufficient enforcement, perpetrators will continue to violate laws without fear of getting caught; for it is unreasonable to expect that Palau’s current handful of enforcement agents can effectively monitor the harvesting activities of an entire nation. Patrolling five hundred and sixty (560) square miles of near-shore coastal waters, numerous

remote nesting beaches, over 19,000 residents, and nearly a thousand registered powerboats (Graham 2000a), presents a formidable task even under the most optimum of conditions.

During consultations many concerned citizens cited the need for more and better enforcement at the national and state levels. However, resources for increasing (national or state) enforcement are not often available, reducing the priority assigned to these important programs (with the notable exception of the Koror State law enforcement program). Moreover, fines for violations appear to be inadequately low (due to the disparity between the fine amounts vs. the economic benefits that can be gained by risking said fines) to deter illegal harvesters. Enforcement and prosecution efforts are sometimes confounded when instances of social relations or influential people are involved. In the words of a participant, “it is difficult to bite the hand that feeds oneself.” In cases when violations occur under the auspices of government functions, such as when turtle meat is served during a time of the year when turtle take is illegal⁷⁵, many Palauan citizens feel that public officials make a mockery of the law. This situation, in turn, contributes to the difficulties experienced with respect to enforcement and compliance.

However, attempts to improve enforcement effectiveness are taking place. Citizen education and outreach with respect to natural resource regulation and enforcement are being conducted by national agencies, and more citations and cases against turtle violators have been filed. In the past two years, the Division of Conservation has issued an estimated thirty (30) citations for turtle-related violations and has filed approximately ten (10) cases with the courts for prosecution⁷⁶. In some locations, traditional leaders in coordination with state governments have established various marine protected areas by utilizing customary forms of resource control (such as *bul* closures) that have, in these select areas, effectively enhanced sea turtle protection and management. However, not all local leaders enjoy the type of broad support needed to establish similar resource protection initiatives in their communities where human behavior is known to be harmful to sea turtles populations. Some of these leaders, although they would like to improve conditions in their respective communities, feel powerless to effect change when faced with the effects of the erosion of traditional authority and other trends.

6.1.2 Species Specific Status

To better understand and appreciate the status and overall condition of turtles in Palau, an understanding of the scope and range of threats faced by turtle populations is critical. Below is a model representing major local and foreign-based threats to sea turtle populations of Palau (Figure 6-1). This diagram indicates the possibility that there may be separate populations (or distinct groups) of the same turtle species that occur within Palau’s waters. Individual turtles of some of these populations are born in Palau, forage in other distant areas, and migrate back to Palau to reproduce (“Palau Nesting Populations”); while individual turtles from other populations are born and reproduce in distant areas, and migrate to Palau only to forage (“Multiple Distinct Populations Foraging in Palau”). The consideration that distinct populations of the same sea turtle species may exist in Palau is a rather new concept; one which has special management implications in terms of addressing the needs for Palau’s

remaining turtle populations. This information should be shared with those in Palau responsible for or concerned about sea turtle recovery and management. Policy changes, directed both nationally and regionally, should be made accordingly⁷⁷.

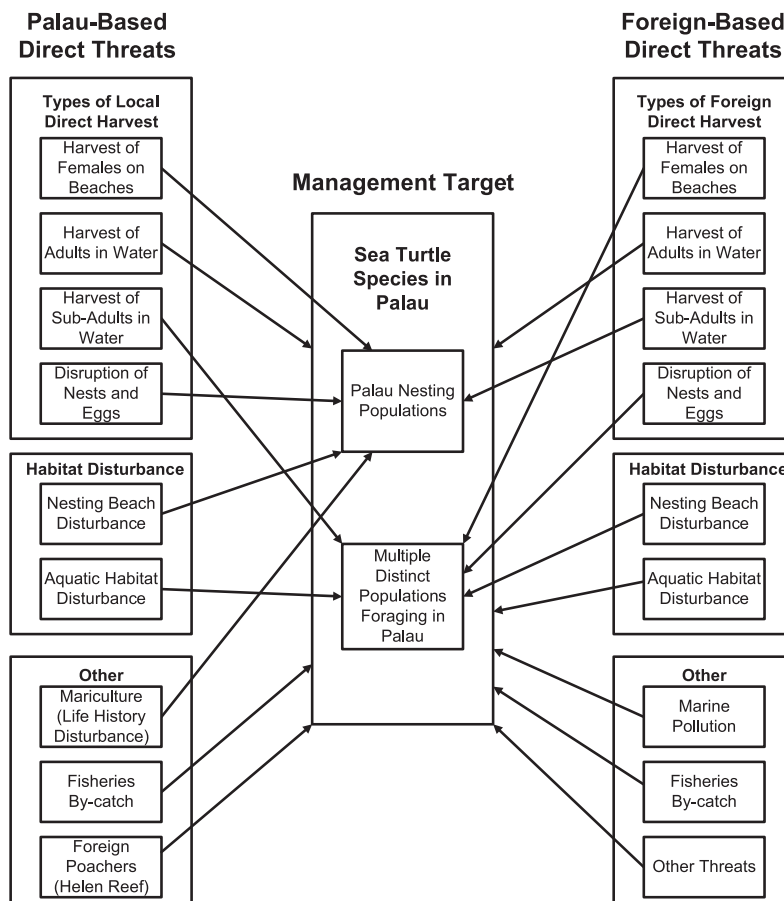
6.1.2.1.1 Hawksbill Turtle - Ngasech (*Eretmochelys imbricata*)

Condition of Nesting Hawksbill Turtle Populations

Current estimates point to as few as twenty (20) hawksbills nesting each year in Palau (fifty to sixty [50–60]) under the most favorable conditions (NMFS and USFWS 1998a). Eggs laid in the Rock Islands are estimated to be poached at high levels (enforced protected areas are believed to reduce risks of poaching). Greater availability of motorboats promotes increased human activity on hawksbill nesting beaches in the Rock Islands, a condition linked to increased vulnerability of nesting turtles and their eggs.

Nesting hawksbill turtle populations in Palau ap-

Figure 6-1. Conceptualization of Major Local and Foreign-based Direct Threats to Sea Turtles in Palau.



pear to be threatened to critical levels. Considered to be the largest nesting hawksbill population in Micronesia, the Rock Island hawksbill turtle rookery is believed to have sustained considerable decline over the past twenty to thirty (20–30) years. Natural migration patterns of this population are not known⁷⁸ and given that it is uncertain to what degree this population is reproductively isolated from adjacent nesting populations in the region, the viability of the Rock Island breeding population relative to existing threats remains unclear⁷⁹.

Condition of Foraging Hawksbill Turtle Populations

No quantitative data exists on the density, distribution, or genetic characteristics of Palau’s foraging populations of hawksbills. Most fishermen, however,

agree that hawksbill numbers have declined remarkably in the past twenty to thirty (20–30) years, and that the absence of adults—the only ones able to reproduce—is most noticeable. As for the composition or genetic distinctiveness of Palau’s foraging turtle populations, no information exists.

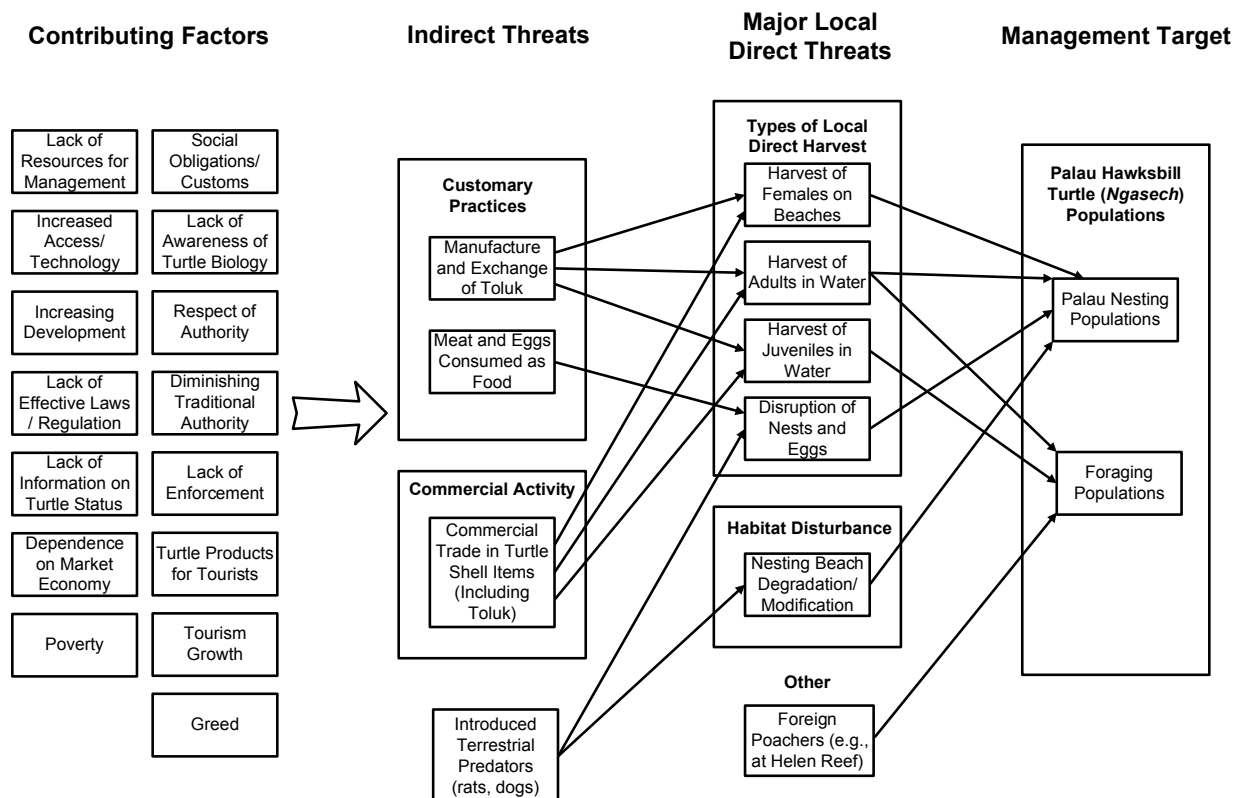
Hawksbill Turtle Use and Other Threats

It is uncertain how many hawksbill sea turtles are harvested annually in Palau. Yet the demand for large adults remains high and the commercial trade in turtle shell continues. Hawksbill eggs in the Rock Islands are frequently poached, leaving few undisturbed nests left to develop (see Table 6-2). A general model of threats to Palau’s various hawksbill turtle populations can be found in Figure 6-2.

Table 6-2. Estimations of Rock Island Hawksbill Turtle Egg Harvest in Palau Based on Stakeholder Consultations (2000) and Previous Records.

	Low Estimate	High Estimate
Percentage of Rock Island hawksbill nests estimated to be poached for eggs ⁸⁰ (an illegal activity).	70%	+90%

Figure 6-2. Conceptualization of Direct Threats to Palau’s Hawksbill Turtle (*Ngasech*) Populations⁸¹



Hawksbill turtles in Palau are primarily hunted for their shell and secondarily for their meat. Large scutes from the carapace of larger hawksbills are manufactured into valuable *toluk*, while scraps from this process and shell from smaller turtles, are crafted into jewelry that is sold in retail stores and gift shops. Non-indigenous predators in the Rock Islands, such as dogs and rats, also have an adverse impact on hawksbill nests and the general success of the nesting process.

Commercial Sale of Turtle Shell

In 1994 the Republic of Palau became an independent nation, freely associated with the United States through the Palau-U.S. Compact of Free Association. During this transition to self-determination, Palau terminated its Trust Territory ties to the U.S., including obligations related to many U.S. laws, policies, and conventions. Prior to 1994, efforts of the TT and U.S. to implement CITES trade restrictions, the TT ESA (the predecessor to the Palau ESA), and USA ESA related to the possession, trade, and export of hawksbill shell appear to have periodically minimized the commercial sale of hawksbill turtle products in Palau⁸². Palau's independence in 1994 marked the end of U.S. jurisdiction over Palau, after which sea turtle regulation immediately diminished and the sale and export of hawksbill shell increased⁸³. By 1995, the increase in commercial sale of turtle shell in Palau had once again become evident, as was reported in the U.S. Pacific Recovery Plan for the species (USNMFS and USFWS 1998a).

Consultation participants, knowledgeable of the sale of hawksbill shell jewelry at local retail stores, confirmed that an increase in sales has been the case in Palau during past years. During the period of this review, eight (8) of twenty three (23) advertised gifts shops in Palau were already selling turtle shell products, some of them displaying extensive stocks (Table 6-3). Given that Palau's government is entrusted with protecting its precious natural resources, it is ironic that some of the most noticeable, high-profile gift shops profiting from the sale of hawksbill shell jewelry are the official shops of the Palau National Museum and the Palau Senior Citizens Center, both of which are supported by government funds. Other high volume gift shops are the George Market (also known as the Tropicana Gift Shop) and the Eli Gift Shop. Hawksbill jewelry has always been a popular craft, and since the U.S. ceased to exert its sea turtle protection policy, the retail sale of hawksbill jewelry has been revived. Even inmates at the Palau National Jail have long been known as skilled producers of turtle shell jewelry, although it is unclear to what extent this jail is presently involved in the manufacturing and selling of turtle shell articles.

Regional Status of Hawksbill Turtles

The hawksbill turtle was listed on the TT's official Endangered and Threatened Species List in 1976, which included hawksbill populations in all Micronesian TT districts. Experts who contributed to the most recent and most comprehensive review of

Table 6-3. Stores Selling Hawksbill Shell Jewelry in Koror, Palau, May 2001.

Name of Store or Gift Shop	Quantity of Turtle Shell Jewelry
	Category by estimated number of pieces on display (Low = 1-10; Medium = 11 - 100; High > 100)
George Market (Tropicana Gift Shop)	High ⁸⁴
Eli Gift Shop	High
Senior Citizens Gift Shop	Medium
National Museum Gift Shop	Medium
Kai Dept Store	Medium
Islander Arts and Crafts	Medium
Lee Buu Gift Shop	Medium
Yolt Gift Shop	Low

Pacific hawksbill turtle populations, indicate that according to current population levels and threats, the hawksbill is considered to be rapidly approaching extinction in the Pacific region (NMFS and USFWS 1998a). It was pointed out by this group that a lack of regular quantitative surveys of distribution and status contributed to the failure to recognize how seriously depleted hawksbill populations had become in the Pacific. This review also noted that “the status of this species is clearly of a highest concern for the Pacific and that it is recommended that immediate actions be taken to prevent its extinction.” Alarming, annual hawksbill nesting numbers in all of Micronesia’s thousands of islands and atolls, may be limited to only a few hundred female turtles (NMFS and USFWS 1998a).

International Protection of Hawksbill Turtles

As early as 1968, the hawksbill species had been listed as “Endangered”, the highest category of threat assigned by the World Conservation Union (IUCN). A re-evaluation of the condition of hawksbill populations, using updated, numerically based criteria (Baillie and Groombridge 1996), prompted experts to change the status of hawksbills from “Endangered” to “Critically Endangered”, according to subsequent publication of the IUCN 1996’s *Red List* of threatened animals (Meylan and Donnelly 1999).

Hawksbill turtles have been afforded protection since 1975 under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Pacific hawksbills were included in Appendix II, and in 1977 Pacific hawksbills were moved to Appendix I⁸⁵. A CITES sponsored review titled *The Global Status of Hawksbills* (Groombridge and Luxmoore 1989) concluded declines and depletion of Pacific hawksbills in fifty six (56) of the sixty five (65) geopolitical units that were evaluated within said region. These declines were substantiated in eighteen (18) areas and suspected (due to lack of conclusive information) in the remaining thirty eight (38) areas included in this study. The authors of this study went on to recommend that Pacific hawksbills remain in CITES Appendix I. CITES hawksbill reservations by member countries were abandoned in 1992 when Japan formerly adopted a zero import quota, falling into full compliance with CITES regulations (Meylan 2001). However, trade between non-signatory nations (such as Taiwan) remains unchecked, as well as the sale of hawksbill jewelry popular among the increasing number of international tourists that visit Palau.

One very important aspect of these conservation achievements, however, is that they do not address domestic trade. Other international instruments, such as the Convention on Migratory Species (CMS), are often more effective in addressing these conservation needs. The hawksbill turtle is currently listed in Appendix I and II⁸⁶ of the CMS⁸⁷. All U.S. (including Pacific) populations of hawksbill turtles are currently listed as “Endangered” under the U.S. Endangered Species Act, and are afforded the highest level of protection under the rules promulgated under this Act (NMFS and USFWS 1998a).

6.1.2.1.2 Green Turtle - Melob (*Chelonia mydas*)

Condition of Nesting Green Turtle Populations

Current estimates suggest that approximately 125 green turtles nest annually in Palau. The highest green turtle nesting density within Palau appears to occur at Merir (Sonsorol State) and Helen Island (Hatohobei State), both located in the Southwest Islands of Palau⁸⁸. These nesting turtles are under the recurrent threat of humans who poach nesting turtles and their eggs. In Palau’s Main Islands, the highest green turtle nesting density site appears to be Ngeruangel Island (Kayangel State), though intermittent nesting also takes place in the Southern Lagoon and in the Angaur areas as well. Nesting at very low densities may occur along coasts of Babeldaob, though an estimate of the annual nesting numbers in these areas is currently unavailable. Green turtle nests are generally vulnerable to poaching throughout Palau, including the Southwest Islands, with reduced poaching probabilities within enforced protected areas, such as the Ngeruangel Atoll Reserve. While no quantitative “viability analyses” have been conducted for green turtle populations, trends indicate that current harvest levels exceed sustainable use, and that green turtle nesting is also decreasing rapidly (e.g., Merir Island) during the past three decades.

Condition of Foraging Green Turtle Populations

No quantitative data exists on the density, distribution, or genetic characteristics of Palau’s foraging green turtle populations. Consensus among fishermen and managers suggests that green turtle populations have declined markedly over the past three decades. Green turtles are reported to be seen in Palau more frequently than hawksbills; however, this perception does not suggest that green turtle populations

are less sensitive to harvesting pressures, nor indicate that they are more abundant.

Green Turtle Use and Threats

A general model of threats to Palau’s green turtle populations is presented in Figure 6-3.

Throughout the Palau islands, green turtles are taken for their meat. Direct take of turtles and eggs appears to be the most detrimental impact to existing populations. Introduced predators (rats, pigs, dogs) in a number of scattered locations may also contribute to negative impacts on turtle reproduction rates. Green turtles are captured for household consumption, as well as for special, more formal events. Respondents indicate that the commercial sale of green turtles is a growing threat that has sparked a demand for ever-greater harvests. Estimates of annual green turtle harvests in Palau based on community consultations and expert knowledge appear in Table 6-4.

Regional Status of Green Turtles

The *Recovery Plan for U.S. Pacific Populations of the Green Turtle* (NMFS and USFWS 1998b), suggests that trends associated with status and threats are such that the Pacific green turtles in U.S. waters outside of Hawaii should probably be classified as “Endangered,” based on the U.S. ESA classification system. It was also noted that green turtle populations outside of Hawaii have severely declined and are most threatened by the direct take of turtles and their eggs. Experts identified unchecked human population growth in the region and its subsequent development as additional threats (NMFS and USFWS 1998b).

International Protection of Green Turtles

The green turtle is listed as “Endangered” worldwide by IUCN (Groombridge 1982), and listed on Appendix I of CITES. The green turtle is also listed in Appendixes I and II of the Convention on Migratory Species (CMS). The Pacific population(s) of green

Figure 6-3. Conceptualization of Direct Threats to Palau’s Green Turtle (*Melob*) Populations⁸⁹

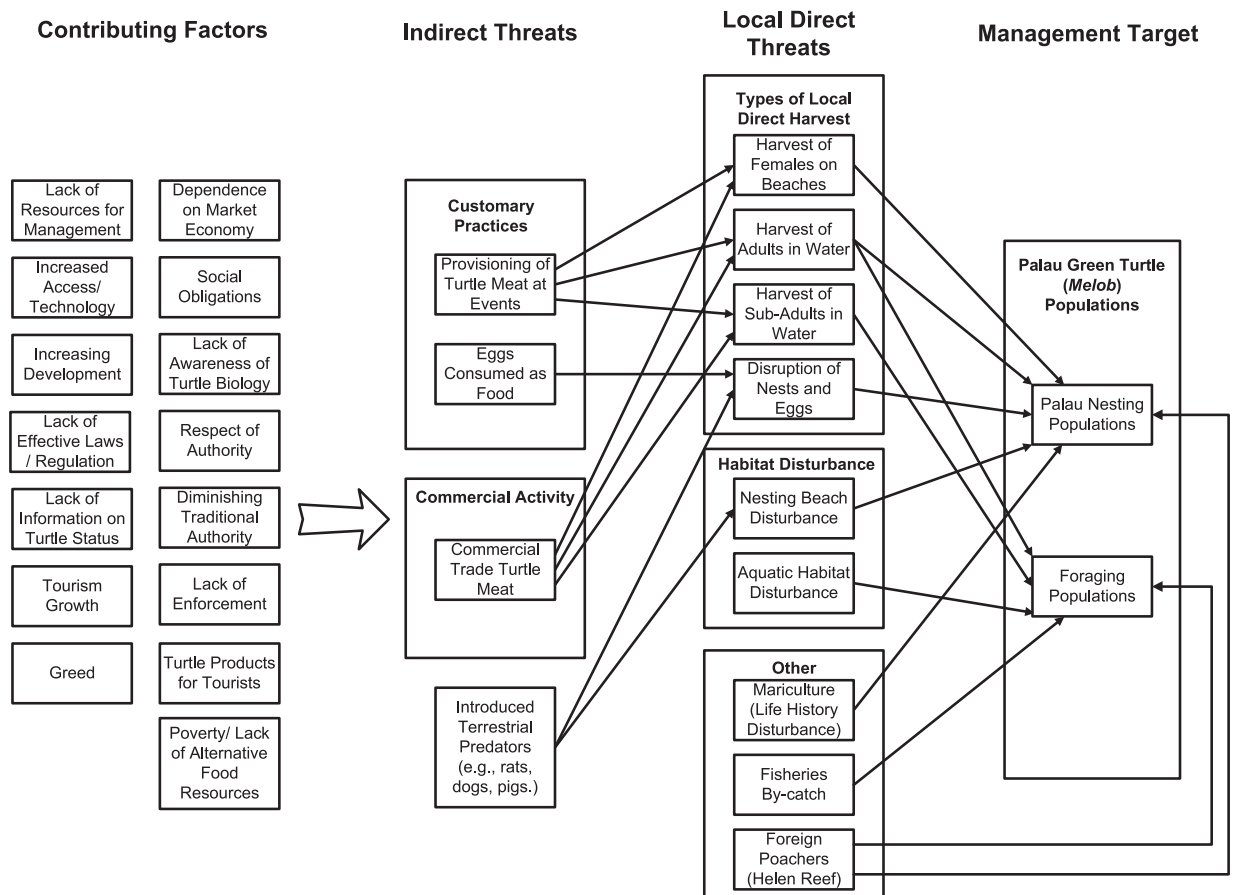


Table 6-4. Estimations of Annual Green Turtle Harvest in Palau, Based on Stakeholder Consultations (2000) and Other Information.

Species and Location	Origin of Calculations and Estimations	Open Season Only (7 months)	Open Season (7 months) + Closed Season ⁹⁰ (5 months)
Direct Harvest of Green Turtle:			
Main Islands			
	For example, it was suggested from consultations in one village that “roughly 3 green turtles per fisherman are captured a month and there are 10 boats in our village” (Ngaremlengui fishermen). Assuming constant harvesting patterns, this amounts to 30 turtles a month ⁹¹ . Further calculations for legal harvest lead to estimates of 210 green turtles legally taken a year in Ngaremlengui alone (30 turtles/month × 7 months of legal harvesting = 210) ⁹² . Multiplying this amount by an equivalent of roughly 5 similar fishing communities in Palau’s Main Islands leads to estimates of 1,050 green turtles harvested during open seasons ⁹³ .	1,050	1,050 (+ 375) = 1,425
Southwest Islands (SWI)			
Eaten or Butchered in SWI	Based on “5–7 turtles taken per month on Tobi” × 4 similar islands (Tobi Fisherman).		
	Low Estimate	140	140 (+50) =190
	High Estimate	196	196 (+70) =266
Transported from SWI to Koror aboard Government Sponsored State Transportation	20–30 turtles per shipment; up to 4 or 5 shipments a year during open season (Resource Manager).		
	Low Estimate	80	Unknown
	High Estimate	150	Unknown
Transported from SWI to Koror aboard National Patrol Boat	4–5 turtles per shipment; up to 3 or 4 shipments a year during open season (Resource Manager).		
	Low Estimate	12	Unknown
	High Estimate	20	Unknown
Harvested by Foreigners Helen Reef			
	Low Estimate	10	1794
	High Estimate	35	60
Totals	Low Estimate Total	1,292	1,632
	High Estimate Total	1,451	1,751

turtles are presently included with other green turtle populations listed as “Threatened” under the U.S. Endangered Species Act and are afforded substantial protection under current rules (NMFS and USFWS 1998b: 11).

6.2 COMMENTS ON NATIONAL POLICY AND EXISTING MANAGEMENT FRAMEWORK

Discussions on the difficulties with turtle enforcement arise so frequently in records and consultations that it would be difficult to argue convincingly that over the past half century Palau’s administrators have achieved adequate enforcement of existing turtle regulations. Management efforts have been made (*e.g.*, mariculture projects, and some education activities), but never to a degree that could be considered effective, sustainable management. This general condition has existed for various reasons: 1) the indigenous notion that turtles exist to be exploited, either for food or for customary materials; 2) the material and social benefits gained from harvesting turtles; 3) because regulations originated from external, non-Palauan sources (*e.g.*, TT Administration); 4) relative confusion regarding regulatory exemptions under the U.S. ESA with respect to the subsistence use of green turtles by Pacific Islanders living within the U.S. TT⁹⁵; 5) a lack of resources for enforcement and management; 6) a court system with limited capacity; and 7) the fact that information on turtle populations and harvest levels is difficult to obtain. During the Trust Territory period, turtle policy in Palau was influenced by the U.S. through the U.S. ESA and conventions that the U.S. was party to (*e.g.*, CITES); only recently has Palau had the opportunity to address issues of national sea turtle policy on its own.

Presently, all major aspects of national sea turtle policy in Palau are described by the Limitations on the Taking of Turtles. Included below is a concise assessment of the strengths and weakness of the Limitations, as well as those of the Palau Endangered Species Act. Additional organizations, programs, and conventions that have the potential to influence national sea turtle policy are also discussed.

6.2.1 Limitations on the Taking of Turtles

The Limitations on the Taking of Turtles (24 PNCA 1201) provides a relatively simple framework for the management of Palau’s turtles. The following is a

concise assessment of its strengths and weaknesses as they pertain to recovery and enhancement management:

Strengths:

- No true strengths, albeit the intended result is to provide a relative degree of protection to turtles⁹⁶.

Weaknesses:

- Allows a wide range of time periods for direct take.
- Restricts only the act of harvest/take and not subsequent use (*e.g.*, individuals who possess illegally caught sea turtles cannot be charged so long as they themselves are not caught in the physical act of harvesting).
- Provides no restrictions on the commercial sale of endangered sea turtles.
- Directs harvest towards larger sea turtle specimens⁹⁷.
- Sets no regulations to be observed during open season except size and activity (*i.e.*, nesting), and therefore condones unlimited harvest with respect to the gender, and more importantly, number of specimens that may be caught (*e.g.*, if partially or fully enforced, it still can allow overharvest).
- It is difficult to enforce, especially given the limited resources known to be available. Does not set any limits with respect to the space and time of harvest—therefore enforcement is more difficult.
- Does not provide adequate sanctions against those involved in aiding and abetting.
- Established regulations, due to difficult conditions, are in many cases virtually impossible to enforce (*e.g.*, it is difficult to determine if females are taken off from a beach as opposed to from the water; it is difficult to determine if a turtle was taken outside of take season if all the evidence that is had is frozen turtle meat).
- Does not sufficiently address the issue of critical habitat.

6.2.2 The Palau Endangered Species Act

However currently unimplemented and un-

enforced, the Palau ESA (24 PNC 1001-1012) appears to have the potential to strengthen Palau's management framework in terms of providing better protection to local sea turtle populations. New Palau-specific regulations have recently been proposed (Anonymous 2001), a direction that if followed could vitalize the presently unused Act⁹⁸.

Strengths:

- Imposes higher restriction on direct take and use of turtle through the establishment of a permit process.
- Prohibits commercial sale and export of turtle and turtle byproducts.
- Allows for the levying of substantial fines (up to \$10,000 USD) against found violators.
- Allows for the take and use of species from specific areas for subsistence food or traditional purposes, as long as such take does not further endanger species in question.
- Quota on sea turtle harvest could be imposed through exemption permits issued by Minister.

Weaknesses:

- Does not require the development and implementation of recovery plans with clearly defined goals for recovery or delisting of threatened and endangered species.
- Even though the Palau ESA provides authority for the acquisition of land or aquatic habitat, the extent of its application to protect critical sea turtle habitat remains unclear.
- Does not identify a clear, transparent, objective process through which animals are listed or delisted.

6.2.3 Supporting Networks: Agencies, Public Corporations, Non-Government Organizations, Interest Groups, and Conventions

Included in the description of Palau's turtle management framework is a growing network of non-government organizations (NGOs), public corporations, and other institutions that together contribute to sea turtle management. Although these institutions have no official regulatory authority *per se*, they can and do

provide useful information and pertinent management advice, both important for turtle management and enhancing recovery. For example, research institutions can provide critical information helpful to management and policy decisions. The Palau International Coral Reef Center (PICRC), a recently established, government sponsored research institution, is mandated to monitor reef ecosystems and provide advice to traditional leadership, national government agencies, and the general public. The current role of PICRC could extend to sea turtle research and monitoring, especially given the Center's current function as a regional monitoring node for Micronesia and its institutional links with SPREP. Similarly, local and international conservation NGOs (such as the Palau Conservation Society, The Nature Conservancy, and the Community Conservation Network) provide important information on sea turtles to government agencies, resource managers, and decision makers. Palau is a member of The South Pacific Regional Environment Program (SPREP), and as such is eligible to participate in the inter-government organization's Regional Marine Turtle Research and Conservation Programme. Finally, Palau's participation in the Convention on Biological Diversity does establish a framework and obligations concerning the management of the nation's biological diversity, which includes Palauan sea turtle populations.

6.3 POLICY IMPROVEMENT: RECOMMENDATIONS FOR ENHANCING PALAU'S EXISTING SEA TURTLE MANAGEMENT FRAMEWORK

Because all available evidence indicates that Palauan turtle populations are in a state of decline, new policy may help to reverse the current situation. And while it is obvious that making new policy alone will not provide a simple solution to Palau's sea turtle problems, changing policy will, however, establish clearer direction and goals for long-term management that are currently not in place. A broad strategy and a new, more comprehensive approach are needed immediately to stop and reverse the direction of negative trends, thus promoting the health and sustainability of remaining populations. Success will depend on a realistic appraisal of existing threats, up-to-date knowledge of sea turtle biology, the best available information on the status of Palau's turtle populations, and an appreciation of local cultural contexts and constraints.

Redesigning and investing in Palau's current turtle management system will be necessary for recovery and better management of Palau's turtles, whereas continuing on the same course without redirection will most likely lead to continued decline of populations, and possibly even to local extinctions⁹⁹. Given the context of marine resource management in Palau, it appears that local and customary controls (*e.g.*, state laws, *buls*, conservation areas) can assist in turtle management efforts, with the support of local governments, traditional leaders, communities, and conservation NGOs. These local arrangements can contribute to the recovery and management of sea turtles. They are unlikely, however, to be sufficient either collectively or independently in terms of their ability to address all important threats facing Palau's sea turtles. Given the complexity of turtle management issues, national leadership and the setting of broad management goals is essential. National leadership appears necessary to gain nationwide compliance and set overarching goals and is responsible for ensuring the effective enforcement of laws, the sharing of information, promoting fairness in conservation and use, and participating with other nations that are working together towards regional sea turtle conservation.

6.3.1 Principles and Suggestions for Management

Management principles are provided to assist the development of sea turtle policy in Palau. These principles include advice from scientists and conservation organizations engaged in sea turtle management, research, and recovery activities.

Principles 1–3:

The first set of principles (Principles 1–3) and associated text are derived from the IUCN's Global Strategy for the Conservation of Marine Turtles (IUCN 1995).

Principle 1: The concept of integrated management is crucial to sea turtle management.

"The concept of integrated management is crucial to marine turtle conservation in several ways: 1) marine turtle management should be incorporated into coastal management regimes to ensure that habitat quality and ecosystem functions are maintained; 2) marine turtle management should be included at local, re-

gional, and global levels so that those people directly affected by management, as well as those who have influence over regional and global activities, are involved; 3) management of any marine turtle species or population should be integrated across its entire geographic range so that activities in one part of the range do not undermine conservation management in other areas of its range."

Principle 2: Involve local peoples in management issues and decisions.

Turtle management and conservation cannot (or is extremely difficult to) take place without the full involvement of local people, especially those people who depend and/or have an impact on turtles. "[T]here is an emphasis...on the need to involve the local people who utilize marine turtles in their conservation and management. At the heart of the debate is making appropriate decisions about use, an issue which is hard to resolve given our incomplete knowledge of these species and the amount of time required for the effects of overexploitation to be noted."

Principle 3: Promote ecologically sound, sustainable use.

Management issues concerning declining turtle populations long have involved debates over the exploitation of remaining turtles. "Most recognize the significance of marine turtles in the cultural and social lives of many coastal people and the importance of these animals and their eggs as a source of protein. Too frequently, however, the wide use by a growing human population, coupled with the migratory nature and slow rates of natural increase of these animals, has resulted in most utilization being non-sustainable. Clearly, failure to stop or reverse these declines will result in the eventual extinction of marine turtle populations" (IUCN 1995).

Principles 4-6

Three other principles may be useful when designing recovery and sustainable management strategies for Palauan sea turtle populations. Principle 4 may be applied in cases of irreversible loss and situations of incomplete information. Principle 5 focuses mainly

on approaches for dealing with cases of incomplete information. Principle 6 is a suggestion for ordering priorities when considering sea turtle management strategies related to commercial use, cultural use, and the survival of turtle populations.

Principle 4: Use a precautionary approach in natural resource and biological diversity management.

A “precautionary approach” recommends that decisions regarding the management of—or the impact had on—natural resources and biological diversity take into account all potential risks (in addition to expected benefits) of proposed activities. Broad objectives in management should also involve consideration of long-term interests, while at the same time attempt to avoid irreversible or slowly-reversible negative impacts. To be precautionary means to avoid activities that are potentially harmful to the protected resources in question. Lastly, a precautionary approach takes into account the almost unavoidable gaps and uncertainties in knowledge that are common when dealing with complex systems, especially natural ones. A precautionary approach recognizes the need to take appropriate action despite the fact that not all variables are completely understood. The precautionary approach is espoused by international agreements such as the Convention on Biological Diversity (CBD), of which Palau is a signatory¹⁰⁰.

Principle 5: In cases in which collection of more rigorous quantitative data is unlikely or unfeasible, use knowledge that is based on research on other similar systems together with local knowledge to assess and form management decisions.

A relatively new extension of the last precept of the precautionary approach is what some have termed a “data-less” management approach (Johannes 1998). Johannes argues that data-less marine resource management, in addition to its underlying precautionary approaches to resource management, further emphasizes situations in which characteristics of natural systems are not, nor are likely to be, thoroughly known to traditional quantitative standards. In these cases, and when imperatives demand, manage-

ment decisions or action based on data-less methods—basically utilizing 1) principles learned from other research and 2) local knowledge—are better than no management decision or action at all (Johannes 1998). This is especially true in cases in which sufficient quantifiable data for traditional analysis appears difficult or impossible to collect, too impractical or too expensive, and is likely to remain so indefinitely. Such a condition readily describes the situation Palau finds itself in relation to information on its sea turtle populations, where collecting the data needed for the thorough understanding of turtle populations in a rigorous quantitative sense (given current conditions and costs), is unlikely and nearly an impossibility.

Principle 6: When there is a conflict of interests in sea turtle use, cultural use takes precedence over commercial use, and conservation of species takes precedence over cultural use.

SPREP has suggested an auxiliary principle for prioritizing objectives related to marine turtle use and conservation in the Pacific region (Limpus 1993). Principle 6 includes elements of the principles above (mainly Principles 3, 4 and 5), in establishing a logical system of prioritization for management that supports the cultural use of turtles only when it does not jeopardize the long-term survival of turtle populations.

6.3.2 Outline for Sea Turtle Recovery in Palau: Priority Steps for Improving Management

The following outline provides suggested objectives and actions for improving sea turtle management in the Republic of Palau¹⁰¹. It is recommended that the Republic design and select policy (and implementation plans) that will address all of the following management objectives and/or concerns. Suggestions for specific policy modification include:

6.3.2.1 Eliminate or reduce direct harvest levels to allow for species stabilization and recovery.

6.3.2.1.1 Develop a new national management framework that reduces turtle mortality due to direct take, closes legal loopholes, and improves the efficiency/effectiveness of law enforcement and governance.

- End all turtle-related commercial activity.
- End government-facilitated direct take, including take related to government functions, government-funded or -supported transshipment (e.g., the national Patrol Boat or state transport vessels).
- Eliminate transport between Palau's turtle harvest/supply areas and areas of turtle demand.
- Significantly reduce or completely eliminate harvest for informal subsistence use.

6.3.2.1.2 Maintain education and awareness programs.

- Increase awareness and compliance among all stakeholder groups.
- Host periodic workshops and seminars to enhance planning and data dissemination.
- Plan for and sustain the ensuing programs that will be needed for long-term conservation.

6.3.2.1.3 Improve general enforcement.

- Increase the severity of penalties.
- Increase public knowledge of laws through education and general public awareness.
- Increase the number and authority of local law enforcement/conservation officers.

6.3.2.1.4 Create and enforce development laws within local and national marine protected areas.

- Promote MPAs as part of a strategy to protect habitat, foraging and/or nesting turtles, and eggs from direct harvest.

6.3.2.2 Develop and implement management policies for the management of critical habitat.

6.3.2.3 Monitor and control direct and indirect threats as is necessary.

6.3.2.4 Evaluate the operation and usefulness of sea turtle headstarting on Merir Island.

- Examine the legitimacy of exemptions granted to Sonsorol State in conducting sea turtle mariculture activities on Merir Island (Nakamura 1997; CCN 2001).

6.3.2.5 Promote research and monitoring.

- Establish a centralized, long-term monitoring program within a national or quasi-national agency, such as the Palau Marine Resource Division or the Palau International Coral Reef Center. This monitoring program should aid in addressing management related issues, developing standardized monitoring protocols, and assisting in aspects of technical research.
- Assist communities in setting up their own monitoring programs; conduct training of community members in monitoring techniques.
- Promote participation of research and monitoring with the SRPEP Regional Marine Turtle Research and Conservation Programme and the Marine Resource Pacific Consortium-Palau (MAREPAC-PALAU).
- Participate in U.S. NMFS satellite tracking activities in collaboration with Koror State, PCS, and PICRC; incorporate educational components.
- Perform genetic research of key population areas (e.g., Rock Islands, Southwest Islands, Northern Palau).
- Solicit funding from SPREP (via the Regional Marine Turtle Research and Conservation Program) and other sources for monitoring activities and/or for the procurement of qualified expertise.

6.3.2.6 Join and support international conventions.

- Become a party to the Convention on the International Trade of Endangered Species (CITES) and the Convention on Migratory Species (CMS).
- Fulfill obligations of Palau's participation in the CBD.
- Consider signing the Indian Ocean - Southeast Asia Memorandum of Understanding on Sea Turtle Conservation.

6.3.2.7 Promote partnerships between government agencies, traditional leaders, educators, NGOs, scientists, and the private sector.

- Since no one agency or group alone can

solve the problems associated with sea turtle management in Palau, cooperation and productive synergies need to be developed through effective partnerships¹⁰².

6.4 Species Management Recommendations Related to Direct Take

6.4.1 For Hawksbill Turtles

Recommendation:

Establish a complete ban on the take of hawksbill turtles and a complete prohibition of commercial sale and export of hawksbill shell products.

Justification:

- Hawksbill nesting is perceived to have declined to unprecedented low levels in Palau, especially in the Rock Islands area.
- The number of hawksbill sightings in Palau waters has decreased steadily.
- Additional harvesting of hawksbill turtles is not necessary for the continuance of traditional exchange of *toluk* among Palauan women.
- Hawksbill turtles are threatened more by international trade than any other marine turtle species.

6.4.2 For Green Turtles

Recommendation:

Either prohibit green turtle harvest completely in all its forms, or develop a system that allows only restricted take of green turtles, which permits only narrowly defined take of green turtles for traditional purposes, and prohibit commercial sale of green turtle completely.

Justification:

- Green turtle nesting is reported to have decreased drastically at locations in Palau's Main and Southwest Islands.
- The number of green turtles, like hawksbills, is declining according to fewer reported green turtle sightings.
- Nearly all recent consultations suggest that Palau's human population can easily meet

all its nutritional needs and subsist without the harvesting of sea turtles.

6.5 Policy Mechanisms for Enhancing Turtle Recovery in Palau

In order to effect changes in new policy that addresses the needs and concerns of Palau's citizens in particular and the world community in general, policy makers must answer the following question: 'How should Palau take steps to increase the chances for the long-term survival of its remaining sea turtle populations?'

Awareness of the above conditions (Sections 6.1 and 6.2), principles (Section 6.3.1), and management advice (Section 6.3.2 and 6.4), provides a broad array of possible steps Palau can take to improve the current condition of its turtle resources. Although current information that can be used for general discussion purposes is shared, the specific goal of this section is to provide a roadmap for the creation of new or revised policy that will enable effective marine resource management in Palau. Regardless of what strategy is chosen by Palau's decision makers, addressing this complex issue will necessitate the joint coordination and participation of government, scientific, private, and public agencies and institutions¹⁰³.

Unless Palau's national policy regarding sea turtles is revised, as an overwhelming majority of testimony in this review and other relevant information indicates, Palau's turtle populations will continue to decline. If current conditions and practices remain unchanged, the local extinction of Palau's nesting green and hawksbill turtle populations appears not just likely, but a mere question of how soon. In order to reverse these trends and keep in check present threats, Palau's management framework needs to be made far more comprehensive than it is at present. But judging by the deterioration that sea turtle stocks appear to have already suffered, the establishment of a nationwide plan that considers all possible measures and human-related activities for turtle population management and recovery may by itself not be enough, and policy changes need to be translated into action soon. In order for a turtle recovery plan to be effective—more than just policy—it will depend on how timely and true to its mission its implementation becomes.

According to sea turtle biologists and the large majority of participants interviewed during this review, a reduction, or complete elimination, of direct

take of sea turtles and their eggs is the single most effective measure that can be taken to reverse sea turtle population declines in Palau. Therefore, successful, nationally-sustained management strategies should consider addressing the role played by the direct take of sea turtles because non-commercial and customary turtle use account for a large portion of turtles harvested in Palau each year. For this reason, conservation and recovery efforts that do not address the direct take of turtle for these abovementioned purposes are not likely to be successful.

To be effective, new policy mechanisms based on modified national legislation should follow multiple criteria that not only address the management and recovery of sea turtle populations, but that are also culturally sensitive and appropriate for Palau’s setting. For example, new policy and legislation that deal with sea turtle management and recovery in Palau, must weigh not only the survival of turtle species, but also weigh what methods would be most harmonious in terms of incorporating effective enforcement or the potential for continued use of turtle as it relates to Palau-specific customs and social institutions.

Suggested criteria (among possible others) by which proposed new policy mechanisms could be judged:

- Use of “best-practices” and biological soundness
- Ease of enforcement
- Degree of technical or resource requirements
- Adaptability of mechanism through monitoring, learning, and change

- Cultural appropriateness / social acceptance
- Potential for overall, long-term effectiveness

Once new policy is enacted, and a mechanism is set in place, enforcement and monitoring will become the next priorities for success. For this reason, when modifying Palau’s existing sea turtle management framework, policy makers must ensure that ease and reality of enforcement is given priority.

Four policy mechanism options are offered for consideration in Table 6-5. Summaries and assessments of these mechanism options are also offered in the section that follows.

Option 1. Adopt regulations that will enable the Palau Endangered Species Act. When drafting regulations, list all species of sea turtles found in Palau, and further refine restrictions within proposed regulations.

The Palau ESA was established to provide a sound framework for the protection of vulnerable plant and animal species. With respect to sea turtles, Palau ESA provisions could be applied as strategies for turtle recovery and management. Guidelines within the Palau ESA were designed to be thorough, flexible, and adaptable. Measures were also included to provide reasonable incentives for compliance. However, to date the Act remains un-implemented.

Recently, proposed regulations (Anonymous 2001) have been drafted for the consideration of Palau’s policy makers. Listed below are important modifications to these draft regulations designed to enhance the

Table 6-5. List of Policy Mechanism Options for Enhancing the Recovery of Turtles in the Republic of Palau.

Option 1.	Adopt regulations that will promote the Palau Endangered Species Act. When drafting regulations, list all species of sea turtles found in Palau, and further refine restrictions within proposed regulations.
Option 2.	Prohibit all direct take of hawksbill and green turtles until such time turtle populations are able to stabilize and recover.
Option 3.	Allow for the subsistence use of green turtles, while completely prohibiting direct take of hawksbill turtles.
Option 4.	Explore the adoption of new co-management arrangements for green turtles, while completely prohibiting direct take of hawksbill turtles.

ESA's effectiveness in relation to sea turtle management:

- Include as protected listed species, all species of sea turtles in Palau due to their biological characteristics and the adverse trends and conditions known to threaten them.
- Once a list including Palau's sea turtles are adopted, revoke Palau's Limitations on the Taking of Turtles.
- Prohibit take, possession, and trade of all hawksbill turtles and their byproducts. Exclude hawksbills from traditional use exemptions until the achievement of proposed recovery goals can be varied and documented. However, always allow for the continued possession and circulation of already existing *toluk*¹⁰⁴.
- In reference to allowances for traditional exemptions included within the draft regulations (Anonymous 2001), modify currently proposed turtle size restrictions to allow only for the harvest of green turtles with a tail length longer than twenty (20) cm., thereby ensuring that the controlled take of green turtles will never allow the capture of female specimens¹⁰⁵.
- In the case of take allowed due to any exempted purposes, require that the hunting of turtle be done through traditional methods so as to not harm or injure targeted animals (e.g., green turtles taken must be captured and transported to shore alive and unharmed, where it can be verified that turtles meet regulation catch criteria before butchering)¹⁰⁶.
- Develop a mechanism for the perpetual protection of nesting beaches and other critical habitat¹⁰⁷.
- Tailor proposed Palau sea turtle recovery standards (Appendix 8) to guide decision-making regarding the recovery of sea turtle species¹⁰⁸.
- Implement a monitoring system to evaluate the progress of recovery efforts and the possibility of safely resuming, on a limited scale, direct take.

Evaluation of Option 1:

Strengths:

- Provides a strong regulatory framework for the management of turtles.
- Allows for *bona fide* traditional uses through exemption as determined at the discretion of Palau's Minister of Resources and Development.
- Provides a mechanism that allows for the continued possession and use of *toluk* among Palauan women.
- Implementation of currently proposed regulations would ensure complete protection of hawksbill turtles.
- Prohibits the commercial use of marine turtle products and byproducts of any kind.
- Permits granted for allowable uses would also serve to monitor all authorized activities related to turtle take.
- Would allow, as proposed in the recommendations above, for the capture of only unharmed adult male turtles, and only for certain culturally sanctioned uses.

Weaknesses:

- Will require additional personnel and resources for the administration and supervision of exempted take.
- Offers no plan for the protection of critical habitat.
- No clear indication of standards or guidance for the setting of quotas or of annual harvest levels, if any.
- Compliance and enforcement may at first be difficult to achieve, due to the time it will take for citizens to become accustomed to changes in regulations.
- It will be difficult to differentiate between existing turtle shell items and modern, illegally harvested turtle shell items, unless an effective registration system can be implemented.

Option 2. Prohibit all direct take of both hawksbill and green turtles until such time turtle populations are able to stabilize and recover.

If Option 1 is not preferred or cannot be implemented in a timely fashion, ban the taking of all sea

turtle species in Palau. A complete ban on all take and uses of turtle would be the surest way to allow species recovery. Other direct and indirect threats (*e.g.*, degradation of nesting and foraging habitat) need to be eliminated or significantly reduced. In anticipation of Palauan's possible wishes to resume turtle take once repopulation goals have been exceeded or at least met, a monitoring program with clear indicators should be devised to measure the attainment of proposed recovery standards (see Appendix 8). Only after the initiation of such monitoring programs identifies that all established recovery goals have been met, should a sustainable level of harvest be permitted to resume.

- Except in the case of culturally sanctioned exemptions, prohibit all take, use, and possession of both green and hawksbill sea turtles and their byproducts.
- Allow exemptions for turtle harvest and use strictly for traditional purposes only, and impose strict monitoring and enforcement of these exemptions.
- Policy should be developed to give official recognition (through appropriate exemption) to the possession and circulation of *toluk* shell, and the role it plays in the lives of Palauan women in particular and Palauan culture in general. However, so that *toluk* and the species from which *toluk* is made can both coexist, the creation of new *toluk* and all other uses of hawksbill turtle shell should be placed under indefinite moratorium (until such a time evidence exists that turtle populations have been successfully replenished).
- Develop mechanisms for the perpetual protection of nesting beaches and other critical habitat¹⁰⁹.
- Establish commensurate fines and penalties that are severe enough to deter would-be violators.
- Implement a monitoring system to evaluate the progress of recovery efforts and the possibility of safely resuming direct take.

Evaluation of Option 2:

Strengths:

- Simple to understand.

- Comprehensive and easier to understand (enforcement-wise) than existing regulations because of simple rules.
- Addresses recovery recommendation standards to the maximum degree, while still allowing for limited traditional use.

Weaknesses:

- Depends on the creation of new legislation.
- Compliance and enforcement may be difficult initially, as residents become accustomed to new regulations.

Option 3. Allow for the subsistence use of green turtles, while completely prohibiting direct take of hawksbill turtles.

A less restrictive option would involve revoking all existing legislation and drafting a new basic statute that takes preliminary steps in improving the condition of harvest, while populations and levels of harvest are being studied and monitored. Such a statute could recognize the continued desire for subsistence use of green turtles, while completely prohibiting the take and use of hawksbill turtles. Harvest of large turtles would need to be prohibited under this option because of the likely possibility of overharvest (due to relatively open regulations); adult, sexually mature turtles should be left alive to allow the best opportunity to replenish population numbers¹¹⁰. Besides, the protection of large turtles should not interfere with household subsistence use, due the smaller requirements of a household relative to a large gathering or event. Other green turtle uses (*e.g.*, commercial sale) would need to be prohibited. Over time, government agencies would be legally mandated to assess the level of take, turtle population levels, and sustainability estimates for long-term management.

- Define and allow for the household subsistence use of green turtle.
- Prohibit the take of green turtle with a carapace longer than twenty-eight (28) inches straight carapace length ([SCL], or its curved carapace length [CCL] equivalent).
- Limit harvest season to fewer months per year than current regulations allow.
- Prohibit all take, possession, and use of hawksbill turtle and byproducts with the

exception of the possession and circulation of pre-existing *toluk* shell.

- End the commercial sale of all turtles and their byproducts.
- Prohibit take of adult female turtles (not only nesting ones) and eggs.
- End the transport of turtles on government-sponsored vessels, as well as the serving of turtle meat at government sponsored events and functions.
- End the use of turtle at funerals and other “Custom” functions.
- Establish and fund a monitoring system to assess population status over time, the level of take for subsistence use, and other threats.

Evaluation of Option 3:

Strengths:

- Recognizes a current reliance on turtle as supplemental to the diet of poorer families of Palau.
- Improves on the current situation while allowing more time to evaluate the status of turtles and take in the Republic.
- Immediately prohibits all commercial use.
- Addresses the protection of the most threatened species, the hawksbill.

Weaknesses:

- Turtle harvest may continue to be too high for long-term sustainability.
- The policy of take and use for subsistence-only purposes is difficult to enforce¹¹¹.
- Scientific programs should be funded through legislation, otherwise funding may not exist for needed assessments.

Option 4. Explore the adoption of new co-management arrangements for green turtles, while completely prohibiting direct take of hawksbill turtles.

Option 4 includes the development and testing of legal mechanisms to support shared (or co-) management of sea turtle populations between national, state, and traditional authorities. This approach would

involve local tenure, traditional authority, and innovative co-management systems for a stricter regulation of authorized turtle take. Many in Palau have said that the means to conserve sea turtles more effectively is to allow take only for traditional purposes and only by traditional methods, and to have traditional leaders dictate and be involved with issues of turtle harvest. Others, including a number of resource management experts, have indicated that the reestablishment of traditional local marine resource management practices could yield great benefit. Palau has a long history of traditional management that when enforced locally and within established social systems, may provide a more efficient degree of control when and where needed. These are important ideas for a country like Palau, especially in light of the fact that current centralized resource management of endangered flora and fauna by itself has not proven to be widely successful. However, even though a system of strong, locally enforced control appears to be essential for the effective management of any reef fishery—including harvest of turtles—there remain other important roles for a national government to fulfill, such as providing support, harmonizing local-level management systems, providing fail-safe mechanisms (e.g., nationwide quotas or species restrictions), and in cases of human activity deemed detrimental, pre-empting local authority through restrictions (Graham 2000b).

Such a model for sea turtle co-management (depicted in Figure 6-4) would build on recommendations from Johannes (1991), Graham (1998) and others, for sharing responsibility of coastal marine resource management in Palau. A similar or modified approach would recognize the value of traditional authority with respect to regulating customary use of turtles. Furthermore, this type of mechanism would be better suited to enforce a stricter quota system, thus maximizing the chances for sea turtle recovery and sustainability. Although shared turtle resource management in partnership with traditional authority on a national scale is at present an unexplored possibility, should such a system be implemented wholly or in part, policy makers may consider the following:

- Palau’s national government and traditional leaders, with advice from natural resource managers, must set national harvest levels for green turtles applying a precautionary approach. These harvest levels should be linked closely to clear, long-term conservation

and management goals. National government, in collaboration with the Council of Chiefs, decides on an appropriate allocation for each state's jurisdiction. The rules for allocation may be simple, complex, or arbitrary, but in the end an agreement could be reached. An example of such a decision is the allocation of Palau's revenues generated from foreign fishing licenses between national and state entities through an arbitrary formula based on administration, jurisdictional population, and water area.

- Co-management jurisdictions would then choose how decisions are made regarding distribution and allocation based on local needs, particular priorities, and relationships between traditional leaders and state governments; for example, such a system can be developed by traditional leaders on their own, or in close alliance with traditional authorities and state governments, as in Kayangel.
- Enforcement and compliance can be greatly simplified through the use of specially numbered badges or certificates to identify and prove that each captured turtle was harvested in accordance with national, state, and/or traditional rules and regulations.
- State law enforcement officers would be granted authority to assist in the co-enforcement of management regulations within state jurisdictions. Traditional enforcement and compliance matters would be left up to the discretion of local chiefs.
- No transshipment of turtles or turtle products would be allowed outside of the jurisdiction where the harvest was permitted.
- Implement a monitoring system to evaluate the progress of recovery efforts and the possibility of modifying direct take levels.
- Such a management framework would permit agreed-upon harvest levels of male green turtles until monitoring information warrants changes in harvest policy.
- Hawksbill turtles would be banned from take completely without exceptions of any kind.
- Commercial sale or possession of hawksbill turtle and/or by-products would be prohibited, except in the case of customary posses-

sion and exchange of previously existing *toluk*.

Evaluation of Option 4:

Strengths:

- Builds on Palau's traditional system of marine resource management, while adding additional safeguards against overharvest and further endangerment of turtle populations.
- Limits harvest in time and space and restricts possession, improving enforceability.
- Uses a quota system for placing a limit on allowable take.
- Can be used with allowances for traditional use within the context of currently proposed Palau ESA regulations (Anonymous 2001).
- Provides a system for adaptability and flexibility.

Weaknesses:

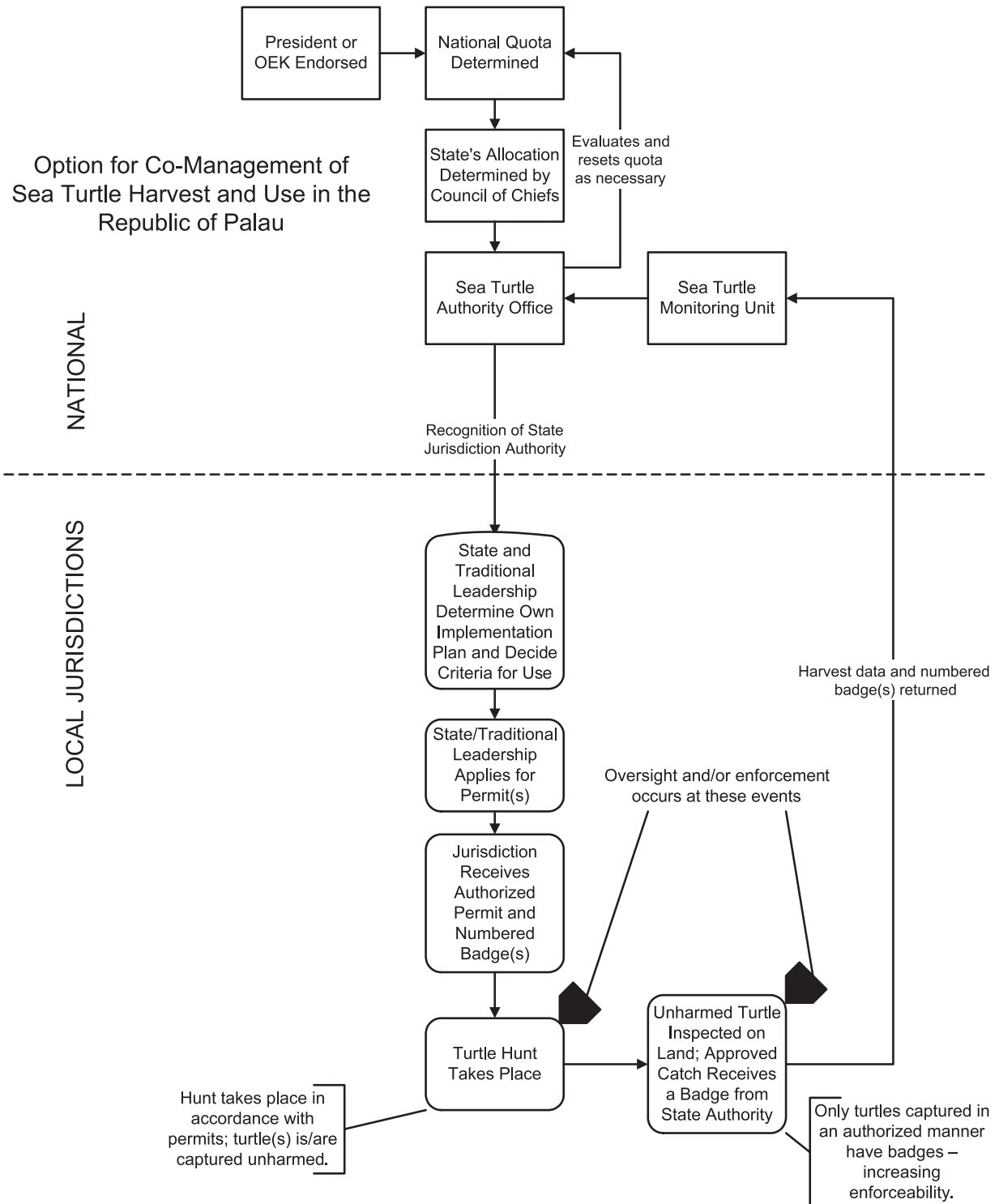
- Would require unprecedented cooperation between national, state, and traditional leaders to be successful.
- Requires new and significant inputs of management oversight and coordination; however, no form of improved management can come without cost.

6.6 Process Recommendations as Next Steps

All of the above management options are offered specifically to help Palau's leaders and decision makers institute new policy that will be effective in the conservation of Palau's sea turtle populations. The following are process-oriented suggestions that outline a series of next steps designed to initiate and sustain a new, comprehensive sea turtle recovery program for Palau:

1. **Ask Palau women's groups for their help to support sea turtle conservation efforts.** Women's support will be needed to develop new policy that affords protection to hawksbill turtles, from which women's traditional money is made. This may include a moratorium/ban on the manufacturing of new *toluk*

Figure 6-4. Green Turtle Co-management Model between National, State, and Traditional Authorities



(and all other turtle shell products), until populations of hawksbill turtles recover. Also, because of the influence of the women's role in the selecting and preparing of food, recognition and acceptance of the need for conservation measures among women may be influential in reducing the number of turtles served during social functions.

2. **Seek the services of a knowledgeable legal counsel to 1) evaluate the applicability of implementation of the Palau Endangered Species Act of 1975, and 2) draft proposed legislation.** Some evidence suggests that the Palau Endangered Species Act may be presently enforceable, despite the existence of a TT-era species list. A legal opinion should be requested, and documentation and recommendations prepared. After the above four (and any other) policy mechanisms have been considered by Palau's National Congress and other relevant decision makers, consensus must be accurately incorporated into laws or policy. Employing a legal counsel to assist this process will ensure that important regulatory elements are accurately incorporated into legislative bills, or proposed regulations or rules and become an active part of current sea turtle management policy.
3. **Develop a special outreach program to gain the participation and support of community leaders and individuals of high status in Palau.** The participation of these individuals is of extreme importance to the success of conservation efforts due to their influence in sea turtle enforcement and use.
4. **Initiate and sustain a broad awareness program that focuses on sea turtle biology and conservation.** Immediately begin the establishment of a permanent sea turtle education and awareness program aimed at changing attitudes and behaviors related to sea turtles. Based on the results of this review and developing conditions, assess the need for additional research on stakeholder perceptions and attitudes, or other topics of

relevance to sea turtle management. It is imperative that this educational program has long-term goals and that its mission is permanently sustained and not abandoned after a short period of time.

5. **Where appropriate, obtain expert opinion on the issues of turtle population viability and sustainability.** Some turtle management analysis and decisions require levels of information currently unavailable or unknown. Turtle population viability analyses and sustainability estimates, in addition to other forms of population information, may be desired to monitor the progress and effectiveness of new management strategies. Furthermore, these assessments may also be needed for prescriptive recommendations to managers and resource-owning communities (see Appendix 8: 3. Suggested Priority Actions, Priority 1 D - Other high priority actions) depending on levels of confidence sought. Despite the desirability of rigorous information needed for the abovementioned assessments, principles of "precautionary" and "data-less" (or "data-poor") management should be considered at all levels of management. Waiting on information to be collected in the future should not impede immediate management action considered to be prudent and necessary—based on general knowledge of current conditions and sea turtle biology.
6. **Seek assistance from co-operating agencies and institutions for sea turtle management and recovery program development.** Develop cooperation between agencies, research institutions, conventions, and turtle conservation programs¹¹² that can help promote the conservation of Palau's sea turtles. Periodic multi-stakeholder workshops and seminars would increase data dissemination, build wider awareness of sea turtle issues, and promote cooperation among relevant institutions and communities.
7. **Initiate the process of developing a comprehensive national management plan for Palau's sea turtles.** Creating the conditions

necessary for the recovery of Palau's sea turtle resources will require considerable effort and coordination among organizations, individuals, and networks involved and/or willing to assist. To ensure that efforts and policy are well coordinated within an overall strategy, a comprehensive national sea turtle management plan will be critical in organizing the many turtle-related goals, actions, and priorities that will arise. Such a plan should address 1) current turtle status, 2) threats, 3) information and research needs, 4) strategies for recovery, 5) involvement of local communities, 6) education, and 7) international cooperation. This plan should consider the need for the prioritization of activities, and an adaptive approach to long-term sea turtle management (*e.g.*, Margoluis and Salafsky 1998; Salafsky *et al.* 2001).

8. **Develop the implementation of a monitoring program.** Confirmation of the attainment of recovery goals (or increasing decline of turtle populations) will require clarification of long-term policy goals and the establishment of a monitoring system that

provides information pertaining to selected goals. Such a program (*e.g.*, TNC 2000; Margoluis and Salafsky 1998), designed in consideration of constraints and costs, should involve the monitoring of the following: 1) threat-based impacts (*e.g.*, harvest levels), 2) progress of process-oriented objectives (*e.g.*, number of participating communities involved in conservation efforts), and 3) biological information (*e.g.*, the number of nesting turtles contributing to the reproduction output of a particular beach). Sea turtle monitoring proposals and plans have been proposed by many interested or involved with turtle management and biodiversity conservation in Palau (Richardson 1992, in Maragos 1992; HSG 1997; Graham 2000c, 2000d, 2000e). After policy goals have been identified, a monitoring needs assessment should be conducted to consult these as well as other sources of information to identify efficient and effective monitoring strategies and additional sea turtle research needs.

7 CONCLUSION

Given the perspectives provided in this review, it is clear that the Republic of Palau faces difficult decisions on how to pursue sea turtle management within its waters. For nearly three decades, efforts by Palauan, Trust Territory, and U.S. policy makers to establish more effective regulation of sea turtle populations have failed to become well established. The optimistic message conveyed in the 1997 TT High Commissioners' Annual Report to the U.S. Secretary of the Interior that an endangered species act had been put into effect and a list of species adopted never lived up to its potential in Palau, as truly sufficient protection for sea turtle populations has yet to be implemented. Report after report on the status of turtles (and other endangered species) continue to indicate the difficulties in actualizing compliance and enforcement. Obstacles that hinder turning formal policy (promoting sustainability) into action are no doubt reflective of underlying conditions related to the customary use of turtles, and newer values and modes of behavior that have become commonplace with recent changes in Palau over the past half century.

So prevalent have been these difficulties in establishing effective enforcement of sea turtle regulation in Palau and in other nations of Micronesia that when looking back after nearly twenty years, one can see how sea turtle management policy of the past has led to increasing problems in the present. A reviewer of the subsistence green turtle exemption issued for TT residents under the U.S. ESA in 1978 suggested in 1984 that "a subsistence harvest¹¹³ conducted in a traditional manner would not have a major impact upon the existing populations of green sea turtles"—while technically accurate in limited cases, this opinion failed to assess the impact of harvests for the purpose of subsistence conducted outside of this narrow definition¹¹⁴. Nonetheless, the exemption which existed from 1978 until 1994 is likely to have significantly contributed to the present depression of green turtle populations in Palau and elsewhere, simply by promoting the legitimacy of the continuation of direct-harvest practices at the risk of long-term population sustainability and viability.

DECIDING WHAT NEW MEASURES ARE NECESSARY

Results of this review point to a need for greater education and enforcement of existing and any future regulations. Without the *implementation* of new national policy—and concomitant local action, national support, and regional coordination—it appears likely to many that Palau's sea turtle populations will continue to decline or expire completely. While historical population levels of sea turtles are not known, detectable evidence and local observance of marked declines point to the need for increased management. Scaling up management will not only require additional financial commitments, but it must also entail new harvest restrictions that many Palauans may find disagreeable or un-preferable at best. However, regarding the protection of threatened species, Palau National law provides guidance for scaling up management with relationship to turtles and other threatened species of concern:

"It is the policy of the national government to foster the well-being of these [indigenous] plants and animals by whatever means necessary to prevent the extinction of any species or subspecies from our islands or the water surrounding them."
– the Palau Endangered Species Act (24 PNC §1003).

Preventing extinction of turtle populations "by whatever means necessary" will not be easy, as prudent measures would involve substantially or completely curtailing the direct take of all species until recovery to stable levels are confirmed. Information on which to base assessments of turtle population condition are critical, yet difficult to obtain in Palau because of many factors. Johannes (1986) identified this dilemma facing managers of turtle resources in countries like Palau:

"Therein lies a dilemma. The people of those islands on which turtles play a vital cultural role would suffer if turtles were denied them. But there will be no turtles left if harvest rates continue to accelerate. At what point does the survival

of a turtle stock dictate the implementation of [stricter] conservation measures that are painful to those who depend upon turtle?”

Identifying the exact “point” to which Johannes alludes has remained a complicated, but not un-addressable question. Managers have learned that not all resource management decisions like this one are easily solved by assessing qualitative data alone (even if available), and that there is a need to adequately consider uncertainties and potential ramifications of the situations at hand. Twelve years later, Johannes (1998) himself presented an answer to this question with the proposal of precautionary “data-less” management methods. By using a similar precautionary approach that would reduce standards in favor of more practical and available information, a case for increased management and conservation of Palau’s turtles would be based on 1) the learning from other parts of the world (of which there are many) in which sea turtle populations have severely declined or have been eliminated completely, and 2) the current situation and recent trends related to Palau’s sea turtle populations based on existing information.

In addition to the numerous accounts of sea turtle population decline throughout the world attributed to human-related causes, two new additions to the knowledge of sea turtle biology are relevant to turtle policy and resource management conditions in Palau. The first is the understanding that turtle populations may exist in “population groups” smaller than was previously believed. What is being learned though the science of genetics is that nesting populations breed in isolation of other nesting groups, meaning there is less mixing among some turtle populations. The implication of this finding means that once a nesting population is extinguished from Palau, it is unlikely that they will be replaced with nesting turtles from other populations (*e.g.*, once they are gone they may be literally gone forever). The second finding relates to the value of different ages of turtle relative to overall population reproduction and health. It is being learned that the value of adult, reproductive turtles, especially adult females, is far greater than that of other younger ages of turtles, including turtle eggs. Implications of this finding means that while it is important to protect turtles at all stages of development, including eggs and nesting beaches, it is of great importance to strictly protect reproductive adult females. This knowledge may provide insight to the current poor status of Palau’s sea

turtle populations, given that during the past fifty years larger adult turtles have been allowed to be legally harvested seven (7) months out of the year, while difficulties in enforcement has especially failed to mitigate illegal harvest of nesting females and harvest of adult turtles during the closed seasons. Given these, it is also demonstrated that the sustained harvest of adults (*e.g.*, such as in Seychelles) or eggs (*e.g.*, such as in Malaysia) can be profound contributing factors to the local extinction of turtle populations. These two findings should be considered fully when designing new turtle management policy for Palau.

TAKING ACTION

Fishermen and scientists alike sense that Palau’s sea turtle populations have declined and are facing a dubious future, with some even possibly facing local extinction. Rules and enforcement concerning sea turtles in Palau have been relatively lax up to the present, allowing for apparently unsustainable harvest during open seasons and with little threat of penalty or sanction for transgressors. Various measures to improve this condition have been listed in this document. While fishermen or resource managers in Palau may not know what historical turtle levels were actually like or what effective restoration goals should be, the direction needed for recovery and sustainability is very clear. It is now well known that sea turtle populations are very sensitive to impacts resulting from human harvest and other threats; the direct and continued harvest of adult turtles and eggs are two of the most serious of these. The limited use of turtles can continue without drastically impacting recovery, only if done in a very strict and controlled way. The surest way to maximize chances for recovery, however, is to ban all harvest of turtle completely until identified populations are regarded as stable and healthy enough to withstand a resumption of direct harvest.

Palau has a long tradition of harvesting and using turtles; yet many human practices in Palau (and elsewhere) are reducing the likelihood that these traditions will continue for the simple fact that turtles may no longer be present. The main issue in relation to sea turtle management in Palau has always been about the balance between turtle use and turtle conservation. To this date, recent evidence seems to indicate that existing weak regulation has enabled greater turtle take—a take that has begun to severely undermine the long-term sustainability of local turtle populations, as well

as local customary use. Increasing enforcement will not be easy, and will certainly involve sacrifices for many Palauans in present and future generations. Many of those who provided opinions indicated the importance of sea turtles in Palau and the desire for Palau to do the best it can—in terms of policy, education, and action—to ensure that turtles will continue

to be an integral part of Palau’s cultural and natural heritage. Finding the balance between use and conservation, between tradition and modern realities, is what many Palauans are hopeful for. This is likely to be a difficult path, however one that is necessary if turtles are to remain a viable element of Palauan society and its natural environment.

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¹ Threats in this review are defined as significant, human-related and/or natural influences having adverse effects with respect to the decline and otherwise imperilment of long-term survival of sea turtle populations, including any influences that may hinder recovery and/or stabilization of turtle population numbers.

² Some quotations included may have been modified for the sake of clarity.

³ No quantitative method for determining consensus on issues was applied during this study; instead, information was gathered by qualitative semi-structured interview and focus group techniques.

⁴ Barnett describes the use and regulation of turtles in Palau in the following way: “The custom is so well established that no common person would dare serve turtle without the chief’s permission. If he were fortunate enough to capture one, he presented it to a chief who rewarded him either some of its flesh or in some other acceptable way” (Barnet 1979:29).

⁵ Kramer 1967; Kubary 1885.

⁶ For example, the Japanese organized an extensive trade of turtles and turtle shell, exported to Japan prior to WW II, as indicated in export records (South Sea Bureau [1937] South Sea Fisheries [1940] translated by Masanami Izumi, South Pacific Commission [in PDMR, n.d.]).

⁷ Following U.S. occupation of the Islands in World War II, the United Nations in 1947 created the Trust Territory of the Pacific Islands (TTPI) with the U.S. as administering authority. The TTPI or TT consisted of Kosrae, Ponape (now Pohnpei), Truk (now Chuuk), and Yap (which now are the four states of the Federated States of Micronesia), Palau, the Marshall Islands, and the Northern Mariana Islands.

⁸ TT Regulation No. 3-49, Article II, Limitations on the Taking of Turtles.

⁹ Article 3 of the Trusteeship Agreement gave the United States as administrative authority full powers of legislation, administration and jurisdiction over the territory.

¹⁰ During the period of TT administration, the Limitations on the Taking of Turtles had only been modified in two ways: 1) the green turtle was specifically identified as a restricted species (earlier versions identified restricted turtles as “hawk’s bill or sea turtle”), and 2) minimum take sizes were specified by individual species and periodically increased over the life of the Limitations.

¹¹ “[W]hen the United States enters into a unilateral or bilateral agreement with other nations, there is the presumption that it will extend to the territories and possessions of the United States and the Trust Territory, if applicable to local conditions. 14 Whiteman

Digest of International Law at 49-50 (1963–71): see also Article XIV of the United Nations Trusteeship Agreement” (in U.S. Department of Interior 1975). Also see the 1981 Report to the United Nations on the Trust Territory of the Pacific Islands.

¹² See U.S. Federal Regulation 50 CFR17.11 for more information.

¹³ “Subsistence” take is identified within the U.S. Federal Regulation as the take for personal consumption if such activity was “customary, traditional, and necessary for the sustenance of such resident and his immediate family” (Federal Regulation 32800 (f) Subsistence as quoted by Lecky and Nita: 1985 p. 15, in McCoy 1997).

¹⁴ Related to the regulatory subsistence exemption of the U.S. ESA, it is described in NMFS and USFWS 1998b page 11 that “only green turtles less than 30 inches could be legally taken and only from below the high tide mark and for non-commercial sustenance purposes”. If the information in NMFS and USFWS 1998b is correct, this exemption would appear to apply a different rule (protection of larger turtles) with respect to size limitations than the continuum of TT-derived Limitations (protection of smaller turtles). The extent to which the U.S. ESA exemption and its apparent restriction conflicted with variations TT Limitations is unknown (e.g., if minimum and maximum size restrictions were equally in force and effect at the same time and at any time overlapped in size limitations, they would have legally eliminated any authorized take of green turtle in the TT).

¹⁵ Regarding the continuation of existing laws, the Palau Constitution states that “[a]ll existing law in force and effect in Palau immediately preceding the effective date of this constitution shall, subject to the provision of the constitution, remain in force and effect until repealed, revoked, amended or until it expires by its own terms” (Palau Constitution, Article XV, Section 3[A]). Section 301 of the Palau National Code (PNC) also gives the effect of law in Palau to, among others, Laws of the Trust Territory and amendments to them, to the extent they have not been repealed by the Olbiil Era Kelulau (OEK).

¹⁶ As a Trust Territory official acknowledged, “there had been no enforcement of the existing regulations governing the taking of turtles or their eggs” (Wilson 1969: 692 in McCoy 1997). Also see Owen 1978 and Geermans 1992.

¹⁷ Additionally, it was indicated that foreign fishermen at remote sites in Micronesia were suspected of

poaching “hundreds, if not thousands of green turtles every year from nesting islands...” (Owen 1978).

¹⁸ See U.S. Department of Interior 1975; U.S. Department of Interior 1993; Anonymous 1991.

¹⁹ Examples of attempts by the U.S. Government to enforce Sections of the U.S. ESA related to turtle include the confiscation of turtle shell products being offered for commercial sale and the denial of permits for mariculture facilities (USFWS 1992). The U.S. Fish and Wildlife Service (FWS) also proposed registration forms for the traditional use of pre-existing turtle shell cultural items, e.g., *toluk* [0] (see Anonymous 1991).

²⁰ At various times both the U.S. Peace Corps and the Japanese Tortoiseshell Association assisted the operation of a hawksbill sea turtle mariculture facility within the Palau Division of Marine Resources as a management and conservation tool. More information on the operation and closure of this facility can be found in Donnelly (1994) and Maragos (1992).

²¹ Throughout this review, when the word “customary” relates to turtle use or other practices, it implies any preexisting use or practice, regardless of its period, duration, or its association with the contemporary. In this sense, the use of “customary” in this review refers to any activity or practice that is a usual, habitual, or established way of doing things, reinforced by tradition and/or social attitudes. In this regard, the taking of eggs with the assistance of motorboats, for example, is regarded as a “customary” activity with all its components (*i.e.*, motorized transportation) because this action has been occurring regularly regardless of its origin. The word “Custom”, when capitalized and in quotation marks, is used to designate any formalized social event or ceremony occurring in Palau with some degree of cultural tradition. Among “Custom” events are considered funerals, first-birth ceremonies, and house parties. The use of the word “traditional” in this review is closely related to the word “customary”, however is reserved for long-standing customary practices that can be linked through generations and close associations of culture. Of course, there are many definitions and applications of these words in common language and usage.

²² Michael Rosenthal, Palau Minister of Justice, personal communication, May 2001.

²³ Especially relevant to this concern is the Palau Endangered Species Act.

²⁴ Although the goal of sustainability is not mentioned in national legislation related to turtles, it is assumed that, generally, sustainability was one of the impetuses

for the creation of regulation.

²⁵ For example, all government powers not expressly delegated by the Constitution to the States nor denied to the national government are powers of the national government. While the Constitution and national laws passed by the OEK prevail over State laws, there are many cases where this ranking becomes unclear in practical matters (see Graham 1998) and may need to be further addressed by the Palau courts.

²⁶ Used as a guide for the meaning of “fishing” related to turtles, the Palau National Code 27 PNCA §1203, states that “fish” as a noun, means any species of animal, other than birds, which lives in the sea. Likewise “to fish” means to catch, take, or harvest fish, or to attempt to take, catch, or harvest fish using any method what so ever.

²⁷ Adapted from a fact sheet entitled “Conservation Areas of Palau,” produced by the Palau Conservation Society, printed 11/2000.

²⁸ A difference in relative consumption of turtle products is expected to vary according to location, culture, income, and other factors, as has been identified in previous reviews, *e.g.*, Johannes 1986. For example, it is expected that people living in remote areas will consume a greater percentage of turtle in their diet due to the unavailability of other meat sources. It may also be expected that individuals from lower income households consume a greater percentage of caught turtle as an alternative to store bought foods. Additionally, it has been indicated in many consultations that it is the wealthier households (based in urban centers) that can afford to purchase turtle and do so to a greater degree than those with lower incomes.

²⁹ Exceptions could be situations of extreme famine combined with prolonged rough ocean conditions in remote areas. However, these situations are an unlikely probability in contemporary times.

³⁰ “Nobody dies if you don’t serve it.” Personal communication, Kathy Kesolei, July 2000.

³¹ For example, the legend of the two lovers and nesting turtle of Ngemelis Island, and numerous others.

³² As supported by previously reported information.

³³ An important exception to this finding was offered by respondents who recounted of a visit to Angaur where many children expressed a high liking of turtle meat.

³⁴ Differences between spiritual and other non-religious cultural uses are sometimes not readily apparent and are often difficult to distinguish. Cultural practices related to broad cultural functions not

specifically religious are addressed in the section on cultural ceremonial use.

³⁵ The Palau Society of Historians (1997:59) describes an historical indigenous religious practice of eating turtle meat as a means to “release” illnesses caused in humans by gods.

³⁶ One of the ceremonial practices attributed to the indigenous *Modekngai* religion involved the burning of turtle meat as an offering to their deity on special offering days, a practice that was indicated to occur in the 1950s (Tobin *et al.* 1961). The *Modekngai* religious group makes up roughly 11% of the 11,808 Palauans who claim affiliation with a religious organization (1995 Palau Census Report, Table 10). The degree to which this practice is continued today is unknown. No information solicited during the course of these consultations indicated the practice of this ritual; however, this does not mean that the practice of this particular ritual no longer occurs.

³⁷ Examples include the turtle associated with the female god of Peleliu, that wears a necklace and has certain powers.

³⁸ Similar results on extant taboos indicated by Johannes (1986).

³⁹ The people of Palau consider *toluk* and *chesiuch* to be “*udoud era redil*” or women’s money. (Ngerbeched women’s consultation group).

⁴⁰ However, due to the special significance of sea turtles, turtle meat could be reserved at a social function for special persons and guests. Johannes (1986) provides indications of former occasions when the use of turtle was authorized and regulated by individuals of high status and rank in Palau and Southwest Islands communities.

⁴¹ Information from one respondent.

⁴² Data necessary to produce similar annual harvest level estimates for hawksbill turtle were not sufficiently reliable, hence they were omitted.

⁴³ Similar estimates for green turtle egg harvest were also problematic to deduce and hence omitted.

⁴⁴ Scutes, as used here, are the individual plates or hard scales of turtle shell.

⁴⁵ For example, it is commonly reported that the ratio of *toluk* units paid for service has changed over past decades. This trend is attributed to economic factors of decreasing value in newly made *toluk*, ever-increasing *toluk* numbers in circulation, changes in human demographics, and other social influences.

⁴⁶ Personal communication provided by *Bilung* Gloria Salii, July 2000.

⁴⁷ This and other recorded information concerning perceptions and observations relative to density, abundance, or status of sea turtles (or any other resource), may very well be affected by “shifting baseline syndrome” (Pauly 1995; Sheppard 1995), which relates to the age and relative experience of the informant (see Appendix 1).

⁴⁸ For example, it is indicated that the “take of eggs is increasing...because everyone is taking them, [because] everyone has boats now” (Ngerbeched women).

⁴⁹ Without full knowledge of, or access to, comprehensive information on sea turtle biology and overall threats to turtles, it is expected that some individuals may not be adequately prepared to provide informed responses to queries of this nature.

⁵⁰ Especially in the case of hawksbill turtles: “The commercialization of turtle shells is depleting *ngasech* numbers” (Ngiwal Fishermen).

⁵¹ In the words of one respondent: “they are also beginning to sell them. I know that when the field trip goes and comes back, there is something like twenty to thirty turtles on board at one time” (Koror Fisherman).

⁵² The financial benefits of turtle hunting have drawn increasing numbers of young men from Sonsorol, living in Koror, who travel to Merir for the specific purpose of harvesting sea turtles. These captured turtles are subsequently transported aboard field trip vessels and sold to meet Koror’s growing market demand.

⁵³ A comment on the increasing commercialization of hawksbill shell: “Everyone in Koror is after hawksbill shell. Before each trip to the Southwest Islands, usually ten or more people are asking for hawksbill turtles, and offering cash for turtle shell brought back” (State Government Official).

⁵⁴ A comment that suggests the unnecessary need to create new *toluk*: “But there is enough because they are exchanged so they go around and around” (Ngerbeched women’s consultation group).

⁵⁵ “Nevertheless, older Palauan fishermen appeared unanimous in their opinion that turtles were far less abundant than they had been ten to twenty (10–20) years before, with a decrease in the numbers of large green turtles being especially noticeable” (Johannes 1986: 9).

⁵⁶ Reference to concern over turtle decline in Palau is mentioned in numerous reviews and documents. See Appendix 1 for a list and a review of these sources.

⁵⁷ It is important to note that over the entire course of

this study, not one individual consistently expressed a belief that sea turtle populations were increasing over a significant portion of time. Other respondents indicated that on occasion during a particular month or season they saw more turtles than usual, but that these events were not sustained and are believed to be the result of characteristic population fluctuations related to migratory patterns.

⁵⁸ This assessment of perception does not distinguish among different populations of foraging or nesting turtles of the same species.

⁵⁹ Time comparisons for this study were limited to the past 20–40 years.

⁶⁰ An indication of a decreasing catch-per-unit-effort (CPUE).

⁶¹ Some quantitative nesting data exists for the Rock Island hawksbills. However, because of its short-term nature, it is of little use for making meaningful comparisons to previous years or for analyzing long-term trends (see Appendix 1).

⁶² Concern over declining numbers has motivated the construction of a mariculture facility in Merir Island to be used as a sea turtle hatchery and headstarting program.

⁶³ When only small-size carapaces can be harvested for the making of *toluk*, it becomes logical to conclude that large hawksbill specimens, which are the most sought-after for *toluk* making and the only ones able to reproduce, have become rare. Such a condition has clear ramifications: The reproduction of a population of mostly sexually immature individuals becomes highly limited because even if those few sexually mature individual were able to escape being harvested, the rate of replenishment would still be very low given the relative scarcity of their numbers.

⁶⁴ In order to assess effectiveness of regulations, an indication of legislative purpose is necessary. Since there is no mention of a legislative purpose within existing national turtle regulations (24 PNCA 1201), it was assumed, for purposes of these consultations, that the goal and purpose of these regulations are to ensure population sustainability, and to prevent the overharvest of turtle populations while at the same time allow for a degree of subsistence use of sea turtles.

⁶⁵ A test of this aspect of the regulations’ effectiveness would be to ask: “Supposing regulations, as currently written, were enforced and complied with one hundred percent, would they be sufficiently effective to allow for the maintenance of sustainable populations of sea turtles in Palau?”

⁶⁶ For examples of recommendations related to turtle size, see summary of Section 4.5.3. Change Size Limit.

⁶⁷ Adalbert Eledui, Koror State Government, personal communication, May 2001.

⁶⁸ Conclusive analyses of nesting population viability have yet to be conducted due to a lack of basic information. However a predominance of anecdotal information suggests declines in nesting in many locations of Palau.

⁶⁹ According to current estimates, sea turtles do not achieve sexual maturity until twenty to fifty (20–50) years of age (SPREP Sea Turtle Brochure, circa 1995).

⁷⁰ Examples of nesting population depletions used during stakeholder consultations were suggested through personal communication with George Balazs and Colin Limpus, June 2000.

⁷¹ For example, it is important to recognize that sea turtle population declines in Palau are most likely the combined result of impacts taking place over a wide geographical area, an area that extends beyond Palau and encompasses all regions in which Palau's turtle populations migrate, forage and/or nest.

⁷² It is noteworthy to mention that some if not most of the information requirements suggested in the Recovery Plans for U.S. Pacific Sea Turtle Populations (NMFS and USFWS 1998a and b for example) are beyond the immediate (or even foreseeable future means) of many Pacific Island nations, including the Republic of Palau. The fact that all desired information may not be attainable in the near future (or at any time) should be considered in the development of present management and information gathering strategies. The immediate lack of information needed to operationalize these standards should not be viewed as an obstacle to meaningful management action that can be presently taken.

⁷³ It is clear that the narrative provided in this document cannot attempt to express the completeness of associations between sea turtles and the concepts of tradition and culture in contemporary Palau. However, an example is presented to indicate an aspect of the valued cultural connection between Palauan traditional customs and Palau's sea turtles: recently as of May 2001, some residents of Peleliu have required that only locally grown or locally captured foods be served at customary functions, as a means of regaining and/or retaining traditional practices and values. The serving of turtle at these functions is common; an act that is viewed as a strengthening link to tradition (Judy Otto, Palau Conservation Society, personal

communication, May 2001).

⁷⁴ For example, on Peleliu it has been explained that a growing, primary reason for young men hunt turtles is for sport and entertainment (see also Johannes 1986). This purpose, it was suggested, tended to alter customary use patterns by providing turtle meat on random occasions, rather than for specified events or for chosen uses, as might have occurred within traditional contexts. Without particular functions or events scheduled, turtle meat is hastily sold or frozen for personal use at a later time. This practice, along with its changing social context contributed to the increase in the overall turtle harvest, as well as, to the decrease in local turtle population (unidentified Peleliu fisherman, personal communication, 1996).

⁷⁵ Examples of such events include a Constitutional Day celebration on July 9th, 2001, in which guests were openly served turtle meat, during closed season, in the presence of government officials and employees.

⁷⁶ Personal communication with Kammen Chin, Chief of the Division of Conservation and Entomology, May, 2001.

⁷⁷ See U.S. Pacific Sea Turtle Recovery Plans (NMFS and USFWS 1998 a and b) for a detailed description of these considerations.

⁷⁸ The only migration information that exist for Rock Island Hawksbills is from captive raised or "head-started" sea turtles (See Sato 1991).

⁷⁹ Should the nesting Rock Island hawksbill population be found to be reproductively (genetically) isolated from adjacent breeding groups in the region, as it may very well be the case, the actual viability of the Rock Island population is likely to be reduced to a level much lower than previously believed. Genetic analyses of Rock Island nesting hawksbills and nesting turtles from adjacent rookeries can help answer this question. At present, until the level of isolation is determined, it is prudent to treat the Rock Island nesting hawksbill population as an isolated, and hence, individual management unit.

⁸⁰ Based on the findings of Maragos (1992) and on public consultations conducted for this review.

⁸¹ "Customary practices" in this model refers to those activities considered traditional and/or routinely practiced over the past half century, outside of commercial activities.

⁸² For example, Owens (1978) reports the "sharp decline in at least the export of tortoise shell items because of conservation law enforcement activities within Micronesia", with the enactment of the U.S.

and TT endangered species Acts. Maragos (1992) indicated that the sale of turtle shell products had been effectively controlled during a period prior to the preparation of a draft sea turtle management plan for Palau in 1992.

⁸³ This increase has occurred despite the fact that hawksbill turtles were once afforded protection in Palau under the TT Endangered Species Act of 1975, which was adopted into Palau law, and which may—depending on the interpretation of the Palau Constitution and status of pre-existing regulations associated with TT laws—effectively prohibit the possession, sale, and export of all hawksbill shell products in Palau. See footnote 95 for additional information.

⁸⁴ George Market remains the largest retailer of hawksbill turtle shell products in Palau. Results from a 1999 retail survey by K. Weng (September, 1999; unpublished) indicate the following approximate numbers and prices of turtle shell items for sale at George Market: 350 bracelets at \$10–\$30 each for larger bracelets, \$8 for smaller bracelets; 5 pendants at \$50 each; 200 rings at \$5 each; 16 earrings \$12 pair; 1 belt (not priced); 18 hair combs at \$20 each; 57 barrettes at \$20 each. The estimated retail value of these approximately 650 turtle shell items exceeded \$7,000 USD.

⁸⁵ Appendix I lists species that are the most endangered among CITES-listed animals and plants—those that are considered to be threatened with extinction. CITES generally prohibits commercial international trade in specimens of these species; however trade may be allowed under exceptional circumstances, *e.g.*, for scientific research. In these cases, trade may be authorized by the granting of both an export permit (or re-export certificate) and an import permit. Appendix II lists species that are not necessarily threatened with extinction at present time, but that may become so unless trade is closely controlled. International trade in specimens of Appendix II species may be authorized by the granting of an export permit or re-export certificate; no import permit is necessary. Permits or certificates should only be granted if the relevant authorities are satisfied that certain conditions are met. The most important of these conditions are that international trade will not be detrimental to the survival of the species in the wild (adapted from the CITES website: <http://www.cites.org/>, November 2000).

⁸⁶ Migratory species listed in CMS Appendix I are considered in danger of extinction throughout all or a sig-

nificant portion of their range. Parties that are Range States of a migratory species listed in Appendix I commit to take appropriate and reasonable action to conserve these species within their territorial boundaries. Migratory species listed in CMS Appendix II are considered to have an unfavorable conservation status and which require international agreements for their conservation and management, as well as those species which would significantly benefit from the international cooperation that could be achieved by an international agreement. Parties that are Range States of migratory species listed in Appendix II commit to conclude Agreements where these should benefit the species and should give priority to those species in an unfavorable conservation status (adapted from the CMS website: <http://www.wcmc.org.uk/cms/>, November 2000).

⁸⁷ Additional international protection of the hawksbill sea turtle is afforded by the SPAW Protocol (Specially Protected Areas and Wildlife) of the Cartagena Convention and the Inter-American Convention for the Protection and Conservation of Sea Turtles.

⁸⁸ In the mid-seventies, Prichard (1977) suggested that Merir and Helen Islands were two of the most important green turtle nesting sites in all of the U.S. TT.

⁸⁹ “Customary Practices” in this model refers to those activities considered traditional and/or routinely practiced over the past half century, outside of commercial activities.

⁹⁰ Assuming a 50% compliance of national regulations during closed seasons. For example a 150/month harvest estimate during open season is converted to a 75/month closed season harvest estimate.

⁹¹ Compare with: “About twenty (20) turtles are harvested a month during open season” (Ngiwal Fishermen Consultation Group).

⁹² For contrast, fifteen years ago, Bob Johannes reported witnessing four (4) turtles captured during fourteen (14) months of residency in Palau, most of that time spent in Ngaremlengui (Johannes 1986).

⁹³ Another estimate derived from other consultations suggested that there are approximately “50 serious turtle hunters in the main islands, and that each take roughly 3 turtles per month in the open seasons” (Koror fisherman, July 2000). The resulting calculation leads to a similar estimate: 1050 turtles captured during the open season in the main islands (50 fishermen × 3 turtles/month × 7 open months).

⁹⁴ Estimated frequency of foreign poaching is independent of open and closed turtle harvest seasons.

⁹⁵ As was mentioned previously, when green turtles were listed under the U.S. ESA in 1978, a provision was included for their subsistence use by native peoples of the U.S. Trust Territory of the Pacific Islands (USFWS 1998b:11). However, a similar exemption for the traditional or subsistence use of hawksbill turtle was not issued. The condition of an exemption for one popular species and not another may have led to confusion concerning the turtle management and protection from the years of 1978 to 1994. Additionally, potential misunderstanding of the overlap of various statutes and regulations and the mechanisms by which they were to operate (*e.g.*, did the U.S. ESA exemption granted to TT citizens for the subsistence take of green turtle apply year around, or was it subject to existing TT/Palau turtle regulations as well?) likely confused issues further.

⁹⁶ Benefits from a use perspective include allowances for the traditional and subsistence use of turtle during part of the year, regarded as valuable customary practices. From a management and population survival perspective, direct harvest is a primary threat to Palauan turtle populations and any form of directed take at this apparently perilous stage is likely to hamper future recovery and further endanger populations—including critical nesting populations.

⁹⁷ Under conditions similar to those of Palau, many sea turtle biologists identify adult turtles, especially nesting females, as the most critical individuals to protect within depressed populations (see Appendix 2 for more detail on this issue).

⁹⁸ While Palau-specific species list and regulations under the Palau-ESA have been proposed but yet to be adopted (see Anonymous 2001), TT-era regulations (and species list), to the Endangered Species Act of 1975, existed and applied to all Micronesian TT districts (Territorial Register 1976). If this preexisting list was afforded the same force and effect of law (as stated in 45 TTC Section 108), it is conceivable to construct an argument that since the Palau Minister of Resources and Development has yet to issue regulations to Palau's ESA under 24 PNCA 1006, the TT-era regulations may still be applicable to Palau (following Article XV s.3,10 of the Palau Constitution). This would include all species included in the regulation's list applicable to Palau (*e.g.*, hawksbill turtle). This issue surrounding the existence of a TT-era endangered species list and its application to Palau has been informally discussed among local resource management and legal agencies (Thomas Graham, personal

communication 2001), however this subject should be legally and officially clarified.

⁹⁹ The protection of populations of nesting turtles, their eggs, and nesting habitat in Palau is necessary. However, this alone is not sufficient to ensure long-term survival. This is especially true in light of the fact that turtle harvest and other threats in other countries also imperil these same populations that nest in Palau. A successful sea turtle conservation policy can only be complete if measures are taken to protect all turtle populations found in Palau regardless of where they nest. Furthermore, the nature of turtle populations' extensive migratory patterns dictates the need for a multi-national management program that involves all resource-sharing nations.

¹⁰⁰ The Convention on Biological Diversity's precautionary approach and methodology is adapted from procedures established in other international fora, including the practice of the 1980 Convention on the Conservation of Antarctic Marine Living Resources, the 1995 UN Agreement on High Migratory Fish Stocks and Straddling Fish Stocks, as well as the proceedings of the Lysekil Workshop (FAO Fisheries Technical Paper 350/1: 1995), which sets guidelines for the application of the precautionary approach to capture fisheries (adapted from the Convention on Biological Diversity website: <http://www.biodiv.org/>, November 2000).

¹⁰¹ Objective and actions adapted from the "Step-down Outline and Narrative for Recovery" found in the Recovery Plans for U.S. Pacific Sea Turtle Populations (see NMFS and USFWS 1998b: 51 for examples).

¹⁰² Examples of partnerships could include state, national, and private sector (tour guide) surveillance of hawksbill nesting on Rock Island beaches. Other partnerships for collaborating on such a task could be science tourism groups, such as an Earthwatch-type program, or non-government conservation organizations.

¹⁰³ This includes policy that addresses the need for international cooperation in management of shared sea turtle resources.

¹⁰⁴ Palauan women generally agree that no new *toluk* is needed (especially when considering the precarious current status of nesting hawksbill populations) so long as existing pieces can remain in circulation.

¹⁰⁵ Justification for this limitation is that female turtles are more likely to be overexploited in Palau than their male counterparts mainly for two reasons: 1) females are easily captured on nesting beaches, and 2) they are

a preferred target due to their high fat content, and the possibility that they may carry eggs. The replenishment of these depleted populations is more likely to take place if the protection of the females is made a priority over that of the males. Since only females can lay eggs and a single male turtle can mate with several females, the number of female turtles is the most limiting factor of reproduction within a given population, and hence the most critical to protect. This recommendation, however, is not to be misinterpreted to suggest that no restrictions are needed with respect to the harvesting of males; precautionary measures should be also taken to prevent the overexploitation of males as well, and to maintain critical sex-ratios within populations.

¹⁰⁶ Such capture methods will ensure that if taken turtles do not meet restriction requirements, they can be released unharmed. Currently, many fishermen use spearing as a preferred hunting technique, which can lethally or otherwise injure a sea turtle. To not employ spearing or other harmful hunting techniques will mean that when a mistake is made in targeting and capturing a prohibited turtle, that the turtle in question can be released unharmed.

¹⁰⁷ These mechanisms could include zoning or development standards for identified nesting beaches.

¹⁰⁸ While these recovery standards are included as a guide for developing management strategies, it is recognized that additional information and expert judgment will be needed before such standards can become operational. Some of this information may be difficult, if not impossible, to gather within reasonable time-frames due to practical constraints; hence, “data-less” approaches are recommended to supplement these standards.

¹⁰⁹ These could include zoning or development standards for identified nesting beaches.

¹¹⁰ Stage-based population models (Crouse *et al.* 1987) point out several unique characteristics of the life-and reproductive-cycle of sea turtles: 1) the ratio of hatchlings born to those that reach sexual maturity is estimated to be in the thousands, 2) a sea turtle takes two to five decades before it is able to reach sexual maturity, and 3) a female sea turtle must nest many years before it can ensure that it will have a successful offspring to take its place in the population. These unique species characteristics underscore the importance of affording higher levels of protection to adult female turtles.

¹¹¹ Difficulties with enforcing this Option 3 include, 1) ambiguities in determining and interpreting the concept of “subsistence use”, 2) problems discerning the difference between recreational fishing and use, and subsistence fishing and use, 3) that possession of turtle would be legal, and 4) that the only way to ascertain a violation would be limited to catching perpetrators in the act of an improper use (*e.g.*, exchanging turtle or turtle products for cash).

¹¹² These include organization such as the U.S. National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (FWS), SPREP Marine Turtle Research and Conservation Program, IUCN Species Survival Commission’s Marine Turtle Specialist Group, Convention on International Trade in Endangered Species (CITES), Convention on Migratory Species (CMS), and other non-government organization (NGO), universities and foundations.

¹¹³ The implied definition of subsistence harvest used here is: the customary and traditional taking of turtle necessary for the sustenance of a resident of the Trust Territory and his immediate family (Farrell 1984:15)

¹¹⁴ Realization of actual conditions of turtle use and enforcement would have concluded against such a position.

APPENDIX 1

REVIEW OF EXISTING MATERIALS AND INFORMATION RELATIVE TO PALAU SEA TURTLE POPULATIONS, MANAGEMENT, AND POLICY

This appendix provides an appraisal of published and unpublished information relevant to sea turtle status, research, management, and policy in the Republic of Palau. This synopsis includes the review of references, summaries of relevant research information, and recommendations that may be useful in the formulation of new policy and activities to enhance the management of sea turtles in Palau¹.

This review is organized into three sections:

1. The *State of Knowledge of Palau's Sea Turtles* is a summary of current knowledge and research on Palau's sea turtle populations.
2. The *Topical Research Reports, Surveys, and Project Reviews* contains findings of specific research, surveys, and project reviews.
3. The *Assessments, Status Reports, Recovery and Management Plans, and Recommendations* is a summary of broader status assessments and management recommendations.

1. STATE OF KNOWLEDGE: RECENT RESEARCH AND INFORMATION ON PALAU SEA TURTLES

Limited contemporary turtle research and monitoring has taken place in Palau since the late 1960s. Palau-based published data, results, and other scientific information on sea turtles, however, is meager relative to other countries with extensive and long-term sea turtle research, monitoring, and management programs. Contributing to this condition in Palau are the following: 1) the generally low priority of ecological research and monitoring in comparison to other public services, 2) the cost and difficulty typically associated with long-term research and monitoring of sea turtle populations, and 3), the limited number of practitioners and professionals within the Republic who possess necessary training, expertise, and capacity to undertake such research. In spite of this condition, the knowledge and observations of fishermen and of those intimately connected with marine resources, offer an important context for anecdotal information² on sea turtles, which remains

to be an important indicator of changes in sea turtle populations. Anecdotal information, together with the developing body of documentation on the biology, distribution, nesting, and use of sea turtles in Palau and within the region, provides significant and practical information which may be formative in the enhancement of management efforts in the Republic of Palau.

Anecdotal Information on Palauan Sea Turtle Populations

Fishermen, divers, and beach observers in Palau are repositories of key information on the trends and fluxes of marine resources, including local sea turtle populations³. Anecdotal information from individual sightings, repeated observations, and local expert knowledge of turtles, is the predominant form of information available on Palau's sea turtles. However, this collective knowledge is widely dispersed and not readily accessible to public managers and decision makers. Nor are these observations easily standardized or tracked over time. Summaries of Palauan turtle distributions using such sources have been published in reviews providing information on relative status of turtles; however, very little, if any, of this information is usually quantified beyond general statements or broad classifications. While this may be some of the most readily available information, those who rely on this information must be aware of its limitations, such as shifting personal baselines from which perceptions are generated⁴. Regarding cultural uses and management, many authors have described Palauan and Western Carolinean practices related to turtles⁵.

Field Surveys, Monitoring, and Other Forms of Research on Palauan Sea Turtle Populations

There has been a limited amount of information systematically gathered and/or recorded on Palau's sea turtles over the past two decades. Monitoring of nesting beaches, surveys, and experimental conservation

efforts (*i.e.*, mariculture efforts for stock replenishment), have contributed to the current understanding of local sea turtle populations. However, all record keeping activities have occurred intermittently and inconsistently, making it difficult for local experts to scientifically appraise current stock levels, trends and/or population viabilities. Valuable information of primary concern to management interests—including current harvest levels, enforcement effectiveness, estimates of foraging and nesting populations, the extent of migrations, and genetic composition—remain sporadic, incomplete or non-existent.

Readily available recorded information on Palauan nesting sea turtles dates back to the Japanese administration in the Southern Seas, during which marine resource exports were recorded⁶. Additional sea turtle information was made available with the initiation of the Micronesia Mariculture Demonstration Center's (now the Palau Mariculture Demonstration Center) Hawksbill Sea Turtle Mariculture Project in 1982⁷. This Japanese-funded project involved collecting nesting beach data on Rock Island hawksbill turtles and simultaneous sea turtle mariculture activities that lasted from 1982 to 1992. Records from this effort, which relocated hawksbill eggs from nesting beaches and recorded levels of suspected poaching on a nearly weekly or bi-weekly basis, remain the largest, longest running data set on Palauan sea turtle nesting (summarized in Maragos 1992). Juvenile turtles released from the facility were flipper-tagged for future identification and provided a few recapture events (Sato and Madriasau 1991). Nightly monitoring of nesting hawksbills in the Rock Islands in 1992 and 1994, provided additional information on hawksbill nesting and frequency (Atkinson and Guilbeaux 1992; Guilbeaux, Davis and Tonne 1994). Green sea turtle nesting populations have been described by a multiple-night tagging surveys on Merir Island in 1992 (Geermans 1992), on other Palau beaches (Kayangel to Angaur) during various one-day or night surveys of nesting crawls (Geermans n.d.; Guilbeaux 1995), and on Helen Island for 22 days over two time spans in 2000 (Birkeland *et al.* in prep.). Aerial observations of swimming turtles, presumed to be green turtles, were recorded during a dugong survey in 1991 (Marsh *et al.* 1992). Information on the commercial sale of sea turtle products has been collected as part of market surveys undertaken in 1999 (Weng, Loscalzo, and Guilbeaux, in prep). Satellite migration studies of hawksbill and green turtles are currently underway.

To address the need for reliable, relevant, and standardized information on the status of sea turtles in Palau, many reports and plans have suggested the initiation of research and/or monitoring programs for sea turtle populations within the Republic and the region. As with any future project or program focused on the gathering of information on sea turtles, an important criteria for its implementation will be the value of benefits of such information for management and general knowledge, contrasted with the level of financial costs, coordination, and support required for such activities (*e.g.*, some management actions can be taken without additional information; some stakeholders may require relevant information before accepting or supporting management decisions)⁸.

2. TOPICAL RESEARCH REPORTS, SURVEYS, AND PROJECT REVIEWS

Summaries of documented research, surveys, and/or monitoring are provided below in chronological order from 1987.

Milliken, T. and H. Tokunaga. 1987. *Observations of the Hawksbill Sea Turtle Head-start Program at the Micronesia Mariculture Demonstration Center (MMDC), Koror, Palau, October 1986. Traffic Japan, Tokyo, June 1987.*

This work includes an evaluation of MMDC "Headstart" program, particularly from the standpoint of CITES certification; sections on the status of hawksbills in Palau; a description of the MMDC hatchery; methods of hatchery operation; related discussion, and recommendations. Summarized are hawksbill nesting records in the Rock Islands, from 1981 to October, 1986, including nesting locations, seasonality, nesting levels, clutch size, collection effort, and percent of nests believed to be poached. This report cautions that "headstarting" of sea turtles should be regarded as an experimental approach and not as a sufficiently proven conservation method that can address the major threats facing the Palauan hawksbill. Estimations of the total number of hawksbill nests are given at one hundred and twenty to one hundred and eighty (120–180) per year. Estimates of nest removal also indicate that unauthorized and authorized egg collection may exceeded ninety percent (90%) of all the nests laid in Palau. Included are recommendations to improve records, protect a

greater proportion of nests in-site in the Rock Islands through patrols and enforcement, and the initiation of an education and public awareness program.

Sone, S. nd. *Research of the Hawksbill Sea Turtle Head-Start Program at the Micronesian Mariculture Demonstration Center (MMDC), Koror Palau in 1987 and 1988.* Japan Tortoise Shell Association. Unpublished (Tables and Figures), 4pp.

Not reviewed.

Sato, F. 1991. *Application Plan for the U.S. Endangered Species Act.* Prepared by JICA for the MMDC Turtle Project. November 1991.

In addition to describing the MMDC headstart turtle project, this text includes a list and data of tag recaptures from hawksbill turtles raised from eggs and released from the MMDC facility. Recapture locations and frequencies include one (1) recovery in Guam, three (3) in the Philippines and four (4) in the islands of Palau.

Sato, F. and B. Madriasau. 1991. *Preliminary Report on Natural Reproduction of Hawksbill Sea Turtles in Palau.* Marine Turtle Newsletter. 55: 12–14.

Not reviewed.

Marsh, H. et al. 1992. *An Assessment of the Status of Dugongs in Palau, Including Comments on Sea Turtles.* A report to the Ministry of National Resources, Republic of Palau. March 1992.

This report provides quantitative open ocean observations of foraging sea turtles incidental to Palau dugong aerial survey⁹. Although no nesting beach observations are included, it may provide reference to patterns of sea turtle distribution in the Palau islands; however, results should be considered within limitations of survey method, e.g., possible seasonality effects, observational constraints, etc.

Geermans, S.H. 1992. *Marine Turtles of the Southwest Palau Islands.* A report to The Nature Conservancy, Asia-Pacific Program for the Republic of Palau Rapid Ecological Assessment (REA).

This report summarizes a natural resource assessment in the Palau Southwest Islands, which included nesting beach surveys at Tobi, Helen Reef, Sonsorol, Pulo Anna, Fanna, and Merir. It records nesting turtles tagged at Merir and Helen Reef, as well as free-ranging turtles captured at Helen, and turtles tagged by islanders on Merir in 1991¹⁰. Clutch size and egg characteristics are also included as are estimates on nesting and harvest. Estimates range from fifty to one hundred and fifty (50–150) green turtles nesting annually on Merir, and eighty to one hundred and ninety (80–190) nesting annually for all of the SW Islands. The report contains no mention of observations of fibropapilloma in green turtles during the expedition. It reports no nesting of hawksbill turtles in the Palau SW Islands¹¹, and a lack of compliance with and enforcement of sea turtle regulations. Information provided to Palau REA (1994) and Draft Sea Turtle Recovery Plan comes from Maragos (1992). Tag numbers were reported to SPREP Regional Marine Turtle Research and Conservation Program. Key findings were that estimations for the population of turtles nesting on Merir published for the first time were much lower than previously known or believed.

Atkinson, S. and M. D. Guilbeaux. 1992. *Assessment of Preliminary Nesting Hawksbill Sea Turtle Survey within the Rock Islands of Palau.* Report prepared for the Division of Marine Resources, ROP by the Georgia Sea Turtle Cooperative, 5pp.

This pilot study of nighttime nesting hawksbill monitoring in the Rock Islands reports on the nightly monitoring of fourteen (14) nesting beaches in three island groups (Ngerukewid, Kmekumer and Omekang) for twenty five (25) field days through June 16 to July 28, 1992. It provides information on hawksbill nesting density, demonstrated utility of disguising nests, and the feasibility, conditions, and value of intensive nighttime monitoring in the Rock Islands.

Geermans, S.H. 1993. *Marine Turtles, Sea Birds and Micronesian Megapodes of Babeldaob, Peleliu and Ngemelis.* Summary Report. Submitted as part of Maragos, J. E. 1994. *Marine and Coastal Areas Survey of the Main Palau Islands: Part 2. Rapid Ecological Assessment Synthesis Report.* Prepared for the Palau Bureau of Natural Resources and Development by The Nature Conservancy. Maragos, J. E. ed.

This survey reports the results of surveys and rankings of various beaches along the coasts of Babeldaob, Peleliu, and Ngemelis. Information presented is based on one-time surveys, past nesting activity, and resource interviews, and includes descriptions of beach suitability to nesting, identification of historic and current sea turtle nesting beaches, and an assessment of beach importance and documented levels of human-related disturbance. One (1) nest is reported. This assessment concludes that beaches located in areas other than the Rock Islands and extreme northern and southern areas of the Palauan archipelago are likely to have little current nesting activity. This work initiated the cataloging of beach names and locations for turtle and natural resource managers.

Guilbeaux, M.D. *Summary Report of Sea Turtle Nesting Beach Suitability Survey September-October 1992. Palau REA. Submitted as part of Maragos, J. E. 1994. Marine and Coastal Areas Survey of the Main Palau Islands: Part 2 Rapid Ecological Assessment Synthesis Report. Prepared for the Palau Bureau of Natural Resources and Development by The Nature Conservancy, Maragos, J. E. ed.*

This work reports on a survey of sea turtle nesting areas in Kayangel and Angaur; a description of beach suitability for nesting; identification of historic and current sea turtle nesting beaches; an investigation of beach importance; and documented levels of human-related disturbance. The information is based on one-time surveys that describe beach characteristics, past nesting activity, and resource interviews. Maps are also included.

Guilbeaux, M.D., S. Davis and T. Tonne. 1994. *Results of Hawksbill Sea Turtle Monitoring in the Palau Rock Islands: 1994 Mid-Year Nesting Season. Report of the Division of Marine Resources, Bureau of Natural Resources and Development. Republic of Palau.*

This work summarizes the second phase of nighttime nesting beach monitoring initially conducted in 1992. Surveys were conducted in two island groups (Ngerukewid and Kmekumer) from February 1 to March 24, 1994. It reports nineteen (19) nests found during fifty (50) survey days on eleven (11) beaches. Information together with that of Atkinson and

Guilbeaux (1992) contributed to the estimation of Rock Island hawksbill nesting females provided in USFWS 1998a.

Birkeland, C. et al. In-prep. *State of Helen Reef 2000: Natural Resource Survey and Baseline of Helen Reef, Hatohobei State, 2000. Prepared for the Hatohobei State Government and the Community Conservation Network.*

This work summarizes marine resource surveys and sea turtle monitoring efforts conducted at Helen Reef during the April and August, 2000. The findings from observations on Helen Island indicate moderate nesting; although nesting turtles and eggs remain vulnerable to poaching. The report also includes observations of free-swimming turtles during reef monitoring activities.

3. ASSESSMENTS, STATUS REPORTS, RECOVERY AND MANAGEMENT PLANS, AND RECOMMENDATIONS

Published assessments, status reports, and recommendations for Palau sea turtles are provided below in chronological order from 1977.

Pritchard, P.C.H. 1977. *Marine Turtles of Micronesia. Chelonia Press. San Francisco.*

This report describes turtle species, abundance, and distribution within Palau, as well as brief information on customary use and practices.

Pritchard, P.C.H. 1982. *Marine Turtles of Micronesia in Biology and Conservation of Sea Turtles. Proceedings of the World Conference on Sea Turtle Conservation. Washington, D.C. Karen A. Bjorndal, ed.*

Reprinted version of Pritchard, 1977.

Johannes R.E. 1986. *A Review of Information on the Subsistence Use of Green and Hawksbill Sea Turtles on Islands Under United States Jurisdiction in the Western Pacific Ocean. National Marine Fisheries, Service Southwest Region. Administrative Report SWR-86-2; 41 pp.*

This review provides a report of the subsistence use of turtles in Micronesia and other U.S. flagged islands in the Western Pacific. It also contains information on traditional knowledge and practices in Palau, including sea turtle behavior and hunting techniques; it indicates various changes from and influences of traditional practices; mentions the perception of population decline among many older fishermen over the past ten to twenty (10–20) years; describes the use of turtle, as well as increasing pressure on turtle populations; and it discusses reliance on turtle and pending conservation needs.

Johannes R.E. 1991. *Some Suggested Management Initiatives in Palau's Nearshore Fisheries, and the Relevance of Traditional Management*. CSIRO Division of Fisheries, Hobart Australia.

This work addresses issues facing Palau's nearshore areas and species, and it includes a summary of interviews with fishermen and fisheries personnel¹², new suggested laws, enforcement recommendations, description of traditional authority, National and State government authority and regulations, and discussion and conclusions on improving the enforcement of conservation laws.

Maragos, James E. 1991. *Assessment and Recommendations for the Conservation of Hawksbill Turtles in the Rock Islands of Palau. Draft Report*. May 1991. Prepared for the Republic of Palau, Bureau of Resources and Development by The Nature Conservancy, Pacific Region, Honolulu.

This draft report and management plan provides recommendations and summary information on hawksbill sea turtles nesting in the Rock Islands, the MMDC "headstart" hatchery program, and management strategies. It also focuses on enhancing enforcement, education and interpretation, monitoring, and research, together with a list of Rock Island nesting beaches ranked by perceived importance; a map is included.

Maragos, James E. 1992. *Draft Sea Turtle Recovery Plan for the Republic of Palau*. Draft report prepared for the Republic of Palau, Bureau of Resources and Development by The Nature Conservancy, Pacific Region, Honolulu. November 1992; 39 pp.

This draft recovery plan updates Maragos' hawksbill management plan (1991), and recommends that all marine turtle species and nesting and foraging areas in the Republic¹³ be covered by protective management measures. Included are 1) threats, 2) summaries of Rock Island hawksbill nesting from 1982 to July 1992, 3) lists and ranks of importance of potential and known nesting beaches throughout the Republic, 4) a list of tag recaptures and locations from "headstarted" hawksbill turtles¹⁴, 5) 1991 aerial survey results, 6) research and conservation needs, 7) recommendations on enforcement, 8) public education, and 9) maps.

Iosefa Maiava and the Bureau of Natural Resources and Development. 1994a. *Republic of Palau National Management Strategy*. SPREP Publication. 108p.

This report contains a national strategy for the sustainable management of natural resources dealing with site specific management plans, enhancing enforcement, and special management concerns. One sentence in the document relates to turtles: "Concern also exists over perceived declines in adult green and hawksbill turtles although actual populations and causes of these declines remain undocumented."

Iosefa Maiava and the Bureau of Natural Resources and Development. 1994b. *State of the Environment. Republic of Palau*. SPREP Publication. 108p.

Contains same sea turtle recommendations as Maiava (1994a) above.

Donnelly, Marydelle. 1994. *Sea Turtle Mariculture: A Review of Relevant Information for Conservation and Commerce*. Center for Marine Conservation; 113p.

This review assesses and makes recommendations for the mariculture of sea turtles and the practice of "headstarting" for conservation purposes. Included is a case study of the Palau MMDC hawksbill headstarting experience and reasons for termination, as well as recommended precautions when using headstarting as a conservation intervention.

Guilbeaux, M. D. 1995. *Background to Sea Turtle*

Conservation Issues in Palau. Georgia Sea Turtle Cooperative. Prepared for the Division of Marine Resources and the Palau Conservation Society. Unpublished. 2p.

This reference (locally published) contains educational information on sea turtle biology and conservation issues relative to the Republic of Palau.

Guilbeaux, M.D. 1995. *Maintaining the Sea Turtle Resources of Palau: Recent Findings from Sea Turtle Biology can Help Prevent the Loss of Sea Turtle Populations from Palau.* Georgia Sea Turtle Cooperative. Prepared for the Division of Marine Resources and the Palau Conservation Society. Unpublished. 2p.

This brief policy analysis and review (locally published) contains suggestions and recommendations on how to adjust the harvest of sea turtles to more sustainable levels. It also contains suggestions for sharing information on sea turtle conservation issues in the Republic of Palau.

Gordon, Maura. n.d. *Conservation Practices and Ethics of Palau.* Palau Resources Institute with the South Pacific Regional Environment Program.

Description of traditional conservation practices and ethics in Palau. Describes the importance of customary marine tenure. Identifies the harvest of certain vulnerable species, including turtle, as severely restricted in traditional times. Harvests would occur only with chiefly permission and the catch would be offered first to the chief, who would then return a portion for the harvester's personal use. Includes the popular legend of the sea turtle of Ngemelis as a demonstration of traditional knowledge of sea turtle behavior.

The Nature Conservancy et al. n.d. *Rock Islands Conservation/Management Plan. Recommendations to Koror State Regarding Planning and Protection for Coastal Resources.* The Nature Conservancy – Micronesia Field Office.

This early planning document (circa 1994) provides recommendations to Koror State regarding planning and protection of its coastal resources found

within the Rock Islands, and includes a section on Rock Island beach protection and planning specific to hawksbill sea turtles. More recent documents produced as part of a comprehensive planning process are available from The Nature Conservancy and the Palau Conservation Society.

Otto, J. 1997. *Sustainable Human Development in Palau: Progressing with the Past.* Palau National Committee on Population and the United Nations.

Broad review of sustainability issues facing contemporary Palau are included, as well as an assessment of human well-being and environmental conditions in Palau. Regarding environmental sustainability issues, this report identifies several key issues and recommends strategies to address these problems, such as: 1) consensus building, 2) education and awareness, 3) enhancement of legislation and regulation, 4) land-use management, 5) improving enforcement, and 6) the development of protected areas. Also mentioned is the critical need for improving enforcement at all levels of society, and the fact that hawksbill turtles have been identified as sensitive species that warrant further protection.

NMFS & USFWS 1998a. *Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle (*Eretmochelys imbricata*).* National Marine Fisheries Service, Silver Spring, MD. 82 pp.

This comprehensive review and summary presents a recovery strategy for the management of hawksbill turtle populations found within or shared by areas under U.S. jurisdiction. The document outlines recovery goals, status information, site-specific information, review of specific threats, and a list of priority recovery actions and goals. Summarized for Palau are status estimates and specific threats for Palau hawksbill turtle populations. Important references included in this review are the apparent decline of recent nestings of hawksbill turtles in the Rock Islands, the pervasiveness of commercial tortoise shell products, and the importance of the cultural use of *toluk* in Palauan society.

A few of the specific recommendations in the Plan include: 1) stop direct harvest of hawksbill turtle and eggs through education and law enforcement actions, 2) reduce incidental mortalities of hawksbills by commercial and artisanal fisheries, 3) determine popula-

tion size, survivorship, and genetics, and 4) protect nesting and foraging habitats.

NMFS & USFWS 1998b. *Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*)*. National Marine Fisheries Service, Silver Spring, MD. 84 pp.

This comprehensive review and summary presents a recovery strategy of green turtle populations found within or shared by area under U.S. jurisdiction. The document outlines recovery goals, status information, site-specific information, review of specific threats, and a list of priority recovery actions and goals. Summarized for Palau are status estimates and specific threats for Palau green turtle populations. Important references included in this review are the reduction of nesting, the pervasiveness of supply vessels transporting turtles more regularly and in greater volumes from the Southern Islands, and the importance of customary use and harvesting.

A few of the specific recommendations in this plan include: 1) stop direct harvest of green turtle and eggs through education and law enforcement actions, 2) reduce incidental mortalities of hawksbills by commercial and artisanal fisheries, 3) determine population size, survivorship, and genetics, and 4) protect nesting and foraging habitats.

Guilbeaux, M.D. 1998. *1998 Annual Ngeruangel Conservation Area Monitoring Survey of Ngeruangel Island*. Prepared for the Palau Conservation Society and The Nature Conservancy by the Community Conservation Network. 8pp.

This report, the result of an overnight monitoring event on Ngeruangel Island in July 1998, contains a description of beach characteristics, suitability to nesting, and recent sea turtle nesting activity. Included are accounts of recent nesting attempts and forty six (46) older nesting pits, together with observations of predation on hatchlings by hermit crabs, management recommendations, and a map.

Cassell, J., D. Otobed, and H. Adelbai. 1992. *Comprehensive Conservation Strategy for the Republic of Palau. A Review of the Palau Conservation Program and Recommendations for Additional Program Policies*. Report Prepared

for the Division of Conservation and Entomology of the Bureau of Resources and Development, Republic of Palau. 8 June 1992.

This report presents a wide range of conservation topics and potential management strategies for Palau. Cassell identifies a series of key issues concerning sea turtle management and highlights as potentially problematic the current legal framework for sea turtle management, especially as it relates to the enforcement of hawksbill turtle regulations within the Republic.

World Bank. 1999. *Voices from the Village: A Comparative Study of Coastal Resource Management in the Pacific Islands. Summary Report*. Washington, D.C.

This study of community perceptions—of coastal resource management in five Pacific Island countries, including sites in Palau—contains interviews and questionnaires used to uncover local perceptions regarding resource trends and other relevant potential aspects of resource management. One relevant finding of this study is the conclusion that perceived compliance with turtle regulations through related sites was very low. Communities often felt that such rules conflicted with cultural obligations, such as giving turtles to the chiefs, and that “turtle meat was just too tempting to resist.” Recommendations include that a detailed review of successes and failures in turtle management, from both a historic and regional perspective, be conducted.

Daleiden, C. 1999. *Legal Issues Associated With the Establishment, Management and Enforcement of Marine Conservation Areas Located in Kayangel*. Prepared for The Nature Conservancy Palau Field Office

This is a study of legal issues surrounding the establishment and implementation of a marine protected area within the jurisdiction of a local state government. The review contains references to identified legal concerns related to the further restriction of sea turtle harvesting and identifies potential conflicts between planned management and current national legislation.

The Nature Conservancy. 2000. *Ngeruangel Reserve*

Management Plan: Parts I and II. Prepared for Kayangel State Government Republic of Palau by The Nature Conservancy Palau Field Office.

This Management Plan drafted for the Ngeruangel Atoll Reserve includes specific references, rules, and regulations specific to the harvesting of sea turtles. It completely restricts the harvest of hawksbill turtle from within the reserve, and it limits the take of green turtles to four (4) turtles of legal size for specific locally sanctioned purposes during the open turtle season.

Graham T. 2000a. *Draft Investigation Plan for the Rock Islands.* The Nature Conservancy, Asia Pacific Region, Coastal Marine Program.

Graham T. 2000b. *Draft Long-Term Monitoring Program for the Natural Resources of the Rock Islands.* The Nature Conservancy, Asia Pacific Region, Coastal Marine Program.

Graham T. 2000c. *Draft Long-Term Monitoring Program for the Natural Resources of Ngeruangel.* The Nature Conservancy, Asia Pacific Region, Coastal Marine Program.

Graham's three documents (above) outline, in draft, potential long-term strategies for the monitoring of natural resources in two key sea turtle nesting and foraging areas: Ngeruangel Atoll, and the Rock Islands. These two draft management plans, and one investigative plan, provide suggested approaches for

long-term monitoring of sea turtle populations and other investigations that may be helpful for improving management. Strategies designed specifically for each site offer techniques for obtaining information on nesting crawls and sea turtle population genetics. Also, Graham's outline provides estimates on associated costs and priorities for monitoring.

Palau Conservation Society. 2000. *Palau's Locally Based Foreign Tuna Fishery: Benefits and Costs to Palau.* 73pp.

This study of Palau's foreign tuna fishery includes by-catch reports, statistics on marine turtle by-catch, and by-catch of other species of (p.30). It notes that the take of turtle species in off-shore waters occurs in small numbers.

Fry K., S. Siwatibau, S. Why, and J. Whyte, 2000. *Appendices: Building Capacity for Marine Conservation in the Western Pacific: A Framework for Collaboration.* FSPI Island Consulting, Port Vila, Vanuatu.

This document provides a review of capacity issues relating to organizations involved with marine conservation and coastal natural resource management in the Pacific. Consultations in Palau identified declining sea turtle populations and failures of current management regimes as a major area of concern among conservation practitioners and managers.

¹ See specific reports and documents for comprehensive information.

² Anecdotal information is defined here as information that is collected or available in a manner not derived from systematic, quantitative, repeatable, or comparable recording of sea turtle observations.

³ The benefits of a body of anecdotal information/local knowledge to resource management efforts are that its scope is potentially extensive and can span over many years; however, its reliability is generally hindered by difficulties in memory retention, completeness of scope of records, and accuracy.

⁴ This and other recorded information concerning

perceptions and observations of relative abundances or status of turtles (or any other resource) may very well be affected by "shifting baseline syndrome" (Pauly 1995; Sheppard 1995), which relates to the age and relative experience of the informant. This syndrome refers to a phenomenon where different generations may perceive and report absolute abundances of resources differently. It is a general tendency for humans to measure change against what they consider to be a starting or baseline condition, usually that point during their lifetimes at which they themselves first viewed the phenomenon in question. Baselines are thus constantly (and unconsciously) reset, leading

to the distortion of historical perspective (Maylan, 2001). For example, a young fisherman may consider what he observes today based on personal experience as a high level of turtles; however, his grandfather may consider the same level as relatively few compared to what he observed as a younger man. Additional complications include the fact that sea turtle populations are subject to overlapping seasonal migrations, which may cause resident numbers to fluctuate widely, making accurate estimations of total populations difficult.

⁵ See Semper 1873; Kubary 1885; Kramer 1967; Tobin et al. 1957; McCoy 1974; Owen 1978; and Johannes 1986.

⁶ Pre-WWII Palau turtle exports accounted for in South Sea Bureau (1937), South Sea Fisheries (1940) translated by Masanami Izumi, South Pacific Commission (in Palau Division of Marine Resources 1992 Annual Report).

⁷ Earlier attempts at raising hawksbill have occurred in Palau, as noted in Tobin *et al.* (1957), Helfman (1968) and other sources.

⁸ Consideration of benefits and costs is especially relevant where long-term information is desired or needed, due to the fact that in Palau and other developing countries the longevity and sustainability of efforts always appears to be at risk due to funding constraints in the sector of resource management and conservation, deficiencies in capacity, or other factors.

⁹ Observations of sea turtles were not included in follow-up dugong aerial survey of 1999 (Andrew Smith, personal communication, 2000).

¹⁰ Turtles previously tagged using SPREP tags provided during an SPC regional tuna tagging expedition (personal correspondence by D. Itano to A. Newman,

1991). Itano's correspondence (1991) also provides anecdotal information on previous green turtle nesting levels.

¹¹ Later information revealed isolated, nesting of hawksbills on Tobi (Mike Matthews, pers. com., 1995).

¹² Interestingly, Johannes explicitly states that turtle species are not mentioned by fishermen as a species of concern (p10), a problematic conclusion due to the special importance given to turtles in Palauan (non-commercial) fisheries, the history of acknowledgement and concern of sea turtle problems in the Republic, and attempted conservation measures (*e.g.*, egg "headstarting" hatchery, enforcement, etc). There is, for example, Johannes' 1986 mention that "older fishermen seemed unanimous in their opinion that turtles were far less abundant than they had been ten to twenty (10–20) years before, with a decrease in the numbers of large green turtles being especially noticeable" (1986, p. 9). Additionally, he cites Pritchard (1982) in estimating that roughly 80% of the eggs laid in Palau are harvested.

¹³ This report contains revised information on Palauan hawksbill turtles. Included are summaries of headstarting and nesting data from November 1987 to September 1990, as was compiled by George Balazs, NMFS, Honolulu; "headstarting" operations data from 1982–1990 are summarized by Maragos in *Assessment and Recommendations for the Conservation of Hawksbill Turtles in the Rock Islands of Palau. Draft Report*. May, 1991; and nesting activity from January to July 1992 is summarized from Atkinson and Guilbeaux, 1992.

¹⁴ Data obtained from Sato, 1991.

APPENDIX 2

ANNOTATED LIST OF RECOMMENDED OR ACTUALIZED MANAGEMENT MEASURES FOR ENHANCING RECOVERY, CONSERVATION, AND MANAGEMENT OF SEA TURTLES IN THE REPUBLIC OF PALAU

The following is a chronologically-ordered document list of recommended management measures for the enhancement of recovery, conservation, and management of sea turtle populations in the Republic of Palau since 1991.

1. RECOMMENDATIONS FROM PALAU-U.S. WORKSHOP ON ENDANGERED SPECIES, LAW ENFORCEMENT, AND U.S. FEDERAL AID – 1991

Palau and U.S. officials held a workshop (Anonymous 1991), to discuss endangered species conservation measures. According to mutual consensus between Palau and U.S. officials, it was concluded that the U.S. ESA applies to Palau while still a Trust Territory and that it is the responsibility of the USFWS to enforce ESA regulations. Also it was agreed by both Palau and U.S. teams that there are difficulties enforcing endangered species protective laws in Palau, especially in the case of endangered sea turtles.

Agreed Upon Suggestions:

1. Outreach and public education are crucial to any conservation and law enforcement program.
 - a. In order for outreach and public education to be effective, all levels of society in Palau must be included—from government dignitaries and officials, to all members of Palau’s common population living in cities or the most remote of Palau’s villages.
 - b. Collaboration should be had with the existing South Pacific Regional Environment Programme’s (SPREP) Regional Sea Turtle Conservation and Research Programme.
 - c. Partnerships should be developed between agencies to create a team of specialists responsible for the creation and distribution of educational materials according to USFWS guidelines.

2. Create funding proposals that can make possible the hiring of more enforcement officers, who through their increased presence, can increase the chances that conservation efforts will succeed.
3. Develop a fully operational system that monitors and appropriately regulates the import and export of wildlife products.
4. Reconcile all of Palau’s National Code conflicts that impede management, conservation, and all related protective efforts of species currently on “endangered” or “threatened” lists.
 - a. Suggest a new set of law and/or guidelines to make marine resource management and enforcement more effective.
 - b. Develop a well-monitored system for the issuing research permits.
5. Ensure all privately or federally funded endangered-species projects/programs (*e.g.*, turtle mariculture or “headstarting”) comply with all U.S. ESA regulations.
6. Using the Alaska’s Bowhead Whale Exemption as an example, model cultural- and subsistence-based exemptions on the taking of hawksbill and green sea turtles in Palau.
 - a. Determine currently practiced traditional and cultural uses of wildlife in Palau.

2. SOME SUGGESTED MANAGEMENT INITIATIVES IN PALAU’S NEARSHORE FISHERIES, AND THE RELEVANCE OF TRADITIONAL MANAGEMENT. JOHANNES, R. E. – 1991

In 1991, Robert Johannes produced a review of problem fisheries issues facing Palau’s near-shore areas and species (Johannes 1991). This document includes summary of interviews with fishermen and fisheries personnel, new suggested laws, enforcement suggestions, description of traditional authority, national and state government authority and regula-

tions. This review provides a thorough discussion and conclusions on improving the enforcement of conservation laws, including new arrangements in management regimes and structure. Additionally, this review suggests addressing the current problems by sharing of responsibility of marine resource management among national and state governments, traditional authority, and fishermen.

3. PALAU MARINE RESOURCE DIVISION (PMRD) TERMINATES HAWKSBILL MARICULTURE (HEADSTARTING) ACTIVITIES IN KOROR – 1991

Based on recommendations from the DMR 1991 workshop titled *Endangered Species, Law Enforcement and U.S. Federal Aid* (see Anonymous 1991), the Palau Division of Marine Resources announced it will be terminating its current Hawksbill Mariculture Program conducted at the Micronesian Mariculture Demonstration Center (PMRD 1991). This decision was made in part due to scientists' opinions on the potential of significant negative biological impacts that this experimental conservation approach may have on nesting sea turtle populations with regards to collection of eggs, mortality in captivity, and disruption of natural behavior (*e.g.*, migration). New activities for sea turtle recovery will be proposed by The Nature Conservancy's Chief Scientist.

4. DRAFT RECOVERY SEA TURTLE MANAGEMENT PLANS PREPARED FOR PALAU – 1991 & 1992

Author Maragos drafted two plans for sea turtle recovery and conservation: 1) A plan specifically designed hawksbill turtle conservation (Maragos 1991), and 2) a national plan regarding both hawksbill and green sea turtles (Maragos 1992), which remains a comprehensive source of quantitative information on the condition of Palau's sea turtle populations.

Recommendations in the 1992 draft plan:

1. Research and Monitoring:
 - Initiate regular data collection at key nesting beaches, such those in the Rock Islands, Merir, Tobi, Helen, Ngarekeklaui, and Kayangel (*e.g.*, Ngeruangel).
 - Determine, monitor, and estimate as needed and appropriate: the number of

beach crawls; proportion of crawls resulting in successful nests; remigration intervals; recruitment and mortality; nesting beach fidelity; nest success and hatchling production; evidence of egg poaching; seasonal population fluctuation; populations fluctuations within a specific season; and genetic relationships between populations.

2. Conservation Activities:
 - Nuisance predator control; relocation of picnic areas; prohibition of overnight camping and campfires.
3. Enhanced Enforcement of Regulations:
 - Additional National Conservation officers.
 - Support to National Conservation officers by state personnel and tour operators.
4. Public Education and Awareness:
 - Increased turtle biology awareness campaigns designed to educate fishermen and other related groups.

Note: These plans claim sale of hawksbill turtle shell jewelry has been controlled and is no longer a threat.

5. PROPOSED FORM FOR REGISTERING TOLUK (WOMEN'S TURTLE SHELL MONEY) IS DESIGNED FOR USE IN PALAU – 1992

Should U.S. ESA have become fully implemented and enforced in Palau, an identification system would have been needed for legally exempted wildlife products, such as those with a culturally defined use. In the case of women's turtle shell money, an identification and registration model was offered for the handling of individual *toluk* pieces (USFWS 1992).

6. PALAU COMMUNITY ACTION AGENCY IS ADVISED REGARDING THE TRANSPORT OF ENDANGERED SPECIES AND EGGS ABOARD PALAU SOUTHWEST ISLAND FIELD TRIP VESSELS – 1992

An official letter from the U.S. Department of Health and Human Services (1992) identifies apparent violations of compliance with the Palau National Code and U.S. Endangered Species Act according to observations made during Field Trip operations to the

Palau Southwest Islands. In this letter, recommendations were made that stricter compliance with environmental standards be followed, in order to not jeopardize current and future government funding. Included was also a mandate for the identification of all ships officers aboard all U.S. federally and nationally funded field trips responsible for ensuring compliance with established U.S. and TT sea turtle regulations.

7. RECOMMENDATIONS FROM A PALAU DIVISION OF MARINE RESOURCES EDUCATIONAL PAMPHLET, SEA TURTLES OF PALAU – 1993

The *Sea Turtle Education and Awareness* pamphlet, produced by the Division of Marine Resources (1993), provides recommendations to would-be harvesters suggesting that during the open season, only adult male turtles are harvested.

8. RECOMMENDATIONS FROM THE SOUTH PACIFIC REGIONAL ENVIRONMENT PROGRAMME (SPREP) REGIONAL MARINE TURTLE CONSERVATION PROGRAMME STRATEGIC PLAN – 1993

SPREP (advised by Colin Limpus) produced a Strategic Plan for the conservation of sea turtle resources of member countries for the years 1994–1996 (Limpus 1993). This plan offers a prioritization of objectives related to the management of marine turtles according to their cultural, economic, and nutritional significance to the coastal peoples of the countries served by SPREP.

Suggested principles to be applied in achieving the plan's goal include:

- Ecologically sustainable utilization.
- Maintenance of biodiversity.
- When there is a conflict of interests, cultural utilization takes precedence over commercial utilization, and conservation of species takes precedence over cultural utilization.

The following tasks were recommended to member countries as means to achieve the goals set by the program:

1. Reduce negative impact from human activities on foraging areas and nesting habitat.
2. Reduce regional level of harvest.

- a. Reduce the harvest of adult and near-adult turtles.
 - i. Protect green turtles with carapace length greater than eighty (80) cm.
 - ii. Protect hawksbill turtles with a carapace length greater than sixty (60) cm.
 - b. Harvest male instead of female turtles.
 - c. Where harvest of nesting turtles is practiced, limit harvesting to one percent (1%) of the total nesting population; and, when possible, take late in the nesting season so as to permit the near completion of sea turtles' egg-laying cycle.
 - d. Reduce egg harvest.
 - i. Ensure that a minimum of seventy percent (70%) of egg clutches successfully produce hatchlings to the sea.
 - ii. Initiate beach management programs that address the needs of nesting beaches with reduced successful rates due to excessive harvest and/or unusually high natural mortality. Egg hatchery programs may be useful in these areas.
3. Investigate possible tourist-industry collaboration to ensure tourist activity that is non-disruptive to sea turtles.
 4. Develop mechanisms for maintaining essential elements of turtle related cultural activities while at the same time reducing the number needed that need to be harvested.

9. A REVIEW OF RELEVANT INFORMATION ON SEA TURTLE MARICULTURE IS PUBLISHED BY THE CENTER FOR MARINE CONSERVATION – 1994

A review of *Relevant Information on Sea Turtle Mariculture* (Donnelly 1994) makes several recommendations on the mariculture of sea turtles, including the practice of "headstarting" for conservation purposes. The study also includes a case study of the Palau MMDC hawksbill headstarting experience, and examines reasons for its termination. Lastly, this review recommends precaution when using headstarting as a conservation intervention, especially with limited resources.

10. RECOMMENDATIONS REGARDING THE PLANNED HARVESTING OF SEA TURTLES FROM THE SOUTHWEST ISLANDS FOR PRESIDENTIAL INAUGURATION – 1994

Former Chief of Marine Resources Noah Idechong's (1994) memorandum to Director of the Palau Bureau of Natural Resources and Development highlights two important limitations in Palau's existing sea turtle management regimes: 1) the desire for having turtle served at important events that aren't necessarily traditional in the strict sense of the word, and 2) the fact that during open season unsustainable numbers of sea turtles can be caught—a practice, however, that is, under current regulations, well within Palau's sea turtle management policy.

The memorandum also suggests that those planning the event exercise restraint and make responsible decisions in light of regionally declining sea turtle populations. Lastly, it recommends: 1) that the number of turtles harvested be reduced from 30 to 5, and 2) harvests be restricted to male turtles only.

11. A SERIES OF AMENDMENTS TO REVISE PALAU'S ENDANGERED SPECIES ACT (ESA) PROPOSED BY MANAGERS AND CONSERVATIONISTS – 1994

Managers wishing to improve species recovery and compliance of natural resource laws, offered their recommendations regarding Palau ESA's currently used framework for implementation and enforcement of wildlife conservation measures. The conservation of sea turtles occupied a central place in this and in other discussions and debates on the current condition of the Palau ESA. C. Cook, N. Idechong, T. Graham, M. Guilbeaux (TNC 1994; PMRD 1994) and others, worked together to revise and recommend that amendments be made in order to improve effectiveness.

Some specific recommendations:

1. List as “endangered” and “threatened” all species of sea turtle in Palauan waters due to continuing depletion of local populations and the continued existence of serious threats.
2. Establish a complete moratorium on the harvest of all hawksbills.
3. Revise size class regulation and change to a maximum size to protect breeding adults.
4. Limit transportation of turtles outside of

the areas where they were legally harvested.

Some recommendations from the OEK during this time suggested that year-round, unlimited subsistence take of turtle be permitted.

12. SUGGESTIONS FOR REVISING PALAU'S CURRENT SEA TURTLE MANAGEMENT AND HARVEST POLICY – 1994

Recommendations regarding revisions to existing Palau sea turtle management and harvest policies presented by hawksbill turtle specialist James Richardson (1994):

- Because so few of them remain, protect nesting females at all cost.
- In order that pressure may be reduced on locally nesting populations, no turtles should be taken except from foraging stocks.
- That nesting females be protected for decades in order that they may be able to replace the declines sustained by current sea turtle populations.
- That since hawksbills are so close to extinction in Micronesia, none should be taken.
- That if green turtles are allowed to be harvested, only males should be taken.

13. IN-COUNTRY SEA TURTLE MANAGEMENT MEASURES DEVELOPED PRESENTED TO SPREP REGIONAL MARINE TURTLE CONSERVATION PROGRAMME MEMBER COUNTRIES – 1994

In preparation for an SPREP RMTCP meeting to discuss conservation strategies and a “year of the sea turtle” educational campaign, Andrew Smith (1994) provided examples of sixty four (64) different in-country sea turtle management measures in seven (7) different categories.

These seven (7) categories include management restrictions and comments on:

- Harvest Limitations
- Use Limitations
- Location Controls
- Turtle Products
- Species
- Lifecycle
- Indirect Measures

14. COMMENTS AND RECOMMENDATIONS ON PROPOSED REVISIONS TO PALAU'S EXISTING SEA TURTLE MANAGEMENT REGIME IS PROVIDED BY SPREP ADVISOR – 1995

Comments by Colin Limpus (1995) on drafts of documents proposing modification to Palau's existing sea turtle management framework include the following advice and recommendations:

1. Encourage villagers' efforts and understanding with respect to the implementation of turtle monitoring by means of promoting the use of calendars to track turtle usage and tagging in order to make record keeping easier.
2. Comments on Draft Recommendations in preparation by Guilbeaux.
 - a. Supports revising turtle regulations to implement a maximum size to protect larger turtles.
 - b. Cautions should be exercise with respect to the harvest of "foreign" turtles since Palau needs to demonstrate a willingness to cooperate with foreign countries in support of international conservation efforts of shared resources.
 - c. Suggests developing a system to monitor harvest according to species, size, and number.
 - d. Recommends collecting tissue samples for genetic analysis.
3. Limpus comments that he would professionally support the concept of providing small quantities of confiscated hawksbill shell to be used as substitute to wild-caught shell for traditional purposes (*toluk*), if 1) this was seen as a rational and accepted approach to minimizing the disruption of the traditional *toluk* economy in Palauan society due to an effective moratorium on wild-caught hawksbills, and 2) a formal recommendation/request came from the Palau government.

15. PRIMER TO SEA TURTLE BIOLOGY AND CONSERVATION ISSUES IN PROVIDES GENERAL RECOMMENDATIONS FOR NEW POLICY IN PALAU – 1995

Written for managers and decision makers, *Background to Sea Turtle Conservation Issues in Palau* (Guilbeaux 1995a) provides information on sea turtle biology and status, relative to their conservation and recovery in Palau. In addition to biological information, the document suggests general recommendations and alterations to suit Palau's regulatory framework:

- Reduce numbers of turtles killed.
- Following SPREP's RMTRC Programme's Strategic Plan (1994–1996) recommendations, in cases in which commercial subsistence and traditional use conflict, subsistence or traditional use should take precedence over commercial use, and species survival should take precedence over subsistence or traditional use.
- If protection is to be provided for a particular size (age) of turtles, it is biologically sounder to afford protection to the populations' large, reproductively mature adults, especially adult females.
- Develop alternatives to turtle shell (tortoise-shell) products.
- Regulations should reflect scientific recommendations for harvest and wise management.

16. MAINTAINING THE SEA TURTLE RESOURCES OF PALAU PROVIDES SPECIFIC POLICY RECOMMENDATIONS – 1995

An accompanying document to *Background to Sea Turtle Conservation Issues in Palau* (Guilbeaux 1995a), *Maintaining the Sea Turtle Resources of Palau* (Guilbeaux 1995b) offers more specific policy recommendations to improve the management and recovery of populations. This document focuses on strategies to improve compliance and enforceability of Palau's current sea turtle regulation and protection efforts, while emphasizing population sustainability and biological principles.

1. Reserve turtle take for Palauans only.
2. Reserve turtle take strictly for subsistence or traditional use only.
3. Prohibit commercial sale and export of all turtle products.
4. Prohibit the taking of adult females and their eggs.

5. Specific for *Ngasech*:
 - a. Place a complete moratorium until local populations recover to harvestable levels
6. Specific for *Melob*:
 - a. To ensure that harvested turtles are from foraging stock and are young turtles (that are more likely to be replaced within the population), it is recommended that only green turtles with carapaces (straight measure) no longer than 28" (71cm) be taken.
7. Brought to shore alive and unharmed so that turtles that do not meet set requirements can be released unharmed.
8. Subsistence use managed by a yearly quota.

17. PRESIDENT ENDORSES SEA TURTLE MARICULTURE MEASURES IN SONSOROL STATE – 1997

In an official letter to the Governor of Sonsorol (Nakamura 1997), President Nakamura authorized an exemption to the Sonsorol State for the purpose of raising and releasing captive turtles taken from the wild (at Merir Island). The President applied a justification of scientific purpose.

18. RECOVERY PLANS FOR U.S. PACIFIC POPULATIONS OF SEA TURTLES PUBLISHED BY THE U.S. FISH AND WILDLIFE SERVICE – 1998

U.S. Pacific Sea Turtle Recovery Plans (NMFS and USFWS 1998a, 1998b) provide a comprehensive review and summary of information of Palau's hawksbill and green turtle populations. Also presented is a broad recovery strategy of hawksbill and green turtle populations found within (or shared by in) areas under U.S. jurisdiction. Information on Palau remained included in the plan, although by the time of publication it was non-binding for Palau, because since 1994 Palau had become "freely-associated" and was no longer under the U.S. Government jurisdiction through the former Trust Territory Administration. This document presents recovery goals based on biological criteria, status information, site-specific information, review of specific threats, and a list of priority recovery actions and goals for Pacific sea turtle populations.

A summary of general action categories include the following:

1. Protect and manage turtles on nesting beaches.
 - 1.1 – Eliminate direct take of nesting turtles and their eggs through education and increased enforcement.
 - 1.2 – Collect biological information on nesting populations.
 - 1.3 – Protect and manage nesting habitat.
2. Protect and manage turtles in the marine environment.
 - 2.1 – Eliminate directed take of turtles in marine environment through education. and increased enforcement.
 - 2.2 – Determine distribution, abundance (density), and status in marine environment.
 - 2.3 – Protect and manage marine habitat, including foraging habitat.
3. Ensure proper care in captivity.
4. International cooperation through international agreements and conventions.

19. WORLD BANK STUDY "VOICES FROM THE VILLAGE" RECOMMENDS A REVIEW OF TURTLE MANAGEMENT IN THE PACIFIC – 1999

This Pacific-wide study (World Bank 1999), in which coastal communities in Palau participated, found that the perceived compliance with turtle regulations across the region was very low. The summary report recommends a detailed review of successes and failures in turtle management, from historical and regional perspectives.

While other recommendations presented were intended to cover general coastal resource issues, many were particularly relevant to sea turtle conservation and management.

Some of the most relevant of these recommendations are the following:

1. Restrict harvest effort.
 - Raise traditional leaders' awareness of the benefits of regulatory measures.
 - Establish national legislation that allows stricter control over commercial harvest efforts.
 - Impose point-of-export or point-of-collection restrictions on trade.
2. Integrate/coordinate coastal resource management with land-based management activities.

3. Target national legislation more closely to local needs.
 - Begin campaigns to disseminate national rules in a broader fashion that is able to reach all traditional decision makers.
 - Develop a legal framework that encourages community leaders to adopt relevant national legislation as part of village or local rules.
 - Simplify rules at local level in order to make them easy to understand. Consultations with community leaders and resource users can help tailor rules more closely to the needs of each respective community.
 - The experience of previous legislative reviews should be recorded and presented as lessons to be shared with all parties involved, including the general public.
4. Support collaborative and stronger enforcement.
 - National governments support collaborative enforcement with all other levels of government and community leaders.
 - Coastal managers become involved in publicizing successful prosecutions and associated penalties or all sea turtle violations.
5. Increase government assistance to coastal communities.
 - Establish programs that give coastal communities periodic management-oriented visits and/or advice.
 - Active collaboration between agencies and organizations.
 - Develop stronger incentives for government provision of management assistance. The work of coastal extension workers should be recognized and rewarded sufficiently.
 - The role of regional organizations should not be overlooked.
6. Promote sound external partnerships for coastal resource management using the following guidelines:
 - External partners' long-term commitment to work with the communities.
 - The provision of information to the community in different forms as a central feature of partnership.
 - Efficient administrative support.
 - Reliance of external partner(s) on indigenous institutions and process to the greatest extent possible.
 - Production of tangible benefits early on in the collaboration.
 - Promotion of solutions that are both environmentally, technically and financially sound.
 - External partner efforts act primarily as catalysts for community-driven decisions.
7. Promote the judicious selection and implementation of marine sanctuaries.
 - Poaching can undermine community support for a sanctuary. Therefore, surveillance and enforcement of rules are crucial to a sanctuary's viability.
 - The results of ecological monitoring are important to ensure continuing community support. Steps should be taken to ensure that monitoring records are made available to all resource users.

Another observation possibly relevant to turtle resource management is the suggestion that, "purely centralized or purely community-based systems are unlikely to succeed in addressing the challenges facing coastal resource in the Pacific. Rather co-management systems capitalizing on each partner's comparative advantage may be needed."

20. CORRESPONDENCE TO THE GOVERNOR OF SONSOROL STATE FROM THE COMMUNITY CONSERVATION NETWORK REGARDING PROPOSALS FOR SEA TURTLE MARICULTURE FOR "HEADSTARTING" ON MERIR ISLAND – 2001

In this letter, Sonsorol's Governor receives an answer to her request for information on Sonsorol's current approach to sea turtle mariculture as a conservation and management strategy (Community Conservation Network 2001). Information and recommendations were provided. Recommendations included: 1) seek advice and information from other sea turtle biologists (including those directly involved

in the terminated hawksbill mariculture project in Palau), and 2) consider monitoring the scale and impact of harvesting adult (often nesting) turtles from Merir Island and its waters.

21. DRAFT REGULATIONS GOVERNING ENDANGERED AND THREATENED SPECIES – 2001

Proposed regulations to the Palau Endangered Species Act (Palau ESA) identify five (5) sea turtle species in need of official protection, including hawksbill and green turtles, and lists these species within the Palau ESA as “endangered and threatened” species (Anonymous 2001). This draft prohibits the harvest of sea turtles, except for *bona-fide* traditional purposes and in cases in which take does not have any appreciable adverse effect on the breeding population of the species in question within the geographic area where take occurs.

Draft regulations proposes that authorized sea turtle take for exempt purposes require written exemption from Palau’s Minister of Resource and Development, specifying the following:

1. the individuals authorized to take the specimen, the approved species
2. the number of specimens that may be taken
3. any restrictions on the age or gender of specimen
4. the location of where the specimen(s) may be taken
5. the approved traditional method of taking the specimen(s)
6. the approved use of the specimen(s)
7. Additional requirements, including public education.

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APPENDIX 3

DISCUSSION PAPER ON RECOMMENDED MANAGEMENT MEASURES FOR ENHANCING SEA TURTLE RECOVERY, CONSERVATION, AND MANAGEMENT IN THE REPUBLIC OF PALAU

Prepared by the Palau Conservation Society,
June 2000

In Palau, there is a growing sense of concern among our citizens, resource managers, and leaders of the need to improve the management and regulation of our resident sea turtle populations. For many decades we have gradually witnessed our populations of sea turtle species decline without any effective means of reversing this trend. Given the special importance of sea turtles within Palauan society, the Palau Conservation Society wishes to begin a process by which concerns and suggestions related to the management of Palau's sea turtle populations can be raised and addressed.

The protection and regulation of sea turtles in the Republic is important; we need national policy that is both biologically sound and culturally relevant. Numerous suggestions have been made which may help us improve this situation, but few if any of these have been discussed publicly or implemented at neither national nor local levels. A list of several topics has been developed from preliminary interviews with Palauan citizens and recommendations from local, regional, and global reports (see reference list below).

These topics and recommendations are as follows:

A) FOR PALAU TO REDUCE THREATS TO SEA TURTLES, TO INCLUDE:

- **Eliminating or reducing direct harvest through appropriate measures.**
 - Review and revise existing legislation to a) eliminate current inadequacies, and b) increase governance and control over sea turtle harvest and use, while maintaining a focus on the important roles played by cultural values.
 - Enhance enforcement effectively to discourage, punish, and prevent illegal take of turtle.

- Eliminate all commercial sale of turtle products.
- Promote the development of protected areas that serve to protect nesting beaches and eggs.

- **Protecting nesting beaches and other critical marine habitat from incompatible development or degradation.**

- Reduce or eliminate potentially negative modification of and disruptive human activities on known nesting beaches (*e.g.*, detritus cleaning of beaches in the Rock Islands, construction, sand mining).
- Reduce negative impacts to seagrass beds, coral reefs, and other critical habitat.
- Develop and implement effective management plans to protect known nesting beaches and other critical marine habitat.

- **Minimizing or reducing other indirect threats to turtles [*e.g.* pollution, incidental take, alien predators].**

- Attempt the eradication of rats and other alien predators (dogs, pigs, rats) from known nesting areas, where feasible.
- Formalize study of incidental take within off- and near-shore fishing operations.

B) CONDUCT RESEARCH TO MONITORING STATUS OF TURTLE POPULATIONS, TO INCLUDE:

- **Identifying nesting populations and migration through genetic analysis and tagging.**
 - Develop or encourage research programs to identify nesting populations of hawksbills turtles in the Rock Islands and nesting green turtles in the Southwest and Main Palau Islands.

- Develop or encourage research programs to identify migration patterns of hawksbills and green turtles in the Southwest and Main Palau Islands.
- **Estimating and monitoring population numbers and turtle use over time.**
 - Design and implement sustainable, cost-effective monitoring programs that provide resource managers and decision makers with appropriate levels of information for adaptive, long-term management.
 - Develop a centralized sea turtle monitoring center that maintains centralized, geographically referenced records of nesting, population numbers, and turtle use.
 - Monitor the impact of conservation and management efforts and projects with indicators linked to program objectives.

C) OTHER

- **Developing effective education and enforcement measures.**
 - Work with environmental (and other related) educators to communicate important messages of sea turtle biology and conservation to all sectors of Palauan society.
 - Consider new management approaches, including variations of co-management that de-centralize management authority.
- **Support long-term conservation and biologically-viable management.**
 - Build institutional and individual capacity within Palau to undertake long-term sea turtle research and adaptive-manage-

ment programs.

- Actively pursue participation in and collaboration with the SPREP Regional Marine Turtle Research and Conservation Program and other sea turtle or related management programs.
- Consider joining international conventions (e.g., CITES, CMS) to support the long-term management and conservation of shared turtle stocks and highly migratory and endangered species.

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APPENDIX 4

FACTS AND INFORMATION ON PALAU'S SEA TURTLES (Information Presented During Stakeholder Consultations)

WORLDVIEW

There are seven species of sea turtles in the world. These seven marine reptiles are known as the hawksbill, green, leatherback, loggerhead, olive ridley, kemp's ridley, and flatback turtles.

Sea turtles live and nest throughout the world's warm tropical and sub-tropical regions; however, the loggerhead and leatherbacks can be found in cooler climates as well.

Once abundant throughout the world's oceans, biologists more and more began to notice dramatic, worldwide declines in turtle populations during the past century. As a result of this decline, most turtle species have been classified as threatened with extinction throughout their range by various species monitoring organizations and agencies. These slow reproducing animals are classified universally "endangered" by the International Union for the Conservation of Nature (IUCN) and are included in the "most endangered" listing (Appendix 1) of the Endangered Species Trade Convention (CITES).

PALAU

In Palau, the hawksbill and green turtle are the most common species, being the only two that nest on Palau's beaches. Other species, the leatherback, loggerhead, and olive ridley, occasionally pass through Palauan waters. Turtles are used in Palau as a source of food and are important to our traditions and culture.

With regard to population numbers, local interviews with individuals, fishermen, and officials indicate that residents nearly all agree that nesting numbers and the average size of turtles has reduced significantly in Palau during their lifetimes. We have followed rules and regulations in regards to turtles, we have tried to use turtles within our cultural setting, but apparently, still our turtle populations in Palau are declining. Those who are most knowledgeable of this decline have offered many observations and suggestions which may be useful in helping to improve this situation.

GREEN TURTLES

Green turtles (*melob*) can be found throughout Palau. Nesting occurs in low numbers in the Republic but is especially high at Merir in the Southwest Islands and at Ngeruangel in Kayangel. Green turtles eat mainly sea grasses and algae and can grow as large as 47 inches long and weigh 400 pounds. Green turtles can live to be as old as humans but wait 20–35 years to lay eggs. They are generally between 32–37 inches in shell size before they begin to nest.

Most green turtles migrate from distant foraging grounds to their nesting beaches to lay eggs on a regular basis, between 2 to 8 years after their last breeding. Green turtles nest 3–5 times during a nesting year, separated by 13–15 days. Green turtles generally lay about 100 eggs per nest, although this number can vary. Scientists believe that natural 'imprinting' at the specific beach where they were born is an important process that allows sea turtles to return to the beaches where they were born. Estimations indicate between 1 to 10 eggs out of 1,000 will survive to become adult turtles.

Knowledgeable sources indicate that green turtles have declined significantly throughout the Palau. From estimation of accounts at the most other locations in Palau, the green turtle nesting population is estimated as little more than 125 females a year.

HAWKSBILL TURTLES

Hawksbills (*ngasech*) are also found throughout Palau waters, but tend to nest mostly in the Rock Islands. They can grow to about 37 inches weighing 145 pounds and survive mostly on a diet of sponges. Size at first nesting for the hawksbill is generally around 23–29 inches. The hawksbill is valued mostly for its thick shell.

Like green turtles, the hawksbill migrate from distant foraging grounds to their nesting beaches to lay eggs on a regular basis, between 2 to 8 years after their last breeding. They nest 3–5 times during a nesting year, separated by 13–15 days. The Palauan hawksbill generally lays an average of about 130 eggs. Natural

'imprinting' the specific beach where they were born is also thought to be an important process for the hawksbill turtle that allows sea turtle to return to the beaches where they were born. Estimations indicate between 1 to 10 eggs out of 1,000 will survive to become adult turtles.

Current field estimates point to as few as 20 nesting female hawksbills a year in Palau (50–60 in the most favorable conditions) and perhaps no more than a few hundred nesting a year in all of Micronesia.

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DISCUSSION TOPICS RELATED TO THE USE OF TURTLES IN PALAU

We have followed rules in regards to turtles, we have tried to use turtles within our cultural setting, but still the turtle populations in Palau are declining. Numerous observation and suggestions have been made which may be useful in helping to improve this situation. However, few if any of these have been discussed publicly or among interested groups. We present the following questions or statements to encourage discussion on topics relevant to helping improve the management of sea turtles in Palau.

FOR DISCUSSION:

For both species:

- What do we most value turtles for?
- Too many turtles (both *melob* and *ngasech*) are being harvested.
- Turtle rules and regulations have proven difficult to enforce.
- Too many eggs are taken from nests.
- Places where turtles nest are becoming unsuitable and disturbed by different things.
- There is not enough information on the status and migration of Palauan turtle populations for managers... and there is little information for the public.

Specifically for *melob*:

- More and more green turtles are being transported from the Southwest Islands to Koror while their nesting population is in decline.

Specifically for *ngasech*:

- Continued harvest of *ngasech* is likely, scientists say, to deplete the current population and lead to extinction.

Box A4-1. Sample discussion topic sheet developed with the guidance of Noah Idechong.

APPENDIX 5

PALAU SEA TURTLE POLICY REVIEW: INTERVIEW AND DISCUSSION GROUP PARTICIPANT LIST

Group/Interviewee	Date	Individuals Present
Sonsorol State Government	May 16, 2000	Luara Ierago, Governor; Sonsorol Lieutenant Governor; Michael Guilbeaux
Julita Tellei, Palau Resource Institute	May 17, 2000	Julita Tellei, PRI; Michael Guilbeaux
Koror State Government	May 17, 2000	Adalbert Eledui, Director of Marine Enforcement and Conservation; Michael Guilbeaux
Emilio Basilius, Coral Reef Research Foundation	May 19, 2000	Emilio, CRRF; Michael Guilbeaux
Kammen Chin, Division of Conservation and Entomology	May 22, 2000	Kammen Chin; Michael Guilbeaux
Macarthy Katoro, Division of Marine Resources	May 24, 2000	Macarthy Katoro; Michael Guilbeaux
Theo Isamu, Chief, Division of Marine Resources	May 24, 2000	Theo Isamu, Chief of Marine Resources; Michael Guilbeaux
Peter Black, George Mason University	June 14, 2000	Peter Black; Michael Guilbeaux
Natural Resource Managers Group	June 15, 2000	Kammen Chin; Theo Isamu; Ada Eledui; two National Conservation Officers; Noah Idechong; Ileb Olkeriil; Michael Guilbeaux
PCS Staff meeting	June 19, 2000	Klou; Charels; Ileb Olkeriil; Umiich Sengebau; Joules; Kristin; Linda; Michael Guilbeaux
Charles Freeman, PCS	June 20, 2000	Charles Freeman; Michael Guilbeaux
Tom Graham, PCS	June 22, 2000	Tom Graham; Michael Guilbeaux
Southern Lagoon Fishermen	June 23, 2000	Martin & Olsingch; Umiich Sengebau; Michael Guilbeaux
Sonsorol Community Group	June 23, 2000	Lawrence Ierago, Chief of Merir; Mariano Carlos, Chief of Fana; Valentine Tirso, Sonsorol State Legislature; Kuterbis Kuturmalei, Chief of Pulo Anna; Laura Ierago, Governor of Sonsorol; Salvador Kintaki; Nicholas Aquino; Marcelino Xavier; Sumer Albis; Mario Pedro; Josie Kintaki; Michael Guilbeaux; Umiich Sengebau; Also in attendance from the Sonsorol Community were about 5 other women and children.
Hatohobei Community Group	June 27, 2000	Rosanna; Sabino; Julie; Dominic; Maximo; Francis; Domininio; Sabina's brother; Marcus' Mother; Rose; Young mother with child; Lorenzo; Albino; Sabina; Michael Guilbeaux
Andrew Smith, TNC	July 5, 2000	Andrew Smith; Michael Guilbeaux
Francois Martel, SPREP	July 6, 2000	Francois, SPREP; Andrew Smith; Tom Graham; Michael Guilbeaux
Ngerbeched Women's Group	July 6, 2000	Baulina Towai; Modesta; Towai; Naomi Mobed; Nona Luil; Naomi Isimang; Itong Riumd; Isaol Remengeosau; Bedebii Franz; Aileen Ngirangesil Bartolang; Nobuko Blaluk; Chereong; Ilengei; Michael Guilbeaux

(continued next page)

Group/Interviewee	Date	Individuals Present
Ricky of Ngiwal	July 7, 2000	Ricky; Umiich Sengebau; Michael Guilbeaux
Titus of Ngiwal	July 7, 2000	Titus; Umiich Sengebau; Michael Guilbeaux
Yas of Ngiwal	July 7, 2000	Yas; Umiich Sengebau; Michael Guilbeaux
Ngiwal Community Group	July 10, 2000	Krispin Termeteetk, Governor; Francisco Melaitiau, Legislator; Riumd Moses Sam; Riomet Angelo Udui; Vincent Ito; Miriram Timarong; Deborah Along; Ronald Timarong; Wanda Ngirameketii; Umiich Sengebau; Michael Guilbeaux
Ngeremlengui Fishermen Group	July 12, 2000	Hideo Rdialul; Lazarus Samserui; Pasqual; Adelbai Franz; Clinton M.; Serio Olkeriil; Umiich Sengebau; Ileb Olkeriil; Joyce; M. Guilbeaux
Andres Nicholas of Hatohobei	July 13, 2000	Andres Nicholas; Michael Guilbeaux; Umiich Sengebau
Kathy Kesolei	July 14, 2000	Kathy Kesolei; Umiich Sengebau; Michael Guilbeaux; Aunchalee Loscalzo
Bilung and Nancy Wong	July 17, 2000	Bilung; Nancy Wong; Michael Guilbeaux; Umiich Sengebau; Ileb Olkeriil
National Marine Surveillance Program	July 18, 2000	Fisheries observers/surveillance; Michael Guilbeaux; Umiich Sengebau
Herbert Decherong, Director of Marine Law Enforcement	July 18, 2000	Herbert Decherong; Michael Guilbeaux; Umiich Sengebau
Environmental Educators Group	July 18, 2000	Noe; Carol Emaurois; Pearl; Rose; Michael Guilbeaux; Ileb Olkeriil; Joyce
Florencio Gibbons, Palau Society of Historians	July 19, 2000	Florencio Gibbons; Michael Guilbeaux
Tiare Holm	July 20, 2000	Tiare Holm; Michael Guilbeaux
Kayangal State Office	July 22, 2000	Kayangal State Office Personnel; Michael Guilbeaux; Umiich Sengebau

APPENDIX 6

LEGISLATION AND REGULATIONS RELEVANT TO SEA TURTLE MANAGEMENT IN THE REPUBLIC OF PALAU

Statutes that promote the protection of sea turtles in the Republic of Palau exist at national and state levels. Customary or government-created management areas may also offer protection to turtles in Palau that either directly or indirectly protect sea turtles or their habitat. Examples of these are included below:

NATIONAL LEVEL LEGISLATION:

Limitations on the Taking of Turtles

Palau National Code: Chapter 12 Protected Sea Life Subchapter I: Turtles

§1201. Limitations on the taking of turtles:

- a) No hawksbill turtles or sea turtles shall be taken or intentionally killed while on shore, nor shall their eggs be taken.
- b) No hawksbill turtle shall be taken or killed except whose shell is at least 27 inches when measured over the top of the carapace shell lengthwise; no green turtle shall be taken or killed except whose shell is at least 34 inches when measured over the top of the carapace shell lengthwise.
- c) No turtle of any size shall be taken or killed from the first day of June to the thirty first day of August inclusive, nor from the first day of December to the thirty first day of January inclusive.
- d) Notwithstanding any provisions of this section to the contrary, taking of sea turtles and their eggs shall be allowed for scientific purposes when specifically authorized by the president.
- e) A person violating any of the provisions of this section shall, upon conviction, be imprisoned for a period not exceeding six months, or fined not more than \$100.00, or both

Source: Subsections (a) through (d) – 45 TTC §2; subsection (e) – 45 TTC §5; section modified.

National Protected Areas

Two nationally mandated marine protected areas (MPAs) may offer special protection to sea turtles as a result of fishing¹ restriction within boundaries. In addition to providing additional protection to turtles in the water, Ngerukewid Islands Wildlife Preserve (also known as the “70 Islands”) offers additional protection to beach habitat, nesting turtles and eggs. Both of these MPAs are located within the jurisdiction of the State of Koror and are mirrored by similar state level legislation. These include:

- Ngerukewid Islands Wildlife Preserve (12km²): No extraction of any kind, no disturbance.
- Ngerumekaol Spawning Area (.3km²): No Fishing April 1–July 31².

STATE GOVERNMENT PROTECTION:

Additional protection is offered from state legislative statutes specific to turtles and protected areas. The degree to which these statutes are enforced in each state is unclear however, and enforcement is expected to vary greatly throughout the Republic. Examples of sea turtle protection from a marine protected area (Kayangel State) and a state statute (Hatohobei State) are included below.

Ngeruangel Atoll Reserve and the Ngeruangel Management Plan

In Kayangel State, the Ngeruangel Reserve Management Plan, legally enabled through State level legislation, provides full protection to hawksbill turtles and restricts the number and purpose for which green sea turtles can be harvested from Ngeruangel Atoll (35km²).

Turtles: to allow the harvest of a limited number of green turtles (*melob* – *Chelonia mydas*) for the specified state functions, only if they are not available from other sites. No hawksbill tur-

tles (*ngasech* – *Eretmochelys imbricata*) are to be taken from the Reserve at any time for any purpose.

Controls:

- Green turtles (*melob* – *Chelonia mydas*) may only be taken for inaugurations of the Governor and Legislature.
- A maximum of only four (4) green turtles per year may be captured within Ngeruangel Reserve, and only in accordance with national laws.
- Four (4) green turtles is a maximum quota only, and the Governor, in consultation with the Legislature and Chiefs may reduce the number at any time. The quota is not transferable or to be carried-over from one year to the next.
- No hawksbill turtles (*ngasech* – *Eretmochelys imbricata*) are to be taken from the Reserve at any time for any purpose.
- Permits will only be issued by the Governor after consultation with the Legislature and Chiefs. No permit fee applies.

Permit Conditions:

- A maximum of only four (4) green turtles per year may be taken.
- All relevant national laws must be followed.

Hatohobei State Sea Turtle Management Statute

The Hatohobei State Government developed specific legislation to place additional protection on hawksbill turtles. The legislation places a 15-year moratorium on hawksbill sea turtles and prohibits commercial sale of green turtles originating from the State's jurisdiction. The legislation provides for penalties of a fine no more than \$100 and/or 90 days imprisonment for each violation.

THIRD HATOHOBELI STATE LEGISLATURE
HSPL NO. 3-16
SIXTH REGULAR SESSION, FEBRUARY, 1995
HSL BILL NO. 3-6-1,D2

AN ACT

To regulate the taking of sea turtles, to repeal Public Law Nos. 20, 34, and 36 in their entirety, to prohibit the removal of turtle eggs from turtle nests, and for other related purposes.

BE IT ENACTED BY THE HATOHOBELI STATE LEGISLATURE:

Section 1. Policy.

It is the sense of the Hatohobei State Legislature to protect and conserve sea turtles, and to prohibit the removal of turtle eggs from turtle nests.

Section 2. Definition.

The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such activity.

Section 3. Prohibition.

(1) No person shall fish for, take, or intentionally kill a Hawksbill turtle (*Eretmochelys imbricata*) in the territory of Hatohobei State for a period of 15 years from the date of this Act.

(2) Subject to 24 PNC 1201 and any other pertinent National laws, no person shall fish for, take, or intentionally kill a green turtle (*Chelonia mydas*) in the territory of Hatohobei State for any commercial purposes.

Section 4. Removal of Turtle Eggs.

No person shall remove green turtle or hawksbill turtle eggs from any turtle nest.

Section 5. Penalty.

Any person violating any provision of this act shall be subject to a fine of not less than \$100.00 or imprisoned for not more than ninety (90) days or both for each such violation.

Section 6. Repeal.

Hatohobei State Public Law Nos. 20, 34 and 36 are hereby repealed in their entirety by this Act.

Existing State MPAs

Some state or village level MPAs currently in effect offer a degree of protection to sea turtles as a result of fishing restriction within boundaries. These include:³

- Ngerukewid Islands Wildlife Preserve, Koror (12km²)
- Ngerumekaol Spawning Area, Koror (.3km²)
- Ngarchelong/Kayangel reef channels (90km²): No Fishing April 1–July 31
- Ngemelis and Dmasch Islands Zones, Koror

- (30km²): No fishing
- Ngemai Conservation Area (1km²): No fishing
 - Ngardmau Conservation Area System (7km²): No fishing
 - Ebiil Channel Conservation Area, Ngarchelong (15km²)

¹ Used as a guide for the meaning of “fishing” related to turtles, the Palau National Code 27 PNCA §1203, states that “fish” as a noun, means any species of ani-

mal, other than birds, which lives in the sea. Likewise “to fish” means to catch, take, or harvest fish, or to attempt to take, catch, or harvest fish using any method what so ever.

² Adapted from *Conservation Areas of Palau* a fact sheet produced by the Palau Conservation Society. Printed 11/2000

³ Adapted from *Conservation Areas of Palau* a fact sheet produced by the Palau Conservation Society. Printed 11/2000.

APPENDIX 7

RECORDED SEA TURTLE NESTING ACTIVITY IN THE REPUBLIC OF PALAU 1992–2000: ADDITIONAL INFORMATION ON HAWKSBILL NESTING IN THE ROCK ISLANDS

Consultation with various individuals, organizations, and national and state agencies on recorded sea turtle nesting in Palau provided limited information. Very few records of local observations were available, as most nesting information had been collected with the assistance of outside scientists (Table 5-1). Those consulted included the Division of Marine Resources; Division of Conservation and Entomology; the Palau Conservation Society; the Koror, Kayangel, Hatohobei, and Sonsorol State Governments; The Nature Conservancy; and relevant individuals.

In 1992, information was reported on various beaches with relevance to sea turtle nesting in Palau (Maragos 1992). These findings, while important because they are the only reported importance measures of their kind, should be viewed within the limitations of methods of observation and recording¹. This

is particularly true in the case of the Rock Islands where many beaches may go unmonitored and nesting events unreported. Madriasau recorded observations of hawksbill nesting activity in the Rock Islands as part of the routine operations of the MMDC turtle mariculture project and are summarized in various reports (see Maragos 1992). Surveys of nesting beaches based on nightly observations (Atkinson and Guilbeaux 1992; Guilbeaux *et al.* 1994) provide an additional perspective on hawksbill nesting in the Rock Islands, albeit recorded over short durations on specific nesting beaches (Map A7-1 and Table A7-1). Combined recorded observations for seven months during 1992 give an indication of the level of hawksbill nesting at seven Rock Island beaches or island groups (Table A7-2).

Map A7-1. Map and Coding of Koror Rock Island Beaches Surveyed by Atkinson and Guilbeaux 1992 and Guilbeaux *et al.* 1994, Republic of Palau (Adapted from Sato and Madriasau, nd).

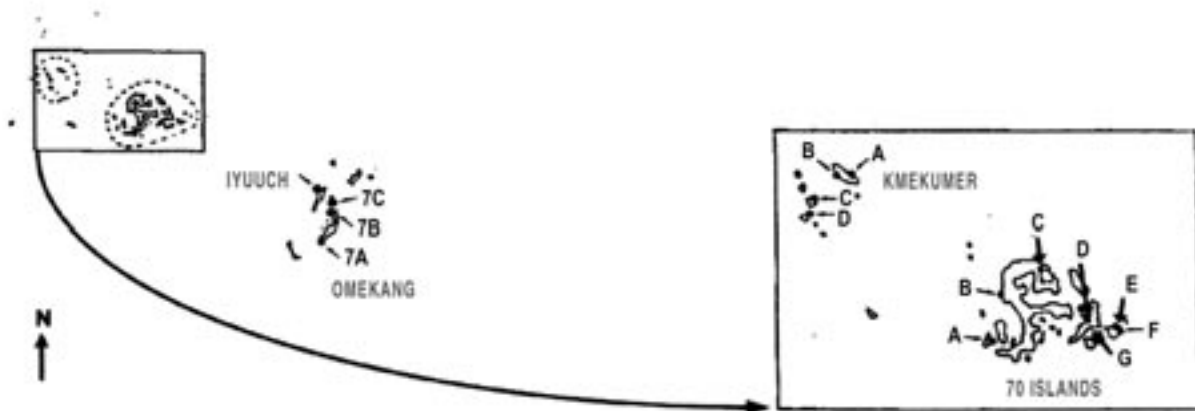


Table A7-1. Summary of Rock Island Hawksbill Nests Recorded During 1992 and 1994 (Atkinson and Guilbeaux 1992; Guilbeaux et al. 1994).

Beach ²		Jun. 16 – Jul. 28, 1992 25 patrol days/nights		Feb. 1 – Mar. 24, 1994 46 patrol days/nights		Total Laid	Total Poached ³
		Nests Laid	Nests Poached	Nests Laid	Nests Poached		
Kmekumer Group	a	0	0	0	0	0	0
	b	0	0	1	1	1	1
	c	1	1	4	0	5	1
	d	5	0	1	1	6	1
Ngerukewid Group	a	1	0	3	1	4	1
	b	0	0	1	0	1	0
	c	0	0	3	0	3	0
	d	0	0	1	0	1	0
	e	1	0	2	0	3	0
	f	0	0	3	0	3	0
	g	0	0	0	0	0	0
Omekang ⁴ Group	a	1	0	n/a	n/a	1	0
	b	0	0	n/a	n/a	0	0
	c	1	1	n/a	n/a	1	1
Iyuuch		2	1	n/a	n/a	2	1
Totals		12	3	19	3	31	6

Table A7-2. Number of Assumed Hawksbill Turtle Nests, Observed in the Rock Islands: January – July 19925 (Source: MMDC Turtle Hatchery and Atkinson and Guilbeaux, 1992).

Location	Number of Nests
1. Ngebedangel	4
2. Kmekumer	7
3. Ngerukewid	6
4. Iyuuch	2
5. Omekang	7
6. Ngkesiil	5
7. Nigurgomel	3
Total	34

¹ Limitations include inconsistent beach visitation by project staff, irregular monitoring of nesting beaches, and unreported nesting.

² Beach Group letter adapted from Sato and Madriasau, n.d. (see Map A7-1).

³ Poaching level during these surveys were likely to be significantly reduced by the occasional covering of turtle crawls (tracks) and nest, and general presence of researchers.

⁴ Beaches of the Omekang Island group (and the

beach at Iyuuch) were only surveyed for four (4) nights during the 1992 monitoring; Omekang beaches were not surveyed as part of the 1994 monitoring effort.

⁵ Monthly surveys were also believed to be conducted at Biduil, Ulong, Kisaks, Ngeremdiu, Bereu, Ngeremeyaus, Moir, Nguruuawch, Oiyars, Suuch, Telluolius, Ngerechong, and Ngemelis beaches. No nests were recorded during this period.

APPENDIX 8

RECOMMENDED MODEL RECOVERY STANDARDS AND PRIORITY ACTIONS FOR THE ENHANCEMENT OF CONSERVATION AND MANAGEMENT OF SEA TURTLES IN THE REPUBLIC OF PALAU

The following set of recommendations—intended to serve as a guide for the development of recovery standards for sea turtle populations within the Republic of Palau—contains model goals, criteria, and actions that could be developed into a detailed sea turtle management and recovery plan for Palau. The proposed goal, criteria, and rationale behind those criteria, have been adapted from those developed for the Recovery Plans for U.S. Pacific Hawksbill and Green Turtle Populations (NMFS and USFWS 1998a, 1998b). Using the best contemporary information available and a precautionary approach, the standards and actions that follow were designed to provide the highest chance of recovery and stability for Palau’s remaining sea turtle populations.

Note: Many of the criteria and activities proposed within this framework, although they may be considered to be ambitious, provide a comprehensive and rigorous strategy for ensuring the best opportunity for recovery of Palau’s sea turtle populations. The attainment of proposed recovery goals are based on quantitative biological measures, as well as other recovery indicators. For this reason, the recommendations that are presented here should be considered a critical part of long-term program objectives.

1. MODEL RECOVERY GOAL:

To recover, conserve, and perpetually maintain Palau’s sea turtle populations at healthy, stable, biologically viable levels, relying on management activities, information, and responses.

2. CRITERIA FOR RECOVERY, CONSERVATION, AND MANAGEMENT SUCCESS¹:

All of the following criteria are considered necessary to effect a reduction or elimination of threats and the recovery and stable status of all sea turtle populations in Palau.

- All stocks found in Palau waters need to be identified and related to their respective source beaches according to reasonable geographic parameters².
- Each stock must average a biologically sound number of Females Estimate to Nest Annually (FENA) over a six-year period, based on the goal of maintaining a stable population perpetually³.
- Nesting populations at “source” beaches are either stable or increasing over a twenty-five (25) year monitoring period.
- Foraging populations are exhibiting statistically significant increases at several key foraging grounds within each stock region.
- Existing foraging areas and nesting beaches are maintained unpolluted, unchanged, healthy environments.
- All Priority 1 Actions⁴ proposed for Palau have been implemented (see 3. Suggested Priority Actions below, as adapted from NMFS and USFWS Pacific Sea Turtle Recovery Plans [NMFS and USFWS 1998a, 1998b]).
- A threats-based assessment indicates that all major threats have been eliminated or significantly reduced.
- A national management plan designed to maintain sustained populations of turtles is adopted and implemented. This plan and associated program should have clear means of evaluating the impact of the program.
- Formal cooperative relationships are established between all existing regional sea turtle management programs (e.g., SPREP’s Regional Marine Turtle Research and Conservation Programme).
- International agreements are in place to assist with the protection of shared stocks and endangered or highly migratory species (e.g., International Indian Ocean – SE Asia Sea Turtle Management MOU).

Rationale behind Criteria:

Determining quantifiable values that can be used to determine when a sea turtle stock is recovered and when threats to it are significantly reduced is quite difficult. The above criteria are based on the best available information with the following conceptual guidelines.

- The minimum nesting stock must equal a size that could not be easily eliminated by a single catastrophic (“natural” or “human-induced”) event.
- Nesting population trends should be long enough to minimize the effects of natural fluctuations in numbers that are characteristic of sea turtle populations. Generally, this time period is equal to the species estimated generational time⁵.
- Habitats are adequate in range and quality to support population growth and recovery once other threats have been reduced or eliminated.

3. SUGGESTED PRIORITY ACTIONS:

The following list of Suggested Priority Actions for Sea Turtle Recovery in the Republic of Palau is adapted from the list of Priority 1 Actions of the U.S. Pacific Sea Turtle Recovery Plans for both hawksbill and green turtles. Priority 1 Actions contained within the Implementation Schedules of the USFWS Plans were presented as comprehensive and technically sound list of actions “that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future” (for examples, see NMFS and USFWS 1998b: 73). The management and research actions in the Suggested Priority Actions for Palau contain modifications and additional deemed important for local conditions and/or programs.

LIST OF SUGGESTED PRIORITY ACTIONS FOR SEA TURTLE RECOVERY IN THE REPUBLIC OF PALAU

Detail of Priority 1 Actions List

Below is a step-down list and details of suggested Priority 1 Actions modified for Palau, based on gen-

eral action categories within NMFS and USFWS 1998a and b.

A. Protect and manage turtles on nesting beaches

A1. Eliminate direct take of nesting turtles and their eggs⁶.

- Reduce directed take of nesting turtle and their eggs through public education and information.
- Increase enforcement of laws protecting turtles—preventing illegal exploitation and harassment.
- Ensure coastal that all construction or other human activities avoid disruption of nesting and hatching activities (see A3 below).
- Reduce nest predation by domestic and feral animals.
- Curtail the collection of eggs for mariculture (sea turtle “headstarting”) purposes due to this activity’s potentially adverse affects on overall turtle reproduction and lifecycles⁷.

A2. Collect biological information on nesting populations.

- Monitor nesting activity to identify important beaches, to determine the number and survivorship rates of nesting females, and to determine population trends.
- Evaluate nest success and hatchling survivorship, implement nest-protection measure on important nesting beaches.
- Define stock boundaries for Palauan sea turtles.
- Identify stock type for major nesting beach areas.
- Determine nesting beach origins for juvenile and sub-adult populations.
- Determine genetic relationships among populations.

A3. Protect and manage nesting habitat.

- Develop and implement beach landscaping and maintenance guidelines (e.g., to reduce disruptive lighting, prevent removal or modification of native vegetation, etc.).
- Mitigate degradation of nesting habitat caused by all forms of construction with potentially negatively impacts, including sea-

walls, jetties, buildings with adverse lighting or other similarly adverse structures.

- Eliminate sand or coral rubble removal, and mining practices.

B. Protect and manage turtles in the marine environment

B1. Eliminate directed take of turtles in marine environment⁸.

- Reduce directed take of turtles through public education and information.
- Increase enforcement of laws protecting turtles—preventing illegal exploitation and harassment.
- Ensure coastal activities avoid disruption of foraging and other turtle activities in the marine environment.

B2. Collect information on the distribution, abundance, status in marine environment⁹

- Determine distribution and abundance of post-hatchlings, juveniles, and adults.
- Determine adult migration routes and inter-nesting habitats.
- Identify current threats to adults and juveniles on foraging grounds.
- Monitor and reduce incidental mortality in commercial, artisanal, and recreational fisheries.

B3. Protect and manage marine habitat, including foraging habitat.

- Ensure long-term protection of marine habitat.

C. Legislation, national capacity building and international cooperation

C1. Develop national capacity for research and data collection and management.

- Review and revise existing legislation to 1) eliminate current inadequacies, and 2)

increase governance and control over sea turtle harvest and use, while the same time maintaining cultural values to the greatest degree possible.

- Explore co-management arrangements that share responsibility for decision-making and enforcement between national and all other levels of governance.
- Support precautionary and adaptive management approaches.

C2. Develop national capacity for research, data collection, and management.

- Develop a centralized coordination unit to assist with the organization of turtle management, research, tagging, and record keeping.
- Acquire national training in basic sea turtle research skills.

C3. Promote international and regional cooperation.

- Support existing agreements and/or conventions that protect sea turtles in foreign waters.
- Encourage ratification of the CITES membership compliance.
- Develop new agreements to protect all lifestages of turtles in foreign waters.
- Assist with information exchange and distribution.

D. Other high priority actions

- Once genetic relationships have been determined, estimate numbers of FEMA for each Palau stock required for long-term population viability¹⁰.
- Analyze and assess type and scale of potential sustainable harvest, if any¹¹.
- Design a threat-based impact analysis¹² and collect baseline information for long-term program monitoring and evaluation.

¹ This list of general criteria was developed by a team of sea turtle scientists and technical advisors during the formulation of NMFS and USFWS Pacific Sea Turtle Recovery Plans (NMFS and USFWS 1998a, 1998b) to provide indicators of success in identifying conditions of sea turtle population recovery, stability, and long-term viability (e.g., conservation) with reasonable confidence, based on the best information available and a precautionary approach to management. Additional logic and information on the general list of criteria is found in the next section “Rationale behind Criteria” adopted from NMFS and USFWS 1998a, 1998b.

² The word “stock” here defines a collective group or population of turtles that interbreed and nest in a particular distribution of “source beaches”. Usually these stocks can be defined by the similarity of genetic profiles. Some stocks of turtles nest in Palau and thus have source beaches within the Republic; other stocks nest in foreign nation states, but migrate to forage in or pass through Palauan waters.

³ For general Pacific stocks, NMFS and USFWS Pacific Sea Turtle Recovery Plans suggest an estimated 5,000 FEMA (or a biologically reasonable number of FENA based on the goal of maintaining a stable population in perpetuity) for each stock over six years. Specific targets for Palau stocks have yet to be considered or proposed.

⁴ Derived from a list of Priority Actions (in implementation schedules) suggested by NMFS and USFWS Pacific Hawksbill and Green Turtle Recovery Plans (see NMFS and USFWS 1998b, p. 73-84 for examples).

⁵ Generations are calculated as the age at sexual maturity plus half of reproductive longevity (Pianka, 1974). For example, Meylan reports estimates of age-at-maturity for wild marine turtles are high for hawksbills, ranging from 20 to 40 years (Boulon 1983, 1994; Limpus 1992, pers. comm.; Mortimer 1998; all in Meylan 2001). The IUCN / SSC Marine Turtle

Specialist Group conservatively estimates generation time in hawksbills to be 35 years, based on growth and reproductive longevity data from around the world (Meylan and Donnelly 1999).

⁶ Direct take of nesting sea turtle and eggs is identified as a primary threat to sea turtles in the region by NMFS and USFWS Pacific Sea Turtle Recovery Plans (NMFS and USFWS 1998a, 1998b).

⁷ The current case of a proposed green turtle mariculture facility on Merir Island is highlighted here, where the collection of eggs for sea turtle mariculture has a great potential to disrupt natural reproduction cycles.

⁸ Directed take of sea turtles in the marine environment is identified as a primary threat to sea turtles in the region by NMFS and USFWS Pacific Sea Turtle Recovery Plans (NMFS and USFWS 1998a, 1998b).

⁹ The Priority 1 Actions: 1) Determining growth rates and survivorship of hatchlings, juveniles and adults, and, age at sexual maturity; 2) Investigating green turtle fibropapilloma disease (NMFS and USFWS 1998a, 1998b) were demoted from the list of Priority 1 Actions suggested for the Republic of Palau. Evaluating the survivorship of hatchlings on nesting beaches has been included under Category A2 in the Palau Priority 1 Actions List.

¹⁰ The identification of appropriate FEMA estimates required to maintain healthy stable biologically-viable populations will be necessary for Palau turtle stocks based on local conditions. Expert opinion will be required for this task.

¹¹ It is frequently suggested that an allowable take of turtle species be maintained in Palau based on customary use. The determination of a biologically sustainable level of take of Palau’s sea turtle populations—if any, given current conditions—needs to be assessed. This task will require expert opinion.

¹² Using an approach for monitoring project impact and measuring conservation success. See Salafsky and Margoluis (1998) or TNC (2000) for examples.

APPENDIX 9

MAP AND PHOTOS

Map 1. Map of the Republic of Palau (adapted from the Palau Conservation Society)

REPUBLIC OF PALAU

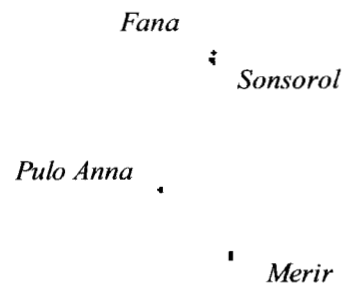
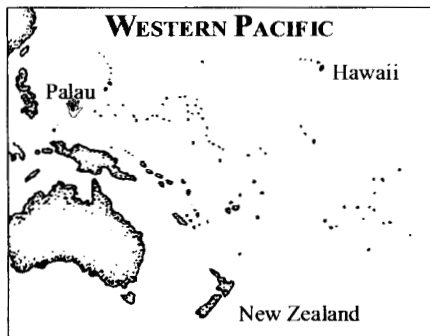


Photo 1. Nesting green turtle, Helen Island, Palau (2000).



Photo 4. Off-loading green turtle from the Southwest Islands, Malakal, Koror (2000).



Photo 2. Green turtles captured for government function (1994).



Photo 5. *Toluk* money plates for sale at a gift shop in Koror, Palau (2000).



Photo 3. Green turtles transhipped from Southwest Islands to Koror, Palau (2000).



Photo 6. Turtle shell jewelry for sale, Airai, Palau (2000).



Photo 7. Tortoise shell jewelry and *toluk* for sale, Koror, Palau (2000).



APPENDIX 10

PROJECT TERMS OF REFERENCE

This appendix contains the project Terms of Reference prepared by the National Marine Fisheries Service (NMFS), Pacific Islands Area Office (PIAO).

PALAU TURTLE RECOVERY, CONSERVATION AND MANAGEMENT IMPLEMENTATION REPORT

Goal: Undertake and document turtle recovery, conservation and management efforts in the Republic of Palau.

Background: There have not been any substantial efforts at implementing the turtle recovery plan for Pacific populations of hawksbill and green sea turtle (NMFS and USFWS 1998a, 1998b) in the Republic of Palau. A draft of a sea turtle conservation plan for the Republic of Palau was prepared in 1992 (Maragos 1992) but not completed. None of the suggested or recommended recovery and management measures found in either document have been vetted or endorsed at the community level. In order for the suggested measures to gain credence with relevant stakeholders, efforts will be required to develop a consensus on appropriate management measures for turtles in Palau. The National Marine Fisheries Service (NMFS), Pacific Islands Area Office (PIAO) seeks to begin such a process. Additionally, it seeks to compile relevant data and recent (1992-1999) information on the status of the green and hawksbill turtle populations in Palau.

Statement of Work:

Part I

Compilation and Documentation of Current Information and Community Perceptions.

Task 1. Using (NMFS and USFWS 1998a, 1998b) and (Maragos 1992), the Contractor shall complete a review and appraisal of turtle research specific to Palau and review recommended management

options, alternatives, or modifications to the current regulatory framework in Palau. This review should include, at a minimum, information from libraries, regional management bodies or non-governmental conservation organizations. This review shall result in an annotated list of recommended management alternatives for enhancing the recovery, conservation and management of turtles in the Republic of Palau. The information obtained during this task shall be used in a community consultative and educational process (detailed below) and shall be included in the final report. Alternatives shall be translated for presentation in the Palauan language.

Task 2. The Contractor shall conduct at least seven (7) community-based meetings with women's groups, fishermen, community leaders (elders, etc.), both traditional and modern, legislators, resource managers and other interested parties to: (1) determine perceptions on turtle resource status, (2) determine the effectiveness of current regulations, (3) determine community perceptions of turtle use, (4) determine the value of turtles in a modern (*e.g.*, economic) and cultural (traditional, spiritual) context, and (5) document views on proposed management alternatives as derived in **Task 1**. The meetings shall be facilitated by an individual versed in the Palauan language and culture and a turtle resource person.

Task 3. The Contractor shall compile and document all available information from Palauan national resource management offices, state or local conservation and management offices, and local non-governmental organizations on current (1992–1999) nesting activity in Palau, including the documentation of all known nesting activity in Palau, including the documentation of all known nesting beaches and the status of those sites (*e.g.*, threats, geological changes, etc.) This compilation shall include, but not be limited to, documents, electronic media and interviews with key or informed individuals. The Contractor shall compile and document the results of the community-based meetings conducted in **Task 2**. A list of all com-

munity meeting participants shall be included as an annex to the final report (see below). This report shall include a synthesis of comments, a determination of areas of consensus and disagreement on the management alternatives presented (as developed in **Task 1**) and recommendations for modification, if necessary, to the Republic's existing regulatory framework, policies (e.g., enforcement), or administrative rules. The compilation of the above information shall be in the form of a draft report provided to the PIAO Administrator for review and comment.

Part II

Education and Outreach

Task 1. Based on the results of **Part I**, in particular, **Task 3**, the Contractor shall develop generic educational and awareness materials for distribution. The focus of these materials shall target elementary and high schools, as well as, visitors to Palau. These materials are to include (but not be limited to: (1) an information sheet, with appropriate graphics, detailing the status of relevant turtle species in Palau, (2) a review of current laws and suggested changes or areas of emphasis for turtle recovery, conservation and management, and (3) a brochure for the distribution with the visitor industry. All materials must be translated for presentation in Palauan, English, Japanese, and Mandarin.

Deliverables:

1. Republic of Palau Turtle Recovery, Conservation and Management Update Report.

A draft final report shall be submitted to the NMFS Pacific Island Area Office 180 days or six (6) months after contract initiation, which covers findings based on the issues identified (Tasks I.1, I.2, I.3 above):

- A draft of the final report in hard copy and electronic format shall be submitted to the NMFS PIAO for review 180 days after the date of initiation of the contract. The report will be reviewed by the NMFS PIAO or its designee, and returned with comments to the Contractor within thirty (30) days.

- The final report, incorporating the reviewers' comments, shall be submitted one (1) month thereafter.
- The final report shall be submitted in both hard copy and electronic form.
- The final report should include such visual aids as are appropriate to illustrate the findings, *i.e.*, maps.
- The final report shall include endnotes referencing the documents consulted and the people interviewed.
- The final report shall include an Executive Summary.
- The final report shall be no more than 100 pages in length, unless pre-approved by the COTR.

2. Education and Outreach.

Copies of all educational materials will be submitted to the PIAO Administrator for review and comment before final printing. Printing is not a requirement of this contract.

Timetable:

Month 1	Research on study begins.
Month 2	Initiate and Complete Community meetings.
Month 4	Draft Final Report submitted to PIAO Administrator.
Month 6	Submit Final Report and Draft Educational Materials to PIAO Administrator.

REFERENCES

- Maragos, J.E. 1992. *Sea turtle conservation plan for the Republic of Palau*. Draft report prepared for the Republic of Palau, Bureau of Resources and Development by The Nature Conservancy, Pacific Region, Honolulu. 39 p.
- NMFS & USFWS 1998a. *Recovery Plan for U.S. Pacific Populations of the Hawksbill Turtle (Eretmochelys imbrata)*. National Marine Fisheries Service, Silver Spring, MD. 82 pp.
- NMFS & USFMS 1998b. *Recovery Plan for U.S. Pacific Populations of the Green Turtle (Chelonia mydas)*. National Marine Fisheries Service. Silver Spring, MD.

**Sea Turtles, Their Management,
and Policy in the Republic of Palau:
An Assessment
of Stakeholder Perception**

Volume II - Record of Consultations on Issues Related to Turtles

November 2001

A Report by the Palau Conservation Society

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SUMMARY RECORD OF CONSULTATION COMMENTS, SUGGESTIONS, AND PERCEPTIONS

During stakeholder group consultations and individual interviews, participants were asked to share their perceptions of a variety of topics related to sea turtle management in the Republic of Palau. Findings included here in Volume II (with heading numbers corresponding to those of the same topic in the main report, Volume I) are intended to provide a record of these topics and discussions for those interested further understanding and investigation of the many issues concerning sea turtle management in Palau¹. Areas of consensus that developed during meetings, or through the consultative process, are identified. Likewise, topics of poor consensus are reported according to participants' varying perceptions or opinions to the greatest degree possible².

4.1 VALUE OF TURTLES IN A MODERN AND CULTURAL CONTEXT

Topics related to the perceived value of turtles were separated into two broad categories. The first category encompasses all aspects that relate to sea turtle value in a modern context. To get an insight into stakeholder perception of the value of sea turtle in a contemporary sense, including economic, nutritional, and other general values, a host of inquiries were answered. The second value category identifies sea turtle value in a historical and cultural context. While this study recognizes the concept of culture as non-static, and as clearly encompassing contemporary phenomena (such as market economies), an attempt was made to distinguish perceptions of attributes that were regarded as localized or Palauan in nature or origin. Therefore, this category focuses on perceptions of the value of turtle in a functional, traditional, spiritual or other context that are significantly related to local cultural norms and society.

4.1.1 Value of Turtle in a Modern Context

Stakeholders' perception of sea turtle value is separated into two broad sub-categories. The first category is identified as the value of turtles in a modern context. This area of examination explored perceptions

of the value of turtles in a contemporary sense, including economic, nutritional, and other general values. The second broad category defined is that of the value of turtles in a cultural context, or those topics related to turtle in a functional, traditional, spiritual or other way that are significantly related to local cultural norms and society.

4.1.1.1 Economic Value of Turtle

Perceptions of the market value (or average perceived price in U.S. dollars) of sea turtles and sea turtle products were collected throughout the duration of the consultations. Many respondents also provided their perceptions of the market economy related to turtles. Most fishermen indicated that this market was increasing and that market activity motivated a significant part of their hunting and catch of turtle. In some, but not all, outlying villages turtles were harvested specifically for transport to Koror to meet market demand there. Some fishermen and stakeholder groups indicated that the price paid for turtle products conflicted with their own desire to reduce harvest pressure on turtle populations.

Some specific statements that describe these trends are as follows:

“The market value is the main driving force of turtle harvest. Fishermen do not necessarily harvest turtles for consumption purposes themselves; rather, they take turtles to make money. The sale of turtles is a very lucrative business for fishermen because the demand for turtles is always there. Turtles are sold at a rate of \$1.00 per pound unbutchered and \$1.25 per pound if butchered” (S2).

“One time, me and my brother made \$700 from two (2) melob we sold to Yano's market” (S2).

“[Harvesting turtles] is not a main source of income for me, it is just extra cash that I can make and use. The demand for turtles from

neighboring islands, specifically Koror, is the reason I hunt for turtles” (S2).

Others indicated that the harvest and sale of turtles was an economic development strategy within their state, citing sea turtles as the one resource that was relatively abundant on one of their islands.

In addition to individual private buyers who arrange purchases for personal or familial use, respondents often commented on the consistent demand for turtle provided by food markets and restaurants. Other fishermen provided insight into the influence of new markets developing within Palau, such as growing foreign labor ethnic groups who readily buy turtle products:

“Yano’s market is always buying turtles. This is because the demand is really high. Yano’s market complies with the open/closed season of turtles. It does not buy turtles during closed season” (S2).

“Like these Taiwanese, Chinese [buy] about this size, one hand carry, they can buy for \$80 [USD] or \$100...” (S11) the respondent indicating the size a small juvenile turtle with his hands.

Some respondents also offered their opinions concerning the growing commercialization of turtle in terms of sustainability and trade-offs with other purposes. These include the following:

“These days money has more value than keeping the animals around. This needs to be changed in order to conserve animals such as turtles” (G5).

“Commercial sale is not the best use of turtle, especially if we claim to use them for customary purposes... Now people look at [the] commercial dollar, that’s what drives so many people’s actions... the solution is in realizing this now, combined with our concern for tradition” (S4).

4.1.1.2 Health / Nutritional Value

Turtles are a nutritional food source for many Palauans, and certainly turtles are perceived as a valuable, nearly perfect food source due to their size and

nutritional characteristics. As one participant put it:

“Turtles are a huge package of protein...it is...an ideal food” (S17).

While the consumption of turtle protein can clearly contribute to health and nutrition, the percentage of turtle consumed relative to other foods was not identified within these consultations³.

However, many comments are indicative that turtle meat is not the primary source of protein in Palauan diets, and many suitable alternatives are available to fulfill nutritional requirements:

“If turtles ran out or we were forced to eat something else, I don’t think there would be a hardship. As long as we had fish... if we ran out of fish, then that would be a problem” (S23).

Regarding the cessation of turtle harvest:

“You would miss the taste of it, but it’s not going to hurt anyone...I don’t think it’s going to hurt any family in Palau because they don’t eat the turtle everyday; they just need fish all day. But the only thing you are going to miss is the taste and the looks of it in the pot” (G7).

“Nobody dies if you don’t serve it” (S16).

“Seems like...Palauans have reached the point in living (life-style, development stage) where people can eat other things besides turtle...they are not dependent on turtles like, perhaps, in the past. However, its use at certain events is important, because it is symbolic” (S4).

4.1.1.3 Value to Tourism

Other economic values perceived by groups and interviewees relate to the tourism market in Palau.

“Turtles have a lot of value for Palau, not just for customary purposes, but also for tourists to see. I think Palau has a lot to benefit from making sure that the turtles stay around” (S14).

4.1.2 The Value of Turtle in a Cultural Context

4.1.2.1 Socio-cultural Significance and Value (General)

Socio-cultural Significance

Turtle consumption in Palau carries with it many layers of significance, ranging from nutritional/dietary to symbolic. It is a valuable source of protein in their diet, one that is preferred for important events. It represents various dimensions of prestige and social status, to both those who consume it and those who procure it. Its use also represents a sense of cultural identity and an independence from outside food sources.

All stakeholder groups identified marine turtles as an important natural and cultural resource in Palau. When asked to complete the sentence “Turtle is...” respondents replied with answers equal to or similar to the following:

- Healthy
- Clean
- Protein-rich
- Tastes great
- Locally raised
- Cheap, inexpensive
- Feeds many
- Makes everybody so happy
- Is our food

Some in remote islands eat turtle because sometimes there is no other meat source. In those cases, individuals claim turtle as their food:

“Turtles are most importantly valued as a source of protein. It is also part of the cultural practice for Tobi islanders [to eat turtle]” (G6).

“In SW, turtle used to greet and host visitors” (G6).

“ People bring turtles to Customs.... it is pleasing to them. There is still a great social incentive to taking turtle” (S20).

4.1.2.2 Historical - Cultural Identity

Associations with animals can provide cultural references to the past and present. Symbols, stories, and legends of turtles are an important vehicle for these

associations. Elements of cultural identity can also be expressed through association with and use of particular animals.

Many legends and stories concerning aspects of sea turtles have always existed historically in Palau. Some of these are closely associated with Palauan identity and are represented with pride in contemporary society, e.g., the legend of the turtle and the two lovers at Ngemelis. In some instances, particularly in the case of Southwest Islanders, turtle was expressed as an important part of cultural identity that was specific to their society.

“Turtle is our food” (G6).

The use of *toluk* is often associated with women’s identity and worth.

“Toluk is our money” (Palauan woman).

4.1.2.3 Preferences for the Types or Characteristics of a Particular Turtle

Concerning cultural preferences for the types or characteristics of a particular turtle the following comments were offered by stakeholder groups:

“[M]ost people, Palauan[s], don’t like the small ones, they like the big one[s]” (S11).

“Large females taste best.”

“Male or female doesn’t matter, only the fat. As long as it’s big and fat” (S11).

“People buying turtles for markets do not have a preference for either female or male turtles. They will buy it regardless of its sex” (S2).

“Now some people prefer the smaller turtles because they taste better” (G5).

While describing types of turtles preferred for harvest, some general areas of consensus were clear; however, exceptions to the rule exist in almost every case. The results indicate that green turtles are preferred over hawksbill turtles for their meat. Larger green turtles are generally preferred because of higher fat content and the social significance attached to large catches. Hawksbill turtles are preferred for their

shell, and secondary importance is placed on their meat. Larger, older hawksbill adults are the preferred targets of harvesters due to the animals' larger, thicker scutes, which are converted into tortoise shell products. Adult female turtles of any species are said to be more preferable due to the perceived higher fat content and the possibility that they might be carrying (un-deposited) eggs.

Notable exceptions to these preferences included statements such as the following:

“Currently, there are people who like to eat small turtles because they are easier to cook and are much tastier than the large turtles” (G5).

Others preferred hunting smaller turtles in remote areas so that the meat would not go to waste. Still others mentioned that smaller turtles are easier to hide and to sell once boats return to Koror.

4.1.2.4 Related to Taste / Food Preference

The taste of turtle and its relation to food preferences can be an important consideration for conservation and management efforts.

The taste of turtle (especially green turtle) and turtle eggs was identified as an important factor related to its capture and consumption. In some cases turtle meat was described as too good and too tempting to resist. Many went as far as to describe the taste of turtle as “addictive.” Because of these preferences for turtle meat and its long-standing use by older people who were fixed in their ways, it was often suggested to focus conservation efforts in younger generations, who had not developed a strong preference for turtle meat. However, some opinions were offered that younger generations were already well accustomed to eating turtle meat and turtle eggs.

“Just this one experience caused her to develop the taste for turtle. ‘[The] problem,’ she said, ‘is that turtle taste[d] too good; that once you taste it once, you want to have it again’” (S23).

“...[T]aking the younger population of Palauans, I bet very few have tasted turtles and know what turtle meat is like. It is an acquired taste... as this young generation grows older, maybe the food aspect of [turtle] becomes unnecessary. Nonetheless...enjoyment and

taste of turtle and eggs is a cultural phenomena that you will have to take into consideration” (S16).

“...[T]he taste of turtle as a major challenge to its conservation... The only way of getting over this obstacle and improving the situation is to target the young who haven't developed the taste yet (S4).

“People here in Echang are used to eating turtle when they grow up, they know the taste, that's why they use it all the time” (S11).

“Upcoming generations' diet does not include turtles” (G2).

4.1.2.5 “Enabling” Qualities of Turtle

Turtle consumption in Palau carries with it many layers of significance that are related to various dimensions of prestige and social status. This applies to both of those who consume it as well as those who procure it. In additional, turtles serve special roles in many social functions.

“Turtle sharing invites reciprocation” (G6).

“It can be used as a food reserved for special people; this way one is not harming someone else if they don't receive some. It is also the type of food that you can share with absolutely everyone...not just ordinary people but all others. It is a chance to say ‘let me feed you,’ and play the role of provider. Not too many other foods allow one to play this role so elegantly. It can also, in the way it is distributed, be used to let someone know that they are on your *unliked* list. It allows one to practice their ‘dividing-up skills’” (S17).

“As I said for food and along with the idea of food is the concept of the ego, the prestige that comes with it as a man as a provider as a leader and so forth” (S16).

The hunting and capture of turtle is also a source of social cohesion through recreation as turtle hunting incites great interest and excitement throughout the community:

“If I may say so, [hunting] is a main factor for the decline of the turtle. No one can pass up a turtle if they go on a boat they see one surfacing. All else stops and they start chasing the turtle; no one just really looks away...if there are men on the boat. And as the story goes, we crave big turtle” (S16).

“When the season opens and the field trip goes down and comes back with ten or more than ten... [because] ...lots of people here want it” (S11).

4.1.2.6 Spiritual and/or Religious Significance of Turtle

Spiritual or religious connections to turtle are believed to play important roles in the use and function of turtles in Palau and the Southwest Island societies in the past. Related to spiritual use or practice is the observance of particular taboos or spiritual restrictions associated with turtles. These consultations were interested in learning if these or other practices were a significant part of the present use of turtles in contemporary society. Consultations did not identify strong existing or openly practiced spiritual or religious purposes of turtle. Certainly, any indication of religious or spiritual use was not prominent in individual or group responses.

One of the ceremonial practices attributed to the indigenous Modekngai religion involved the burning of turtle meat as an offering to their deity on special offering days, a practice that was indicated to occur in the 1950s (Tobin *et al.* 1961). The Modekngai religious group makes up roughly 11% of the 11,808 of Palauans who claim affiliation with a religious organization (1995 Palau Census Report, Table 10). The degree to which this practice is continued today is unknown. No information from inquires during the course of these consultations indicated the practice of this ritual; however, this does not mean that the practice of this particular ritual no longer occurs.

Comments from respondents on spiritual significance or uses of turtle include:

“There is supposedly a female god in Peleliu that has a certain turtle that wears a necklace around its neck. And...if you catch it...you try to keep it you can never get hold of it. You may catch it and bring it to shore, but then there

would be all kinds of things then you would delay the slaughtering of the turtle until the following day or the next, and when you wake up the following day the turtle is gone. And at times if you want to kill the turtle right away there will be all kinds of storms, wind/rain storms that would come. The turtle was kept as the pet (yes). They say it is very distinguishable because around its neck it looks like it has a string of Palauan bead money” (S8).

“I think that Kayangel sort of had, one family... that was saved by a turtle before, and they came to regard it as a spiritual, ah, deity, that they respected. They say that in the old, old days that they were forbidden to eat turtles. The eating of turtle just came very recently, like during the Japanese or earlier than the Japanese. Well they, ah, it was sort of like a spiritual rite in that one family, and then it spread out into the whole community of Kayangel and they were sort of forbidden to eat turtle until, I think, very recently, probably during the Spanish or German era, when a few people started eating it and now it is not observed any more in Kayangel” (S8).

Johannes (1986) mentions several taboos said to occur in the past, including a taboo related to turtles belonging to the god of the small island of Ngerur north of Babeldaob. Kramer (1929) in Johannes provides a description of the taboo on eating hawksbill turtle meat by all except elderly women. The extent to which these taboos are still practiced is unknown, however, no responses to inquires indicated that they taboos were practiced to any significant degree.

4.1.2.7 Ethno-medicinal Uses of Turtle

Consultations with particular stakeholder groups inquired about any medicinal purposes for which turtles may be used. Consultation among Palauan or Southwest Island groups did not indicate any apparent use of turtle for medicinal purposes. Tobin *et al.* (1961) indicates that turtle meat was sometimes used in treating illness through a ceremonial offering made by the sick individual's household. The degree to which this ritual is still practiced is unknown. Consultation among Southwest Islanders indicated that turtles are not used for medicinal purposes.

4.1.2.8 Required Use of Turtle in Customary Ceremonial Events or Practices

Ceremonial or other customary events and/or practices were defined in this review as events inherently and distinctly Palauan, but not directly related to spiritual or religious purposes. Respondents were asked to provide perspectives on the cultural use and value of turtles at these events.

Many respondents identified the role and value of turtles at specific ceremonial events and for customary practices.

“The only ceremony or custom...a turtle is required is when the Ibedul with his hat has to wash his hands in the turtle blood. The other custom is women’s money (*toluk*)” (S19).

“...[E]ach of these three kinds of sea creatures [the shark, stingray, and the turtle] are caught and distributed to all the *rubaks* of the particular area of the village., and [they go]...first to the first chief, and the other parts going to the third and fourth and the fifth one, on down the line. This is not only for the feasting or eating purposes. There is all the significance in there, just like the pig when it was killed and distributed to all the *rubaks*. The head has the eyes and the ears, and the mouth. The first chief should have all of [these] things. All the rest [of the chiefs], they have, the backbone the feet and so forth, to carry on the work of the rest... [I]t’s related to their position. The turtle is an animal of sort of a very mellow kind of sea creature. It is said that the reason that...the *melob* comes after, [and] that they eat [the turtle] and then the leaders realize what they are to the whole community. They are the leaders, but they have to put themselves down to the level of the rest of the community that they could understand the other side—they are not going to force themselves on the community. Every time any one of these four elders would be inducted to the *Klobak*, to the *bai*, it requires that they would go out and find a turtle and bring it, kill it, share it among the *rubaks*. For other community feasts, to my understanding, it was not a requirement. They would go out fishing...if they were able to get part of the fish, and they were [also] able to get a turtle that was all right, but not required” (S8).

“It’s like the shark the stingray and the turtle, they all eat it...and the significance of what the animal represents. They just call it different things. Like the shark is an aggressive animal, if a war comes around he is out there leading. Regarding the stingray, once a *rubak* is set on his position in the *abai*, he sits there and he doesn’t move and he doesn’t change his positions once the decision is made by the whole council of chiefs in that village. The turtle signifies that they have to be committed to the welfare of the whole community, that they have to think about the whole community, that they have to lower themselves into the seat or shoes of common people and see how they fit. So it’s just a symbolic thing... In Western Culture, when you say wash your hands of something it means that you get away from the whole thing. But here I think it has, turtle has, just the opposite meaning over here in Palau. When you’ve gotten your hands in there and you have eaten the turtle, you are committed; it is sort of a commitment to serving the public. If you became a *rubak*, and you ate this turtle and you dipped your fingers into it, you washed your hands in it, therefore you’re committed to your constituents in essence” (S8).

4.1.2.9 Significance of the Use of Turtle in Other Customary Events

In other cases of customary events or practices, such as *omersurch* or *ngaseche* birth ceremonies, *ocheraol* first-house ceremonies, and *kemeldiil* funeral services, respondents indicated that these were events for which turtles were important, but not a necessary element. Respondent often added that certainly turtles made the events nicer, but they were not required, *per se*:

“*Melob* turtles make a feast better, but are not required” (S19).

“Turtles are not required parts of custom. There is no custom that requires taking turtles—pigs yes, turtles no” (G4).

“Only recently turtles are harvested for customary purposes and also public functions such as inaugurations and state holidays. However, these functions need not have turtles” (S8).

“Turtles are not that important for any public function or other customary purposes. The turtle meats are just a compliment to the dishes prepared” (G5).

“There is no concrete/certain custom with turtles. In the past it was just used to show off that you caught a turtle and that turtles were plentiful, and also because pigs and other red meat were not readily available” (G5).

However, turtle enhances the prestige of a Custom:

“People will describe the event by the type and amount of food there. ‘Oh, they had three pigs, two turtles, and so many fish of this type...’ that it would be an important event. The turtles aren’t necessary, [they] just add to the prestige of an event.” “Turtle is important because it is rare, it’s often remembered [when it] is served or recognized” (S16).

“When we ask ‘what were the foods provided [at a customary event],’ we say ‘pig, a turtle.’ ‘How many turtles?’ ‘Two.’ ‘How many pigs?’ ‘Four.’ That adds to it” (S16).

4.1.2.10 Value of Toluk

Toluk and its exchange plays a very important role in the lives of Palauan women, as female participants in this review have pointed out: “*Chesiuch* is our money; *udoud era redil*” (G4). *Toluk* is valued according to characteristics such as size, thickness, shape and depth, color, design, natural pattern, and history:

“Women want more *toluk*, yet they keep what they have” (S19).

“And there is a way of valuing the *toluk*. The thickness of the *toluk* the way it’s...the art, the way it was made, the symmetry, the perfectness of the shape and when you put it to the light and you see the design. And the color, the deeper color is better than the lighter color, and also its age. Its age, but now each *toluk*, the big ones, have a history of transaction, this one was given to her to a person in this ceremonial function and then they gave it to...and there are various uses of *toluk*. *Ocheraol* which is the main, when

a person dies and they have children and the aunts and the sisters give an *Ocheraol* to the children, like a plate for food, that recognition is given to the size and so forth and that story, that history, goes with the *toluk* as it is transacted throughout its history. Most people nowadays, most *toluk* don’t have much of a distinction to tell it, the difference between this *toluk* and another *toluk*, so its more like now they are aiming like the numbers and the numbers gathered in one customary function and sizes, but not so much the history as before. And there are still people...I have a couple at home that are still precious because of the history of that... The craftsmanship is not as good as the ones we have, but they are just as valuable because of the age and the way it was made” (S16).

One woman explained that Palauan women often keep their *toluk*, because large *toluk* is exceedingly rare. Many women, then, opt to exchange smaller *toluk*:

“Some women would rather give \$1,000 than give up some of their best, most valuable *toluk*.” If you are very close in the family or clan, a women might give some of her best, but otherwise now we give less valuable pieces or money (cash in USD)” (S19).

These changing practices, and the reduced value of (new) *toluk* relative to work performed, are reflected in the following statement by one respondent:

“It was unheard that women, if they performed a service to their relatives, to their brothers, or to their husband’s relatives, if I give food and so forth,...to have two, three pieces of *toluk* given to you. Now, it’s possible” (S16).

“Also the numbers compensate for the size, maybe you get smaller pieces, but you get two of them” (S16).

4.2 COMMUNITY PERCEPTIONS OF TURTLE USE

One goal of the consultations conducted for purposes of this report was to determine community perceptions of contemporary sea turtle use in Palau. The concept of turtle use can refer to the amount, pur-

pose, or function of turtle utilization. Suffice it to mention here, that sea turtles are used for a variety of purposes and fulfill certain functions that are part of Palauan culture and contemporary society. Many of these functions and purposes have been covered to some extent in other publications (see Johannes 1986); and many have yet to be described adequately, due to the variability of changing trends and modes of use.

Stakeholders identified trends that seem to be influencing the degree of turtle use and/or how use is impacting turtle populations. Stakeholder groups described how they or others use turtles or turtle products of various species. Stakeholder groups were asked to discuss and comment on levels of use and harvest. While the information provided may be useful as a rough estimate of turtle harvest and use, it must be mentioned here that the results are in no way a substitute for a thorough quantitative assessment of turtle utilization. Such an assessment is beyond the means of this study and review of perceptions.

From a cursory point of view, turtles are used for food, for income, and for other purposes that are socially and culturally valued. None of these purposes are necessarily mutually exclusive. General comments that were compiled from group meetings and discussions, some of which provide particular insight in relation to management issues, include the following descriptions of sea turtle use:

“Turtle is our food” (SW Islander).

“We depend on turtle.... We’d rather depend on turtle than pig” (S6).

“We don’t eat turtle every day” (commonly expressed axiom).

“We only take what we need” (commonly expressed axiom in relation to turtle).

“If I have a money, I know some guys. Hey, I am going to tell my friends to catch a small turtle (and) we pay him one hundred dollars. We cook it, were not going to waste it, we’re going to eat all of it” (G7).

4.2.1 Turtle Use (General)

Turtles in Palau are used for food, for income, and for other purposes that are socially and culturally

valuable—with none of these purposes being necessarily mutually exclusive. It was identified that turtles were hunted opportunistically and more often than in the past, and were harvested by some regardless of season. Turtle use in some areas was perceived as high—high enough to cause the overharvest and continued decline of certain populations. General comments were compiled from group meetings and discussions, some of which provide particular insight in relation to management issues. Stakeholders described themes or trends that seem to be influencing or the degree of turtle use and/or how use is impacting turtle populations. Common statements related to general turtle use included the following:

“Turtle is our food.”

“We depend on turtle.”

“We’d rather depend on turtle than pig.”

“We don’t eat turtle every day.”

“We only take what we need.”

“We’re not going to waste it.”

4.2.2 Capture / Harvest / Use Rates

As noted above, this review and assessment of stakeholder group and individual perceptions was not designed for the rigorous quantification of the level of sea turtle use throughout the Republic. If managers desire such information, a different set of interview instruments and analytic tools will be required. However, the information provided by many respondents does provide grounds for general (anecdotal) estimations of turtle take and use. For example, concerning the perception of usage in the eastern Babeldaob village of Ngiwal, participants indicated various levels of harvest:

“About twenty (20) turtles are harvested a month during open season.”

“I individually harvest about two to three (2–3) turtles a month during open season.”

“...That in Ngiwal, if there are ten (10) fishermen taking each five (5) turtles a month that’s

fifty (50) turtles a month taken during open season. These are melob being taken.”

Regarding the particulars of take composition, compliance with regulations, purpose and motivations for harvest, and usage trends, these same respondents indicated that in Ngiwal:

“Some local residents of Ngiwal village do not follow the closed/open season in regards to turtle harvest. They harvest year round. During closed season, fishermen still harvest turtles.”

“I am aware of people from Koror and elsewhere requesting turtles from Ngiwal during closed seasons. These turtles are not only sold in Koror, but also given away to relatives.”

“More females are harvested than males.”

“We sell most of the turtles we catch to Koror.”

“The usage of turtles has increased over the past ten years.”

These comments can provide a general indication of the level of turtle harvest and usage. Discussing how often people in Ngerbeched consumed turtle, the Ngerbeched women’s group suggested:

“We don’t eat turtle all the time. For special occasions only; maybe twice in a year. But not here in Koror or Ngerbeched—we eat it in Kayangel. We didn’t go to get them, those in Kayangel brought it to us to feed us.”

Concerning the number of “serious” turtle hunters, who are known for their proficiency, knowledge, and high catch rates, it was indicated that:

“There are maybe fifty turtle hunters throughout all of Palau. Imagine that fifty, and maybe each one of them gets three a night or daytime; that is a lot of turtle. Even closed season and open season they still are harvesting” (S11).

It should be pointed out that harvest rates are not static but may fluctuate according to time and season, in addition to long-term changes. Harvest also affects different areas and life stages differently. Use patterns

in different areas are likely to be different:

“Ngaremlengui State harvests turtles more frequently, or more strongly, than others” (G5).

“Ninety percent (90%) of turtles harvested are consumed in the Ngaremlengui, ten percent (10%) go to Koror” (G5).

Concerning turtle harvest in the Southwest Palau Islands:

“During open season, about five to seven (5–7) turtles are harvested a month on Tobi” (G6).

“It has become normal that during open season about twenty (20) turtles per trip are brought to Koror from South West islands” (G6).

“Also harvesting of turtle eggs is very high on the islands” (G6).

“From 1984 to 1992, hundreds of hawksbills were killed at Helen Reef for the ‘economic development’ of one person, a state official. In eight years, they filled up twenty to forty (20–40) large cardboard boxes with only the four largest scutes of the hawksbill. These were brought to Koror and sold. The boys at the reef worked the scraps to make jewelry” (S11).

Regarding hawksbill turtle egg harvest in the Rock Islands, the following was offered:

“There is lots of digging of eggs in the Rock Islands” (S12).

“Take of eggs is increasing...because everyone is taking them, everyone has boats now” (G4).

These anecdotes point to a need for closer examination and methodical means of monitoring take and impact of harvesting practices on the local turtle populations.

4.2.3 Appropriateness of Level of Harvest for Sustainability

Given perceived levels of harvest and the current status of turtle stocks, stakeholder groups and inter-

viewees were asked about the appropriateness of the current level of harvest relative to the concept of sustainability of turtle populations. Stakeholder group responses varied widely, ranging from the opinion that current harvests do not affect turtle populations greatly, to clear acknowledgement that harvests in Palau were a major factor contributing to the apparent declines in populations. The majority of respondents, once they considered overall impacts and sea turtle biology, thoughtfully acknowledged that the levels of harvest were high given the current status and situation of turtles populations within the Republic and the region.

For example, a the conclusion of one stakeholder group consultation, it was perceived by most members of the group that:

“The commercialization of turtle shells is depleting *ngasech* numbers” (S2).

4.2.4 Trend in Commercial Sale and Exchange of Turtle Products

Throughout the period of consultations, individuals identified the growing sale of turtle products as a major factor influencing the capture and use of sea turtles in Palau. Many fishermen indicate that the commercial market is a driving influence relative to the number of turtles they harvest. Many of these same fishermen indicate that they would not normally fish for turtles due to their perceived decline in numbers and their concern for conservation, but that, however, the attractiveness to make easy money by supplying the commercial demand, largely overcame any of their reservations.

Others highlighted use of turtle products as an exchange items:

“The people either want the eggs to eat or use for exchange. They either sell them or exchange with others for something they want. I have seen young boys come into the village selling turtle or eggs for beer. This sort of practice is not customary” (S12).

In addition to historical forms of commercial use, new markets are developing with the influx of foreign residents. For example, it was noted be some that Chinese buyers in Koror regularly purchase smaller turtles.

4.2.5 Shipment and Trade in Turtles from the Southwest Islands

Judging by respondents’ comments, the common perception is that turtle stocks in the Southwest Palauan Islands are more plentiful and healthier than those in the main islands. There is a growing commercial trade in turtles from the Southwest Islands that are transported by ship to Koror.

“People request turtles from Southwest Islands because they are much bigger. Many people prefer the larger ones because they have more fat” (S2).

“I know that they are also beginning to sell them. I know that when the field trip goes and comes back, there is something like twenty to thirty (20–30 [turtles]) at one time. I know the Southwest Islanders, the people that live in Echang, are hungry for the turtle. They have been staying here in Koror and it is not that accessible. Once or twice a month if they get turtle, they are really happy” (G7).

4.2.6 Commercialization of Turtle Shell Products

In the search for larger hawksbill scutes, it was often mentioned that Palauan women are searching further a field and outside Palau to acquire these more valuable pieces of tortoise shell. Examples related to the importance and increasing demand for raw turtle shell (tortoise shell) from hawksbill sea turtle:

“Everyone in Koror is after hawksbill shell. Before each trip, usually ten or more people are asking for *ngasech*, and offering cash for turtle shell brought back from the Southwest (Islands)” (G6).

Smaller hawksbill turtles and remnants from larger animals’ shells are utilized for jewelry making. Those with knowledge of retail markets generally agreed that the scale of tortoise shell jewelry had increased over the last ten years.

“They use smaller turtles to make the jewelry” (G4).

“People hunt them to make *toluk*, then go door

to door to try to sell them” (G9).

4.2.7 Need for the Creation of New Toluk

Regarding the use of sea turtles and sea turtle products, it was asked of many groups if it was necessary for new *toluk* to be continually made. Most groups and individuals indicated that trends in the circulation of *toluk* have changed over the years so that more *toluk* (of lesser quality and value) is continually being made and exchanged among women for customary purposes.

Regarding the economy of the exchange of *toluk* pieces, another informant provided the following insights and opinions:

“The thing about *toluk* is that it is always made, never destroyed. It is very valuable. So people in Palau have been making *toluk* since the old days and it’s been accumulating over the years. There is an amount always in circulation, but it is always getting more. In the old custom, *toluk* would come in and go out of your possession as need be. Now, in these days, *toluk* comes in, but money (cash) goes out...women are hiding (hording) their pieces of *toluk* and they always want to get more. Cash money is replacing some aspects of the exchange of *toluk*. It is easy to get U.S. money, hard to get good *toluk*. The new *toluk* being made is smaller, thinner, lighter, so it is of less quality. That’s because the turtle they need to make the big valuable *toluk* from are not plentiful as they use to be, they have been harvested. In my opinion, the women don’t always need to make new *toluk*; there is plenty existing now. They can just use what they all ready have. ...I am sure that will change things a bit for them because they won’t want to give up their valuable pieces, but they can adjust” (S3).

Women interviewees and stakeholder groups generally expressed a like opinion that if the production of new *toluk* would cease, it would take some time for the customary exchange system to adjust accordingly, but that it would be a good adaptation overall, keeping in perspective concerns for the preservation of indigenous hawksbill turtle populations.

“But there is enough because they are exchanged so they go around and around” (G4).

“Value will increase with stopping of production” (G4).

“On the other side, when we do ban really anything that has to do with taking turtles the *toluk* value that is in circulation comes up and that’s a point that we have to stress to women especially, that whatever small piece you have is going to be precious five years down the road and any new infusion will be like fake money is going on around here” (S16).

4.2.8 Sale of Turtle Shell to Tourists

Women’s groups and female interviewees were asked about their perceptions and opinions of the sale of turtle shell products to tourists. The women’s group consulted in Ngerbeched indicated that they do not agree with the sale of turtle shell product to foreigners:

“We really don’t like (the commercial sale of tortoise shell), but there is no law to protect us” (G4).

Regarding the sale of *toluk* and/or *toluk* replicas in stores, women leaders suggested that the sale of replicas of *toluk* should be stopped because it “ruins the value of the *toluk*”. They suggested further that the sale of turtle shell products was a poor use of shell—especially since increasing volumes of shell is beginning to be acquired from smaller turtles.

“I think that was the main reasons for decline in hawksbill turtle is because [fishermen] were choosing any thing and they were [satisfying] the tourist trade, tourist market, and gifts... government officials were giving them away” (S16).

Women indicated that it would be better to let those same turtles grow to adult sizes so that larger, thicker scutes could be more readily available. Additionally, it was specified that these turtles would be large enough to reproduce to generate more offspring.

4.2.9 General Attitudes Towards Turtle Harvest

General attitudes towards turtle harvest and conservation were often uncovered during consultations.

Many respondents pointed to the multitude of different rationalizations people can take to justify their actions, highlighting difficulties with enforcement and community sentiments.

“For some fishermen, it’s like instinct to eat these foods; they see the turtle then want to catch it. They might know the law is important, but for that moment, it’s OK because it is only one person doing it. They see the turtle and then think about how good it tastes. With the stocks of turtle now depleting, it’s like the money is running out in the bank” (S18).

“For those that aren’t aware of biology don’t believe there is a decline, they think ‘it’s OK, there are lots of turtles’” (S4).

“For those who see or are aware of decline and biology, they say ‘it’s OK, I am only taking one, or I am only taking what I need.’ When you don’t see the change, it’s hard to understand the need...cutting back or conservation is just not relevant” (S4).

4.2.10 From Traditional to Modern: Changing Values and Changing Use

Many respondents offered their opinions about the changing practices and values associated with turtle use. Concerns were often raised about the changing behavior associated with state parties or ‘Customs’ for which more turtles are being served. Many identified the loss of traditional authority in regulating turtle harvest and consumption. Still others mentioned that turtles have lost some degree of their special significance because they are harvested more often. Respondents attributed many contemporary use patterns related to turtle harvest to greed and individualism, including a loss of ethic of conservation and respect for other generations to come.

“You know they used to be strict. If they were having a party, a state party, or a custom, you only go out and get one or two, that’s it. Now, they don’t use those customs now, whatever they want they go in and get” (G7).

“In the past, turtle was a special thing. It was not harvested everyday, like today” (S8).

“I feel that these customs have dwindled down...with the exception of feasting on turtles...on important occasions. But nowadays... if they can get them on a daily basis, they eat them on a daily basis. It’s something that I just feel, well, I don’t like it because I feel that the folks that do that are very greedy. In their way of doing things, they don’t think about people or the next generation, just becoming sort of non-Palauan in essence” (S8).

“In old days chiefs were the only ones that could eat turtle or be able to distribute it. Even the fisherman that caught it could only get a small portion of the meat. But since they have been Christianized and since the human population declined, the chiefs now let everyone eat turtle” (G1).

“There is a fundamental change in the value of turtles from a traditional to commercial use... [It] is an issue of the right to use becoming a right to sell” (S17).

“[With] traditional conservation methods... the chief would direct turtle harvest that that he would determine the distribution, but now it is not like that. Traditional systems...have dissolved” (S23).

4.3 PERCEPTIONS ON SEA TURTLE RESOURCE STATUS

4.3.1 Status of Sea Turtle Resources (General)

Overall, there is a widespread consensus of opinion among individuals and groups that overall population levels and sizes of common sea turtle species in Palau, both hawksbill and green turtles, are low and have been declining for years. This perception is consistent with the general concerns of various individuals, organizations, and agencies throughout Palau over the past decades regarding the decline and possible extirpation (local extinction) of sea turtle populations nesting in Palau.

The three primary factors contributing to turtle resource status listed above, density (abundance), average size, and nesting frequency are addressed in more detail for both green and hawksbill turtles below.

4.3.2 Trends in Population Density (Abundance)

All stakeholder groups generally agreed that turtles in the water and turtles nesting were observed less. Preliminary interviews supported this position, as well as the majority of the focus interviews. Statements of agreement that resulted from community meetings and interviews on the topic of abundance include the following:

“Most regular fishermen know the decline, they have seen it over the years” (S12).

“There is a problem with turtle decline” (G1).

“Turtle’s numbers are drastically declining and will keep on declining. Compared to say fifteen (15) years ago, the numbers are drastically lower” (S2).

When initially asked, groups would refer to both common species, hawksbill and green, as in a state of decline. When possible respondents were asked to distinguish between their perception of the hawksbill and green turtle density; it was commonly considered that this species in particular had decreased drastically, specially the number of adults within populations, although as mentioned below, one could still find small individuals near the reef.

“That one [hawksbill turtle] especially has gone down in number and size. It’s hard to see big ones in the water” (S3).

Similarly, respondents suggested that the sightings of green turtles is also declining:

“On the other side of Ngerchong, they use to just chase the turtles over there. Early morning there used to be so many *melob*...whole bunches of them; but now, no more” (G7).

“Helen Reef is now not like it was in the ‘70s, when the turtles would school there like they were fish” (G6).

Respondents often related to trends in turtle abundance by referring to the diminishing number of turtles observed during a boat ride or fishing:

“I believe turtles are endangered...absolutely. In the ‘70s out by the KB Bridge where I used to travel a lot, you would see three or four turtles going out to fish and three or four turtles coming in from fishing...now it’s one or none the whole time” (S12).

Additional indicators that support the condition of decline are related to the time required or the distance traveled in capturing turtles. Fishermen reported that it takes longer to find the preferred sized turtle than in the past, and that some fishermen are traveling to other states’ waters to hunt turtles because of depletion in their own fishing grounds:

“Turtle populations are declining drastically. Before my father and I used to pass up turtles in search of the better size we wanted. Nowadays, you can’t pass up even small turtles because you might not see one again” (S2).

“Growing problem now is that turtle fishermen are going from outside their places to other areas to find turtles...going from one state to another to get marine resources” (S18).

4.3.3 Trends in Average Size of Individual Turtles

Throughout the consultations in this study, it was uniformly agreed that the average size of turtles has declined in Palau over recent decades. These findings were supported by great number of responses, such as the following:

“Turtle sizes are getting smaller” (G5).

“I see a lot of *ngasech*, but they are really small and they are not worth anything. I do not harvest them because they are useless because of their size” (S2).

“I am worried about the decreasing size. As a small boy I can see really big turtles. I used to see turtles that took four (4) men to carry, really. Now what they call four (4) person turtles (*obateuang*) are really two (2) person turtles (*obaterung*) of the old days in my youth. The young guys don’t know what they are looking at⁴. The turtle population can take a long time

to change, but it is much less, with average size going down. Twice in my life I have seen a turtle that took six (6) people to carry (*obatolelem*), they had to use a pole and six men to move it. You don't see those any more" (S3).

Not only is this a concern of respondents because many of the targeted animals are no longer readily available for harvest, but another concern of others was that if fewer adult turtles remain, there will be fewer turtles left to breed and reproduce in the future.

4.3.4 Trends in Level of Nesting

Throughout the consultations, there was a general consensus that the number of sea turtle nestings has declined over the years. Concerning the level of Hawksbill nesting in Palau, representative comments include the following:

"You don't find nests in the Rock Islands like you used to" (S3).

"[Hawksbill nesting is] way down, way down, the numbers are way down. See, I am one of those people in Peleliu that goes around the Rock Islands most of the time taking turtles that lay eggs in the sand. I won't hide anything...before you could go like in Ngemilis you find two turtles a night coming up to lay eggs...two or three. Right now you can hardly find anything coming out" (unidentified fisherman).

Regarding apparent nesting decrease of green turtles on Merir Island, the following was offered:

"The family living on Merir Island has recognized the numbers have been declining over the years. In talking to the old man on the island, I have learned in the '70s there used to be hundreds of (green) turtle nesting at night...now there are only say fifty or fewer, sometimes even none. But still they keep taking turtles, now more than ever with the large boats going back and forth from the islands to Koror. We don't need a scientist to tell us that the numbers have gone down" (G1).

4.3.5 Trends in *Toluk* Size

A supporting comment to the above areas of consensus is the growing observation among Palauan women that the average size of recently fabricated Palauan women's turtle shell money is becoming smaller⁵. Community consultation revealed individuals perceive that large pieces of turtle shell scutes are becoming scarce and difficult to obtain from fishermen, indicating a condition of resource depletion of large, highly-valued size classes:

"Newly made *toluk* getting smaller" (G4).

"Turtles now days are so small that *toluk* being made are smaller as a result" (G5).

"Now small or average size *toluk* are not valuable as before because there are [relatively] more of these sizes of *toluk*" (G5).

"I have seen one *toluk* that is more than a foot long. That thing could have been longer than that, because when you shape it, it sort of shrinks. But it was a big *toluk*. Today, maybe the biggest (new) ones I have seen are like six inches, eight inches long. So I think it is diminishing in sizes as well as number" (S8).

The perception of diminishing *toluk* size is nearly uniform among Palauan women. In addition, this concern is often a topic of discussion among Palau women's groups and has been raised by women at recent women's conferences. It is suggested that large pieces of *toluk* can be obtained occasionally, but average size of pieces have been decreasing for many years. The decrease in size of raw hawksbill shell (and the continued demand for large pieces) has caused some to search for larger tortoise shell scutes in locations outside of the main islands, including in the Palau Southwest Islands, Yap, Philippines, and Indonesia.

4.3.6 Other Status Issues

Other status issues include any other topics or commentary that may provide indication of the status of sea turtle populations in Palau.

One notable one that was mentioned relates to disease conditions affecting populations' status, noticed especially with respect to green turtle populations.

One stakeholder group (Sonsorol) indicated that they had been seeing green turtles with cancers and or tumors. This condition may be related to turtle fibropapilloma disease.

4.4 EFFECTIVENESS OF CURRENT REGULATIONS/POLICY (AND RELATED COMPLIANCE AND ENFORCEMENT ISSUES)

4.4.1 Perception of Effectiveness of Current Regulations (General)

Effectiveness of Current Regulations refers to the performance of modern laws related to sea turtle management. The poor effectiveness of current turtle regulations (including enforcement) was a common theme during community consultations and interviews. Many expressed their notions of consistent violation of existing regulations, and of the lack of disincentives associated with them. Some respondents commented existing laws were good, but that they needed better enforcement. Others saw the need to revise the regulations to include more efficient protection and stricter limits on direct take of sea turtles.

In some cases, many expressed the opinion that the regulations are considered only one form of governance, one that is often disregarded when forms of customary practice, tenure, regulation, or privilege are invoked.

4.4.2 Knowledge of Existence of Turtle Regulations or Turtle Status

Nearly all of the individuals consulted expressed knowledge of the existence of laws or regulations specifically related to limitations on the taking of sea turtles in the Republic (24 PNCA 1201). Most were not aware of the Palau Endangered Species Act, although most participants were familiar with U.S. efforts to control turtle use in Palau through the U.S. Endangered Species Act during the Trust Territory period. Many respondents recognized or reported the knowledge of association of sea turtle species with the classification “endangered” in other parts of the world.

When asked if Palauans in general are familiar with the term “endangered”, one respondent replied:

“No, but they may understand it if explained to them...they have seen the effects and may understand it better” (S12).

4.4.3 Knowledge of Details of National Turtle Regulations

Many groups and individuals consulted during this study, while aware of the existing turtle regulations (Ref. 24 PNCA 1201), were unclear about the specifics of the regulations. In many cases, groups requested assistance in recalling the specifics of the regulations. In some instances, some expressed erroneous knowledge of the current laws, citing the belief of supposed illegal activities not known to be illegal within the current legal framework. Specifically, there appears to be confusion regarding, 1) the opening and closing of seasons for taking turtles; 2) the size of legally caught turtles; and 3) the exportation of sea turtle products from Palau.

4.4.4 Effectiveness of the Limitations on the Take of Turtle (as Written)

The effectiveness of laws can be related to the appropriateness of the substantive content of the laws and regulations themselves, in addition to factors, such as the way in which they are enforced. This subsection addresses the appropriateness of the regulations, as written, in achieving the regulations’ assumed goals. This section addresses perceptions of the biological soundness of existing regulations. This is related to the approach through which the regulations attempt to meet their objective⁶. The approach is essentially a year-round ban on certain lifestages (nesting females, eggs, younger turtles under specified sizes), and no-take restrictions on all turtles five (5) months out of the year. In this way, this section does not address how the regulations are applied or enforced; that issue is left for remaining sections below.

There were varying opinions of the substantive content of the regulations as they relate to the law’s effectiveness. Some individuals in groups commented on the soundness of the existing regulations, expressing a perception of the existing regulations (or components of the existing regulations) as useful and/or effective:

“We have good laws, just need for better enforcement” (G1).

“Rules are good, but people are taking the small size. Existing rules are OK, but enforcement needs more effort, improvement. Once rules

are enforced people learn the rules, then they take the right size” (S3).

Recognizing the biology of these animals in group discussions, the importance of restricting take of nesting turtles and turtle eggs was often acknowledged, and how this particular restriction was beneficial to the maintenance of sea turtle populations. However, it was also mentioned (in group after group) how difficult it has been to change or regulate the behavior of citizens through the way in which existing regulations are currently configured and/or are implemented.

Some states have implemented their own regulations, some focused on species level protection pertaining to increased regulation within protected areas. Examples of these state-level regulations include the full protection of hawksbills within Hatohobei State’s jurisdiction, and limitations on take within Kayangel’s Ngeruangel Marine Reserve. While the constitutionality, application, and consistent enforcement of these state-based regulations remain questionable in some cases, most agreed that these additional levels of regulation were beneficial for specific stocks of concern.

An opposing view to the abovementioned sentiments was the opinion that deficiencies in the current regulations and management regime are significant and need to be addressed. Mention of these deficiencies within consultative groups was mostly related to observations that sea turtle populations have continued in recent decades despite the existing regulations. While poor enforcement was cited as a general factor in the ineffectiveness of the limitations on turtles, some mentioned deficiencies in the regulations themselves in maintaining turtle populations. These include observations that the existing regulations allow for unlimited harvest during the open season. An example of this reasoning is provided in the following statement:

“I think the closed/open season in the existing law does not do any good to maintain/protect turtles. It does not work well given the slow maturity rate of these animals. For instance, one or even two years of no harvest does very little (with respect to) the natural birth cycle of these animals” (S2).

Respondents who shared this opinion felt that the regulations, even though they were designed to control harvest for a part of the year, were not effective in

controlling overall harvest to be able to maintain stable or robust turtle populations.

One respondent, who lived on a remote island, mentioned that the existing regulations were inefficient due to the fact that restricting harvest to larger turtles promoted waste in many cases:

“The law encourages taking of large turtle, thus for small families consuming such turtles, most of it goes to waste because there is no way to preserve the meat” (G6).

Others contemplated the nature of the size restrictions from a biological perspective:

“When you look at the science, there is probably room for revision. The hawksbill turtle, one cannot harvest below twenty seven inches (27”)...but how many years does it take to breed and how many times will it have the opportunity to breed? Maybe we should get rid of the size classification” (S4).

Other deficiencies in the existing regulations were identified by stakeholder groups. Many of these problem areas relate to the scale of contemporary activities and issues not addressed in the current “Limitations”, which were developed originally in the 1950s. Many groups referred to the growing commercial trade in sea turtles and their products as a motivating factor, especially with respect to the commercial sale of both green and hawksbill turtles. Examples of comments referring to the suggestion that existing regulations were not sufficient because they did not adequately deal with emerging trends in legally sanctioned exploitation included the following:

“The main reason I hunt turtles is because people in Koror ask me and they are able to pay for them” (S2).

“The sale of turtle shell jewelry in stores and shops is increasing” (G4).

“Many people in Koror request and buy turtles from fishermen who bring from the Southwest” (G6).

Throughout the group meetings and interviews, there emerged an apparent concern by many that the

existing regulations, and the manner in which they have been approached and enforced within the last decades, was inadequate to reverse the apparent decline in sea turtle populations within the Republic. This sentiment was manifested clearly in most meetings (after information was discussed within groups); however it was at the resource managers' meeting that this concern manifested itself most markedly:

“Regulating size and season the way it is currently has been is not enough to sustain and recover turtle populations.”

Discussion with the managers group suggested that deficiencies in the approach of the existent management regime, taking in to account centralized national level sanctions and the resources allocated to its enforcement, has not been sufficient to regulate the use and protection of Palau's sea turtle populations.

Another related area of deficiencies identified in the existing regulations is the existence of various loopholes within the current regulatory approach. These loopholes were related to illegal activities that were difficult to discern and regulate through existing regulations. Most of these respondents acknowledged the ability to sell or possess turtle products throughout the year as a deficiency in current regulations. These individuals believed that without a clear way to certify the origin or legality of products, enforcement would continue to be a problem. Cases in which these loopholes exist are presented below in the following comments:

“Some are selling green turtles to the markets in Koror. Others who hunt turtle use the excuse that they have kept that turtle in the freezer and it was caught during the open season to get around the existing law” (G5).

“Right now people can say, ‘we took the turtle during open season’ as an excuse for illegally taking turtle for the purposes for making new *toluk* or using frozen turtle meat during the closed seasons” (G4).

“Sometimes people use the excuse when they take eggs from the sand that the eggs were in a turtle that they caught and there is nothing that could be done about it” (S12).

“To get around the regulations, people during the open season are now beginning to catch and butcher smaller turtles in their boats and discarding the shell in the water so that the size can not be determined by law enforcement officers. They call these ‘chicken’ turtles because the size of the bones and meat are like chicken parts” (G8).

4.4.5 Compliance with Regulations

In early interviews, the topic of Compliance with Regulations was regarded as important because it was felt strongly contributes to the overall effectiveness of the current regulatory framework for managing turtles within the Republic. Compliance is distinguished here from enforcement in that it describes the degree of conformity, cooperation and obedience of citizens with regulations or laws; whereas, enforcement is considered as efforts intended to induce compliance with regulations or laws. Compliance in this sense was described to participants as the degree to which turtle rules, codes, laws, edicts, and/or regulations were followed and adhered to. Compliance can be regarded as influenced by components of 1) awareness and public support of existing regulations, and 2) the effectiveness of enforcement as a deterrence for prohibited activities.

Clearly and almost uniformly with regards to existing turtle regulations, it was found in these consultations that the perception of compliance with existing turtle regulations in Palau is low.

As mentioned above, not all respondents expressed clear knowledge of the specifics of the existing limitations, which could confound assessment of the degree of compliance. It was unusual that a respondent or group would indicate that compliance was high, although many expressed the desire to follow existing laws. Others provided examples of how fishermen would follow existing regulations. However, in most other instances, numerous examples and generalities were offered to explain how sea turtles were regularly targeted and taken opportunistically by a significant portion of the Palauan fishing community, regardless of season, size, or activity (*i.e.*, during nesting). It was also mentioned that live or freshly butchered turtles, on occasion, are presented as food at ceremonial and special occasions outside of the legal harvest season. The taking of turtle eggs from nesting beaches was also a common area of chronic non-compliance

offered by many groups and individuals. Examples of comments provided on general levels of compliance include the following:

“Fishermen still take turtles during closed season” (S2).

“Even out of season, people go out to the reef and harvest turtles. They come back with the turtle like there is no problem with their actions” (S23).

“The harvesting of turtle eggs is very high on the islands” (G6).

4.4.6 Violation of Rules by Those with Authority or Status

An important dimension of the topic of compliance that surfaced during many discussion groups and interviews concerned the issue of those with authority or high status (whether fishermen or government officials) violating or encouraging the violation of turtle regulations. It was regularly suggested and openly offered that, “People with authority break the rules.” An example of this activity is described in the following quotation:

“Even some of the high-ranking people here in Palau government, like the delegates, the national delegate, senate, they really like turtles. They can buy one of the big ones for like \$300. ...*during season and not season, year round*” (S11).

This sentiment often related to turtles taken out of season for special or customary events associated with prominent individuals, extending to birthdays, personal celebrations, and government inaugurations. While those with authority may not have directly violated national code themselves, it was recognized by many that these individuals are often linked to the purveying of illicitly-caught wildlife (either directly or indirectly, through requests, encouragement, or by condoning violations of the law) for special events. Condoning or preventing proper enforcement action of illegal activity was also mentioned as a major problem in the area of compliance. As it was explained by one respondent:

“They want to impress, they put on a feast, and they go and they said ‘we did not catch this turtle there, we caught it in the jurisdiction of this state and according to our rules and procedures, according to our constitution we control this area and we decide what to do with this area’...such an explanation is ridiculous and [is] just an excuse when it is obviously a violation of the law” (S16).

An associated aspect of these violations was the degree to which they made compliance lower and enforcement more difficult. Intentional non-compliance of national turtle laws by those with high status or authority was identified as an important management issue not only due to the fact that the actions are illegal, but also because these actions are usually prominent events in which the offenders (or supporters) set examples of behavior for the rest of Palauan society. This type of behavior, some respondents expressed, made it appear that either the violators were “above the law” or that the existing regulations are not that important for people to follow (since others can freely violate them without fear of prosecution). While it was recognized by many that this issue was related to conflicts between modern and traditional values, it was still stressed that this behavior (and selective enforcement of national laws) undermines the effectiveness of the existing regulations and should not be tolerated.

“What really upsets me and many others, is when people of high position break the season laws; like with the President during his daughter’s wedding. He asked for turtle to be there and it was closed season. He brought in plenty of turtle and nobody did anything. He is not above the law. Even (name withheld) was there and he ate the turtle, he did not do anything. This is really unfair for the people of Palau... and does not set a good example. If the leaders follow the rules, the people will respect the rules—if they are fair and they understand, they will follow the laws.... It will be difficult to get compliance otherwise” (S3).

Speaking of procuring turtle (even during closed season) for official government visits to the State, those directly involved in the hunting and preparation in a Babeldaob State said:

“It has now become normal that we do these things” (Ngeremenglui Fishermen).

4.4.7 Compliance with National Regulations in Relation to Remote Areas

Upon discussion, it appeared that many consulted felt national regulations do not apply in remote areas as strictly as they do in more central locations. It was presented by a few respondents that compliance, adherence, applicability and acceptance of the existing national turtle regulations is less in outlying areas. These participants indicated that this perception is based on an understanding among local residents and government officials alike that allowed those living in remote locations be less compliant with national regulations. This understanding, it was explained, had to do with the difficulty in finding food and the unavailability of certain types of protein at certain times in remote locations. The effect that this understanding may have on the effectiveness of existing regulations is unclear. However, some involved in group discussions recognized that the lack of governance in remote locations—influenced by a pervasive attitude that “those rules do not apply here” and combined with other factors such as increasing access and an increasing commercial market for sea turtle products—posed significant threats to sea turtle populations occurring in those areas.

An indication that adherence and compliance to national regulations is less developed in more remote areas is suggested in the following statement to national government officials offered during recent preparations for a outer-island field trip:

“I know you are law makers, but please forgive us if we serve you turtle during the closed season. It is the only meat we have on the island” (unidentified).

“But those guys out there they depend on it in times when it gets rough and they can’t go outside to do any fishing. That’s understandable” (S8).

4.4.8 Degree of Enforcement of Regulations

While many identified developing voluntary compliance through broad-based support, awareness, and understanding of turtle biology and regulations as

important, enforcement was regarded by many as a necessary and crucial prerequisite for effective marine turtle management:

“Enforcement is lacking” (G2).

“Also the regulations are not enforced...in the SW or Palau” (G6).

“There is no law enforcement” (G5).

“The \$100 fine, if you are unlucky to get caught, is much too low [to deter people’s behavior]” (G2).

“Weak enforcement is encouraging the harvest of turtles. People are not afraid of the law” (S2).

The lack of enforcement (and lack of sufficiently stringent enforcement examples) was frequently mentioned as a primary factor contributing to the poor state of compliance and sea turtle management in Palau. Enforcement was viewed as ineffective and insufficient by an overwhelming majority of the respondents. It was a common opinion that, despite the existing regulations and some diligent enforcement efforts, illicit turtle harvest continues at a high level.

Difficulties in enforcement implementation were expressed in terms of too many cultural, geographic, financial, regulatory, and political factors. For example, speaking on the problems of enforcement of sea turtle regulations, one respondent commented the following:

“What enforcement? Enforcement is not really a determinant in people’s behavior towards turtles—except they might hide their catch a bit more when it is out of season or [the turtle caught is] undersized. Enforcement has its difficulties because of the cultural connections to turtle...and with our culture and customs, it is very easy to use these customs as an excuse for our behavior, or not to take any action” (S4).

4.4.9 Degree of Enforcement Capacity

Expanding on some of the factors that influence enforcement mentioned above, the degree of enforcement capacity was identified as a specific problem area. Stakeholder groups generally concluded that

enforcement within the existing management regime (including local, village/state level customary practices or regulations) does not occur on the scale or are not implemented to the degree that is necessary to deter and prevent violations. This sentiment was linked to the vast and varied geographic area and features (e.g., nesting beaches, coastal waters, restaurants, markets, residences) that would require enforcement efforts. Some explained that there were not enough resources allocated to national agencies to carry out the surveillance or enforcement activities required for the regulations. Related to this sentiment, it was often suggested in consultations that there were not enough national or state level conservation officers to enforce regulations effectively, and that neither were court cases being effectively pursued by national prosecutors.

4.4.10 Enforceability of Regulations

Enforceability of the existing regulations was not rated high due mostly to loopholes and other difficulties with enforcement. Most commonly offered reasons for deficiencies in enforcement were: large and diverse coverage areas; multiple points of capture, transport, and use; inability to identify nesting turtles once captured; a lack of financial resources; limited enforcement personnel; unwillingness to prosecute high profile cases; and cultural considerations that hinder enforcement. These limitations and deficiencies were exemplified in many situations shared over the course of this review, for example:

“In Palau, hawksbill turtles can be hunted during the closed season with a low risk of being caught and the shell made into *toluk* or jewelry for legal sale anytime of the year. This fact deludes the capacity of the laws to regulate hawksbill take by seasonal measures because markets are always available to fishers” (Manager).

Enforceability was linked in discussions to 1) the configuration of the regulations themselves (e.g., regulations that target certain prohibitions that are difficult to enforce) and 2) the entire regulatory framework that currently exists in Palau (e.g., particular incongruences with national/state/traditional relationships). See Graham (1998).

In addition to the lack of capacity of enforcement within the existing regulatory framework, other

comments pointed to deficiencies in the regulatory framework itself.

“There may not be enough funding for conservation enforcement and there are needs for more officers; but the problem is larger [than] these constraints alone” (G8).

The missing ingredients for better management, it was suggested, were associated with changes in the regulatory system itself (including modifications to the regulations on turtle harvest), and increased awareness of and support from the Palauan population. Trying to raise the level of (national) enforcement to the level of effective and sufficient compliance within the existing system may cost too much and have negative social implications, such as poor public acceptance. The suggestion to open up thinking to more decentralized or co-management approaches (for the species in question) suggests some believe that the capacity to enforce turtle conservation regulations within the current regulatory framework is potentially less than in other management frameworks.

In addition, developing voluntary compliance through broad-based support, awareness, and understanding of turtle biology and regulations was mentioned as an important strategy.

4.4.11 Degree of Social Difficulties with Enforcement

Enforcement difficulties due to social factors were an important challenge to effective enforcement of turtle regulations. One of the most common problems mentioned were those encountered when close acquaintances or relatives were involved. While most officers undoubtedly do their best to apply uniform standards to the enforcement of the law, such principles can be difficult to follow. Factors such as status and position often affect enforcement of rules in all societies. In small island settings, social implications of enforcement activities are intensified due to relatively close familial and other social relations. In the words of one respondent who mentioned the difficulty of enforcement of sea turtle laws and marine laws in general:

“If the person is related, you let them go. Otherwise, it would be like cutting off your own arm” (fisherman).

It was also noted, however rarely, that enforcement officers themselves sometimes violated turtle regulations, that they were corruptible or ineffectual (relative to power imbalances with those with status) in enforcing rules with which they were entrusted. This topic was mentioned relative to some of the newly established and existing conservation areas that have hired conservation officers. It is believed that some of the conservation officers were associated with violations of existing regulations, especially in cases when higher government official in their jurisdiction control the officers.

Another important area of consensus was the difficulty in attempting to enforce existing regulations when individuals of high status or authority are involved. Often in these situations enforcement was discouraged, not allowed to happen, ignored, or their formal cases are not prosecuted by the national government. A couple of comments related to this topic were:

“There is an inability to restrain elected officials or people with high authority for arranging the procurement of endangered species, who do not actually fish for the animals, but do ask for them” (G8).

“The wealthier, richer families get away with violating the law but those from poor families are often prosecuted” (G5).

4.4.12 Other Inadequacies with the Regulations

In discussions with individuals and stakeholder groups, other inadequacies within the existing regulations were noted. Most prevalent of these were related to the failure of the existing regulations to address the effective protection and maintenance of quality habitat required for sea turtle populations to survive. Other comments related to the fact that sea turtles are highly migratory animals, and therefore conservation efforts have to include the various nations and states that share sea turtle resources. The following comments express this concern regarding negative impacts to nesting beaches from lighting sources and modification of nesting habitat in the Rock Islands:

“There are observations of turtle hatchlings crossing in the streets in Melekeok [because of

disturbance from lights]” (S18).

“[The nesting turtles] are all gone ‘cause you’ve cleared [the beaches].... There used to be many good nesting places (in the Rock Islands); look at now, they clean them. You’re not supposed to clean that up like a playground. No turtle is going to come up” (G7).

These and other concerns reflect stakeholder awareness of additional elements of sea turtle management and conservation that were not included in the existing turtle regulations and which influence the regulations’ effectiveness. It is unrealistic to believe that the original regulations—written in the 1950s prior to the development of significant knowledge in the field of sea turtle biology—simple in scope, would be comprehensive in a contemporary sense.

4.5 VIEWS ON PROPOSED MANAGEMENT ALTERNATIVES

When consulted, individuals provide their opinions regarding management options that had been discussed or presented during meetings and/or interviews.

4.5.1 Change / Update Law

Modifying the current regulatory framework was a prominent theme among respondents regarding potentially effective means to alter turtle consumption patterns. Many in personal interviews acknowledged that many would be reluctant to give up customary fishing practices but would agree to stricter management regulations to recover populations if they were properly enforced. Specific responses to modification topics follow:

“Lastly everyone seems to agree that regulating size and season the way it currently has been is not enough” (G8).

“All the men wanted to see turtle numbers increased and suggested that there should be a stronger law” (G5).

“Law should be changed to correspond to new information about the turtles” (S19).

“However, we should only eat turtle if we must, and in very limited quantities, because it is connected to our way of life...and we want to be able to keep doing this. The remaining question is: if we have to have turtle...what should we take? What kind? How many? Perhaps we can ask the scientists this” (S4).

“But we must put the law first, and update the old T.T. laws so that we can be more effective” (S18).

“People just take chances with the law; they know better, they just feel like they can get away with it. I think arrangements like what they did in Ngeruangel is what we need. However, I think we must be very concerned with how a traditional law and western law might go together or conflict. This is very important” (S18).

4.5.2 No Take - Moratoriums

Opinions varied somewhat on developing a moratorium on turtles and how to initiate such a plan. Some suggested that there should be a complete ban on taking turtles, while others felt that making exceptions for special occasions and cultural observances would be more acceptable than a complete ban:

“If we want to increase numbers, we should just close it. It is necessary to prohibit harvest indefinitely, together with stronger enforcement for numbers to increase. ...[I] would support such action to ban harvest until such time the number of turtles has recovered to a sustainable level” (S2).

“We will support a close for taking turtles, that way it’s easy when you see people taking turtles you know it’s illegal. Right now people can say, ‘we took them during open season’ as an excuse (for *toluk* or even frozen meat)” (G4).

“We should close...maybe if we close for twenty (20) years, there will be a lot of nesting turtles again” (G4).

“Perhaps a two to three year moratorium on *ngasech* would be practical for a law because

many locals have difficulty in seeing the long-term goal of such a law. A five to ten year law may be to extreme but rather to have two to three year ban and while have extensive monitoring of turtle during that time and just keep renewing the moratorium” (S19).

“I think we should have no take, no harvest for anything, and not for recreational fishermen. We need to encourage more responsible behavior of all. The real fishermen know the problem, they have seen the decline with their own eyes” (S12).

“We cannot totally stop harvesting of turtle. This is because turtles’ use and consumption is totally embedded in Palauan tradition and custom. We have to be realistic in how we can manage these important resources” (G2).

4.5.3 Change Size Limit

Regarding modifications in the size limits there were many suggestions and no consensus. Some suggested increasing the minimum size of turtles to allow for better breeding conditions for female sea turtles:

“We should make the rule to increase the maximum size from twenty five to thirty inches (25–30”) for the hawksbill. I feel the sizes being taken are too small to allow for enough breeding. Turtles should be allowed to breed more” (S12).

Others suggested reversing the size regulations to protect larger individuals.

“Perhaps taking of smaller turtles (ones that are not ready to nest) seems more plausible, this letting the bigger more mature ones to nest and produce more young” (G2).

“It makes sense; but it’s not good...if you bring a small turtle to a custom. The value is too small...the eating is not tasty like the big ones” (S3).

4.5.4 Change, Reduce or Eliminate Season

When contemplating changes to the harvest sea-

sons, most groups indicated modifying the season to shorten the open season. None specified biologically-related seasons which they thought were preferable, although some suggested that studies be done to determine if there is a better season than others to protect turtles.

“We should study turtle nesting seasons and change the law to reflect their biology” (S2).

4.5.5 Restrict by Method of Harvest and/or Quota

Because some forms of hunting turtles are too effective, some suggested imposing a ban on certain methods of harvesting. Others suggested alternative (traditional) methods and imposed quotas.

“Ban spearfishing of sea turtles as a harvesting method” (G6).

“...[T]here should be a limit to the number of turtles harvested and the method of hunting [*i.e.*, to limit spear throws]” (S19).

4.5.6 Restrict Use for Specific Purposes

Some thought it would be good to allow for certain specified events, but close the season for regular harvest.

“It’s a good idea to only harvest turtles for certain occasions, but prohibit harvest during the whole year. For instance, harvest one or two for special public functions, such as inaugurations” (S2).

4.5.7 Addressing Commercial Sale

As discussed earlier, there is growing incentive to harvest turtles for the market economy, placing greater pressure on local turtle populations and contributing to their decline:

“For a buyer in Koror if you inform him he will buy it that day or send someone to get it. Thus, it’s important to have tougher laws against buying of turtles” (G5).

“Why should we be selling turtle shell when we

don’t even have enough for us. The *toluk* should be used the way Palauan women use it” (S19).

“Selling turtle commercially is not as important as tradition” (S19).

“There should be law that would penalize people that buy turtles [in particular Koror]” (G5).

“He believes that if you want to stop harvest of turtles then you must stop the sales and commercialization of turtles” (S2).

“Ban sales of sea turtles. Many Palauans in Koror request and buy turtles from fishermen who bring them from Southwest Islands” (G6).

“I think the primary emphasis, if I may say so, should be on *toluk*. The decorative part, decorative uses of turtle shell is really the modern, ornamental things we see. And that could go as far as I am concerned we could forgo that. For the tourists, there are other types of things that you could substitute for that” (S16).

“Tourists should be discouraged from buying...because tourists fuel the demand for more take of turtles. The more tourists buy, the more production of turtle shell jewelries, the more harvest, the less *toluk*” (S12).

“The craftsman can work from other materials, like seashells or coconut shell.... Anyway the *Ngasech* turtles are more important to us as a society than their jobs; they can do other things” (S4).

4.5.8 Allow / Follow Customary Harvest and/or Traditions

Many respondents supported the customary use of turtles, but there was a range of opinions about how to define tradition and how to regulate this type of use:

“We need stronger regulation[s]. We need rules that allow for only customary use, not for private or commercial use. We should only use turtle when there is a real custom event, when we need them for a ceremony. Then the people in charge could say how many we need, and

then the fishermen go out and get them. To me, that is more like the traditional way of doing things, and would help us control harvest” (S12).

“Like in Kayangel, they follow regulations of how customarily they should harvest, and I think it is working out pretty well for them, enforcement-wise” (S12).

“Perhaps we can develop other strategies that build on old ways but are more enforceable” (S23).

Other suggestions for regulating customary harvest included comments similar to the following:

“A complete closure with the exception when it comes to customs or requests from Chiefs...in which case it should be necessary to get permission from the Council of Chiefs” (G5).

“That is something we could probably look into, OK? Maybe harvest only male, certain age male; try to leave the female. I really think it would be best to do away with (the current regulations) and try to replace it with something that would say ‘OK, we can harvest only eight turtles during the month of August to December or whatever. And when there are cultural occasions that we have to do, then harvest only ten, five, six, whatever number, however many you might need for that particular occasion and that’s it. And only male.’ Because definitely you can tell the male from the female when they’re grown up. I feel it is the chief of each and every village that should control those things. But of course right now they’re sort of they don’t really carry that much clout in the community anymore, their respective community. So, perhaps another avenue is to approach the council of chiefs and ask for their assistance and their blessing for some of these programs, but not only turtles, but other marine resources that are declining. Because if we just say the legislature would create laws, with their laws over there, but do you know how many conservation officers there are? There is like three or four to cover all of Palau. That is an impossibility. [It seems like it works much better] at the village level, where you give the authority to the village

elders to oversee that...I think that is the most effective way. Give it to the Governors Office to decide, in cooperation with the chiefs of the villages and the communities. That might work a lot better than at the national level. At least that’s how I feel” (S8).

“But, I really think we must work first with the modern law system, because that is the constitution we adopted as a nation; and then make local, customary arrangements as appropriate. If traditional conservation can work by itself, I will quit my job and give all the conservation division money to the hospital or some place more useful. However, if they call a special occasion of ceremony where they go out and break their own rules or get too many turtles than is sustainable, then I won’t agree with that. It is very disappointing and disturbing” (S18).

4.5.9 Prohibit the Making of New *Toluk* and Other Hawksbill Use

“For *Ngasech* numbers to increase, we must stop making of *toluk* and other turtle shell jewelry products [bracelets, ear rings, etc.]” (S2).

“We should just close, we have enough *toluk* to exchange” (G4).

“We should close the season for that one (*ngasech*) for ten, twenty, even thirty years until the situation improves. The women use that one for money. They are too low. But perhaps they could get the shell for their money from somewhere else, from some other place” (S3).

“The reason why Palauan (bead) money is so precious is that it was frozen some years back and so the small pieces and few pieces that went around gained value and significance. Maybe we should do the same thing with *toluk*; but another thing I think also you should have some aspect of this to regulate those who make *toluk*, who they are and where they get their material, it’s kind of a business thing, especially the jail. They’re some of the main ones” (S16).

“And, if there is an attachment with education and awareness, it’s the shell part of it that is

going to be forever important, because we know the women. We set the trends, we compete and that's what my concern is more than hunting for food" (S16).

"There has to be a widespread effort, Palau has to do its part, but there are other countries like the U.S. and other CITES countries that could help. Perhaps what we need is a moratorium on the making of new *toluk*. There is already enough in circulation. Maybe we should wait ten (10) years and see what happens. Maybe the turtles will come back by then or perhaps the women can learn to live (adjust to living) without new *toluk* being made all the time. Perhaps the pieces they have now will become more valuable" (S18).

"Tourist should be discouraged from buying... because tourists fuel the demand for more take of turtles. The more tourist buy, the more production of turtle shell jewelries, the more harvest, the less *toluk*" (S12).

"The craftsman can work from other materials, like seashells or coconut shell... Anyway the *Ngasech* turtles are more important to us as a society than their jobs; they can do other things" (S4).

"We have seen this and I think people think: 'what can I do about it?' It's the fishermen who catch turtles and the women that want *toluk*; unless we can get to both, we they, and our efforts, will be countering one another" (S4).

4.5.10 Addressing Government Related Activities

Some pointed out difficulties with government (national and state) involvement with sea turtle harvesting, whether subsidizing turtle transport through national-funded vessels (such as the Patrol Boat and state operated vessels), or providing turtle at government sponsored feasts.

4.5.11 Curtailing Turtle Transport from Southwest Islands

Many respondents suggested curtailing the harvest

of turtles in the Southwest Islands as a key way to stem the circulation of turtle in Palau:

"Turtles caught in that area are to be left there" (G6).

"Prohibit export of turtles from the Southwest Islands" (G6).

"Southwest Islanders should bring back turtles only for food, and not for market or exchange; that is the way I feel. When they bring only two (2) back, that is plenty for them. When they bring more than two, then that is for market" (S12).

4.5.12 Improving Enforcement through More Officers and State Programs

There was a clear and strong consensus to strengthen the enforcement of any legislation, new or existing, regarding sea turtle harvesting and use—especially through the development of state law enforcement divisions. Some recognized the need for national government coordination and oversight, especially in situations in which social implications in states make enforcement difficult. The following statements reflect these opinions:

"Each state should have a good marine program like Koror State's program. Other states should have this so they can coordinate together and better enforce these laws" (S19).

"Also suggested that each state should have local marine law enforcement to oversee everyday fishing operations. In Babeldaob there is a great need for state rangers" (G5).

"To improve enforcement officers, he thinks we need more marine enforcement officers. Believes that if every state could have a marine enforcement officer, there would be more compliance with the existing law" (S2).

"And more and more workers for the conservation, and every state should have an office in it, as a branch of the national government for each state" (G7).

“Expert fishermen should be made conservation officers” (G5).

“The state government does [play] a role because they are closer to the people, but by the same token I am hesitant to give...the entire authority to the state government because they know each other, they are family, they’re relatives; so it is very easy to turn the other way, when you see some infraction of the rules, so in that regard yes and no. But, this enforcement should be separate from every else and staffed with people who are knowledgeable in the field and have authority and power to do what the law says they should do” (S16).

“Participants mentioned the need to for the Minister to designate parties within the states (state enforcement personnel) to assist with enforcement of national conservation (or/and any other). These state personnel can/also have experience/authority with enforcing state laws. These individuals can [be] authorized to make arrest through an MOU with the states or through a designation available in some laws” (G8).

“KSG needs assistance from [the] Minister of Justice to enforce national law. An established authority given by national government to the state governments would help to enforce the turtle laws, because according to the current system, state government cannot enforce national law, only national government can enforce national law” (G8).

“It’s too costly and expensive for each state and the national government to have such Marine Enforcement such as Koror State [has], look for possible mechanism to lessen the expenditures, and still be able to give citations” (G8).

“Although this is good idea, a big concern is that these state law enforcement personnel would also be under the Governor of the State, which can be corrupt, (a couple of Governors are known underhandedly to be violators of turtle regulations and other laws). This can be a problem in the future, if this authority is given” (S18).

“If the State law enforcement are given authority by the national government they will have more confidence to not hide violators and be able to enforce law to full extent. Also this will set a precedent for other state enforcement to follow” (S14).

4.5.13 Increase Sanctions: Fines and Imprisonment

Many feel that currently there are not enough disincentives to encourage people to comply with turtle harvesting restrictions. A common suggestion was to increase the level of fines and/or to implement stricter jail terms for those who violate turtle regulations. On the need for more stringent penalties for those who violate sanctions, some groups and individuals suggested the following:

“Penalties should be more strict” (G5).

“Fines for the existing law should be increased and should include jail terms” (S2).

“Agrees that the increase of fine along with imprisonment for offenders will definitely increase compliance in his opinion” (S2).

“[I]f you don’t pay that fine you get jail time of about three months. I think the law in Palau should do that. You should get at least \$1,000 fine and you got a six months [term] in jail if they find you guilty” (G7).

“[If they] catch somebody that broke the law, they should have to pay \$1,000 and three months in jail. Hey, no one wants to go in jail for three months just to catch a turtle. That’s what I like” (G7).

“We should fine each offender perhaps up to \$2,500 for each violation...” (S18).

“I see the main flaw for any laws that have been put out—and that is including drug laws and prostitution laws all those laws that are for socially unacceptable behaviors—is enforcement. There are laws, there’s just no enforcement. And I think like the gun control law, once you put someone in jail, for twenty five years,

that's it; you learn the lesson" (S16).

"[B]ut the main thing is that I would be worried about the government trying to be too restrictive and the people resenting this...(that's why we have to start with the children). Thus, we need voluntary compliance and understanding in the place of heavy-handed government enforcement...." (S4).

4.5.14 Prevent Abuses of Power

Preventing abuses of power and authority was seen as one of the most effective and influential ways of improving enforcement and management. Suggestions generally involved more self-policing and checks-and-balances within the regulatory framework.

"But that is more like the turtle problem, it involves relatives, it involves friends, [it] involves politicians a whole segment of different facet of the population; it's hard, but once someone is put in jail for that...we will begin to listen a little bit, and the thing about the, and I think also, the state leadership should police itself; there should be traditional law prohibiting any use, consumption or whatever of turtles. If there is a family that, if you hear that a family went to sea and got a turtle [illegally], impose a fine on them" (S16).

"I just see potential problems where those in power are actually involved in illicit activities themselves...such as certain governors on the western side of Babeldaob taking turtle out of season for what they consider special occasions. There should be some kind of checks on state level activities. That is what happens in a state [that] is OK, as long as it is no worse than National Code...." (S18).

4.5.15 Protect Critical Habitat - Nesting Areas

The need for maintaining healthy critical habitats and protected areas for turtles was recognized and suggested during many stakeholder meetings:

"You don't clean the beach[...], just let it the way it is" (G7).

"Provide more nesting beaches under the law [protected areas]. This will provide areas for turtles to nest with no human disturbance" (S2).

"Nesting areas of the hawksbills need protection for their critical habitat for Palauan women and their money" (S14).

"Protect areas where nesting is high" (G2).

"Fence nesting areas to protect eggs from natural predators" (G2).

4.5.16 Promote Conservation Action

On forms of conservation action, one respondent suggested:

"One good thing for people to do would be to destroy the footprints of the turtle, that would help the nests survive. That should be a job of Koror State and the dive operators" (S12).

4.5.17 Improve Turtle Education and Awareness

Perceptions on needs for education and awareness were provided from statements such as the following:

"The general people know about the problems with turtles in general; they have heard of the decline globally; but when it comes down to local level, they don't sense that [the populations] are in decline" (S4).

"Education is the key factor that will help to save the turtle population in Palau" (G2).

"Educate children about turtle biology and law managing turtle populations. Children will help to protect turtles by policing their families, relatives, and the community" (G5).

"If people know about the biology, that turtles take a very long time before they are able to give birth, they will help to protect these rare species" (G2).

"An educational campaign to better manage turtles should start from the top down, meaning that higher officials should show more

responsibility in protecting these important animals” (G2).

“Policymakers, especially, should be fed with this important information. They are responsible for making the laws, they should be aware. Also the information should be shared to all levels from the leaders all the way to the children” (G2).

“Education is critical for saving these animals from becoming extinct in Palau. People should become aware of the turtle biology and behavior...should conduct meetings at the state level with small groups to share this information regarding turtles” (G2).

Need to visit all “*beluu*” and discuss with people who are “*chad era uel*” (G4).

“In order for sea turtle numbers to increase, people must comply with the current laws in existence” (S2).

“One can say we have been doing these things since time immemorial, and that it will be hard for us to change; however, we can accept new ideas and information, and give them to schools and younger generation to give a consistent education/awareness program over a number of years with someone constantly minding the program. I like this project; and I support it. I believe it real important to give a presentation to the next women’s conference and to Bilung. The women should take a lead in this because it is an issue so important to them” (S16).

“One of the most important things is the scientific information that you can give to people, including the women, so they can understand more about these things” (S16).

“We need to encourage respect for endangered species” (S12).

“Education was good at one time, there were TV/video shows on turtles, art contests, and school education as part of the *Year of the Sea Turtle*...but a lot of that has stopped. We need

kids continuing to learn and tell us about turtles in science fair and science clubs all the time; it shouldn’t stop” (S14).

“I think we have to be critical and strategic about how this conservation/policy project deals with people...it has to send the right message...you have to think of your audience” (S4).

“We need some approach that will break the complacent attitude with turtles...we need to feel like there is something that can be done... How can one (one of the public) be against a policy maker (a leader), if our leaders are the ones to make and clearly explain the reasons for these rules? Education is critically important (just as important as enforcement). It’s not hard to change behavior when you internalize the issue at hand as *your value*” (S4).

“I think it is good for communities to have meetings to discuss the problems and become more aware of the situation” (S18).

“It is all in the understanding that people have...the understanding gained through education. That is, “give people the idea, then they conserve”... But, we also have to work with enforcement, like what they have done with rabbit fish. The harvests of rabbit fish are much better now that the restrictions are in place. We should do the same thing with turtle. The rules are there, but we need education and enforcement. The more people understand, the more support you have, then the more effective the rules are” (S3).

“Additionally, we should be more innovative than we have [been] in the past with education... One of the things we could do is trying the concept of food exchanges like they have for people with diabetes...we could exchange turtle for some other protein. The fact is we don’t need to eat turtle anymore...nor have we ever, it has always been a delicacy. We want to decrease the demand” (S4).

“It is no one else’s Palau. This is our Palau. Let’s try to do something to save it. If it is not us, no one else is going to do it for us. If we are going

to deplete the resources we have in the marine environment, we are going to do without (turtle) in the long run. We are going to have everything gone. So we all depend on this one thing. So we should conserve it, try to get what we can get and still go back the next day and get some more, and following day and get some more. We get the small ones, and the females being taken, where will we be five years down the road? I think that a lot of education has to be done to make people aware of this fact. And probably do some education programs on the radio, TV, whatever we have around. Let the people know that we need these resources. Not only the turtles, but the clams, the lobsters, *et cetera*” (S8).

“I think we can sort of incorporate maybe a radio or TV program and getting an elder involved in there. To say some of these things out to the public...just mention some things” (S8).

The importance of educating the youth was clearly emphasized by many:

“You know is very hard now for a hard-headed individual like I am and individuals who are older than I am and others who are a little bit younger than I am to get it through our thick skulls that these are important things. We have to minimize the harvest of certain species in order to be able to give us something in the later days, even our children when they grow up” (S8).

“I am sure we can probably do a little bit of something and tack it to the science or social science program or whatever is fitting and get the young ones now that are in school to get aware of this kind of thing so that when they grow up they have this thing instilled in them. I have a grandchild that is six years old, and if that guy grows up through elementary school with this kind of thing I am sure that this guys would have this mentality. And I feel that just to do it right now, to say that we can switch everybody’s mind into the other, it’s very hard” (S8).

“If you instill it in their minds now when they

are still young, when they grow to be in their teens, they will be a few among themselves who would be aware of such things, and these numbers could grow in numbers as the years go by” (S8).

“I feel that we have to start it early and I feel that it is time right now to get it into the curriculum of the schools, to be taught as part of the science curriculum or whatever, to be able to understand the way nature works” (S8).

4.5.18 Emphasize Leadership, Planning and Coordination

On the topic of the need for leadership, coordination and planning, the following comments were offered by both groups and individuals:

“It is possible to work together when people are really motivated to do so” (S20).

“[We] need to find those social sparkplugs, the right channels that help to get things done. Those that are flexible and facilitate and create solutions to obstacles” (S20).

“[A]void a million stand-alone ideas...if it’s there, it should be integrated. Have a workshop to develop strategy” (S20).

“Oh yes, oh yes, I think women’s conferences and women’s organizations should be the ones that take the lead in this preservation program, especially if they are going to insist that we should stop. It would then be of one mind, then I think it is possible, to say no, because our money would be gone and there would be no source for this, and well will continue to see *toluk* getting smaller and smaller and to a little replica of it or we just see pictures of it. So I think. Like the women’s conference we talked about, and I think...we need the begin somewhere. We have forum for it, we have a women’s conference, we have women’s clubs, I think women should take the (lead) their interest is at stake. No body dies if you don’t serve it” (S16).

“A conservation plan should be developed” (G2).

“Good leadership is necessary because people really don’t work together” (S20).

“[T]hat building a proposal a good idea as the next step after the community meetings. That way, the managers would know more about what people want to do and how all the different sectors could work together for a more comprehensive program” (G8).

4.5.19 Encourage National and International Cooperation

National cooperation relates to national and state interaction. By international cooperation what is meant is participation in international and/or regional programs aimed at enhancing the management of shared sea turtle resources across international boundaries. Many suggested the need to coordinate national and state management and conservation activities so that programs are more comprehensive, have greater reach, do not undermine each other, and are generally more effective. Some suggested the need for wider international coordination and participation between Palau and other resource-sharing countries.

“[T]he continuing decline of turtle population...is a worldwide problem that should be part of a United Nations project” (G1).

4.5.20 Information and Monitoring

Views on information and monitoring needs were provided from statements such as the following:

¹ All consultation responses are coded for anonymity (S_ = Interviewee; G_ = Group). See Appendix 5 for a list of group meeting participants and interviewees.

² It should be noted that comments or statements provided within this appendix have been selected for descriptive purposes and are not intended to be representative of all opinions or perceptions encountered during the consultative process.

³ A difference in relative consumption of turtle products is expected to vary by location, culture, income,

“We had been collecting information on the nesting turtles (when and where) for sometime, but it was only of interest to the State, so I stopped recording. It didn’t seem like that information was useful” (S14).

“It is important to know and disseminate the following information: what we do have, what is being taken, and what it’s affecting” (S20).

“Because the legend says that they nest every two weeks, people think that they are constantly nesting” (G4).

“We need to survey which parts in Palau have turtles. And how many turtles there are” (S6).

“We should look at our harvest more carefully” (G1).

“I am interested in a project that monitors turtles, as long as it does not drain my resources too much and as long as we have guidance to let us know that we are doing some thing useful and meaningful” (S14).

“Yes, we could do more. We monitor Jellyfish Lake and for a while we did monitoring of grouper at Ulong channel. We have patrols out in the Rock Islands all the time, enforcing laws and picking up trash. But we would need training and jobs for locals. But it would be useful to become part of a global support program so that we could all know more about the Rock Island hawksbill turtles” (S14).

and other factors, as has been identified in previous reviews. For example, it is expected that people living in remote areas will consume a greater percentage of turtle in their diet. Additionally, it is expected that individuals from lower income households consume a greater percentage of turtle as well as higher income families with greater disposable income for purchasing turtle.

⁴ This and other recorded information concerning perceptions and observations relative to density or

status of turtles (or any other resource) may very well be affected by “shifting baseline syndrome” (Pauly 1995; Sheppard 1995), which relates to the age and relative experience of the informant.

⁵ Women’s turtle shell money, or *toluk*, is made from one of the four large scutes from the carapace of the hawksbill turtle. The use of *toluk* is a traditional use of sea turtle that still has great importance within contemporary Palauan society, although its use and func-

tion has adapted with changing times. Large *toluk* plates tend to be valued more than smaller ones.

⁶ A test of this aspect of the regulations’ effectiveness would be to ask: “Is it reasonable to believe that if the regulations were 100% enforced and complied to, would the current regulations be effective in maintaining sustainable populations of sea turtles in Palau?”