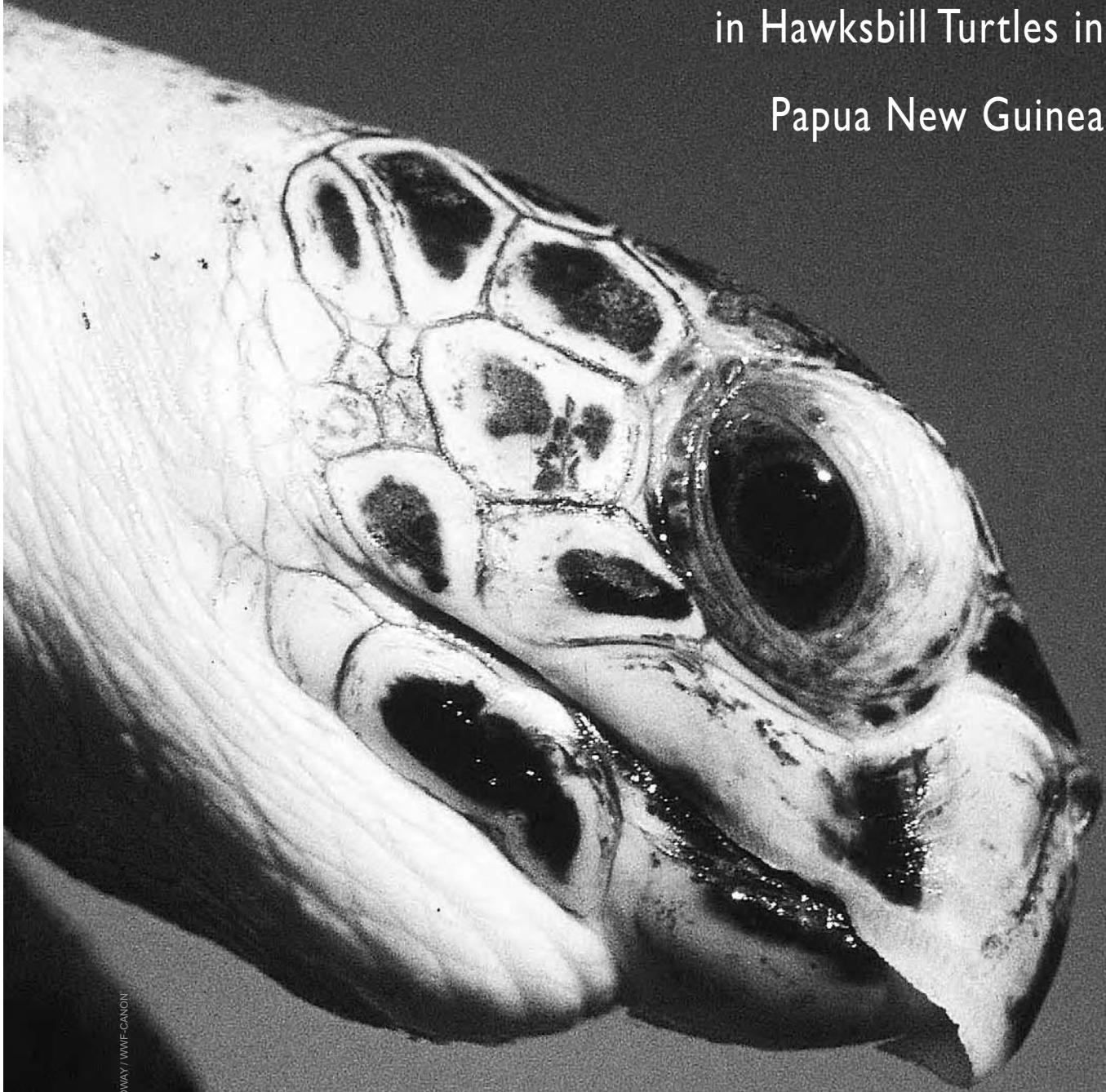


An Assessment of the Trade  
in Hawksbill Turtles in  
Papua New Guinea



HAWKSBILL TURTLE *ERETMOCHELYS IMBRICATA* CAT HOLLOWAY / WWF-CANON

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**T**he trade in Hawksbill Turtles *Eretmochelys imbricata*, medium-sized cheloniids with a pan-tropical distribution, has been recognized as a key threat to their conservation in the wild, and has greatly contributed to the species being listed as Critically Endangered in the IUCN Red List (Milliken and Tokunaga, 1987; Groombridge and Luxmoore, 1989; Meylan and Donnelly, 1999; van Dijk and Shepherd, 2004; TRAFFIC Southeast Asia-Indochina, 2004; Bräutigam and Eckert, 2006; Mortimer and Donnelly, 2007; IUCN, 2009). Sought after for its thick keratinous shell plates (often referred to as *bekko* or tortoiseshell), eggs, and sometimes meat, unsustainable harvest levels have endangered the Hawksbill Turtle throughout its distribution. Declines in populations in the Pacific have been widely reported (Hirth, 1971; Witzell and Banner, 1980; Pritchard, 1982; Balazs, 1983; Witzell, 1983; Johannes, 1986; Groombridge and Luxmoore, 1989; Miller, 1994; NMFS and USFWS, 1998; Meylan and Donnelly, 1999; Mortimer and Donnelly, 2007). Hawksbill Turtles and their eggs are widely used in Papua New Guinea for a variety of purposes, including subsistence, sale, barter (Spring, 1980, 1981, 1982a,b,c; Pernetta and Hill, 1981; Wright and Richards, 1983; Kinch, 1999, 2002, 2003a; Koczberski et al., 2006) and for celebrations at Christmas and the end of the school year, which coincide with the peak turtle nesting period in the austral summer months (Kwan, 1994; Kinch, 1999, 2002, 2003a). In many areas of Papua New Guinea, Hawksbill Turtles are also opportunistically taken as 'by-catch' by fishers out on the reefs targeting lobsters, shellfish and sea cucumbers (Kinch, 1999; Kinch et al., 2007).

## BACKGROUND

Tortoiseshell has long been used by the coastal and island villagers in Papua New Guinea for a variety of utilitarian, decorative and ceremonial purposes (Table 1). However, Pritchard (1979) and Spring (1981) reported that the use of tortoiseshell and Hawksbill Turtle carapaces in ceremonies has generally been abandoned. In the Trobriand Islands in Milne Bay Province, young girls have their ears pierced as babies and tortoiseshell earrings are inserted and continue to be added as the girl grows, resulting in large extended ear-lobes (J. Kinch, pers. obs.). Tortoiseshell lime sticks or spatulas (usually an ornately carved piece of scute) are used to transfer lime powder (made from coral, freshwater or marine shells) to the mouth when chewing the mildly narcotic betel nut *Areca catechu* (Boucher and Mannan, 2002; Strickland, 2002), and are popular amongst men in the Milne Bay Province (Kinch, 1999, 2001).

### Historical trade in tortoiseshell

A market for tortoiseshell derived from the carapace and marginal scutes of Hawksbill Turtles has existed for centuries. Tortoiseshell became a valuable trade commodity between indigenous inhabitants and European traders, consequently playing a significant role in

changing the cultural and economic fabric of coastal and island inhabitants in the Pacific. For example, during the expedition of *HMS Rattlesnake* in 1848, Huxley (1936) recorded that people brought yams, coconuts and tortoiseshell to his vessel anchored at Piron Island, Milne Bay Province, to trade for iron. During the later British and Australian colonial era, foreign traders regularly hired villagers to harvest Hawksbill Turtles on nesting islands within their waters in order to supply the lucrative tortoiseshell trade (Kinch, 1999, 2002, 2003a).

Eley (1988) reported that the Kiwai peoples of the Western Province, which borders the Australian islands of the Torres Strait, did not have a history of working or trading tortoiseshell, unlike their kin across the border in the Torres Strait (Limpus and Parmenter, 1986, 1988). However, Kiwai men who were employed in the Torres Strait crayfish fishery did learn to carve tortoiseshell, and upon returning to their home villages, began harvesting Hawksbill Turtles to obtain tortoiseshell. Kiwai tortoiseshell products or the scutes were then traded or sold to Torres Strait Islanders (either as a business transaction or through traditional trade or kin relationships), who sold the items to companies in Cairns, who in turn sold them on the local market or shipped them to Japan. Eley (1988) also reported unsuccessful attempts by Kiwai villagers to ranch juvenile Hawksbill Turtles to grow out for later culling, by tethering juvenile Hawksbill Turtles that had been caught on the reefs to stakes on the mudflat adjoining the village.

In other parts of Papua New Guinea, Pritchard (1979) and Spring (1981) note that scutes were often kept by coastal and island villagers for sale to Japanese and European traders but that this trade had declined significantly in more remote regional areas and villages when Papua New Guinea became a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1976. However, despite being a party to CITES, the trade continued around the capital, Port Moresby (Pritchard, 1979; Hirth and Rohovit, 1992).

### Previous market surveys

During the 1970s and 1980s, several market surveys were conducted in Papua New Guinea to determine the levels of trade in Hawksbill Turtles. Between February 1979 and December 1981, daily surveys at Koki Market in Port Moresby recorded a total of 154 Hawksbill Turtles for sale (unpublished data, cited in Meylan and Donnelly, 1999). Hirth and Rohovit (1992) monitored several markets, hotels and supermarkets in Port Moresby for tortoiseshell products over 36 days from February 1989 to January 1990. No Hawksbill Turtle meat or shell were observed for sale during this survey at Koki Market, though regular inspection at Boroko Market saw on average one to six women vendors selling tortoiseshell earrings, bracelets and combs. Unworked scutes and juvenile carapaces (unworked and polished) were also observed on rare occasions. At this time, the turnover in tortoiseshell products was not considered high (Hirth and Rohovit, 1992).

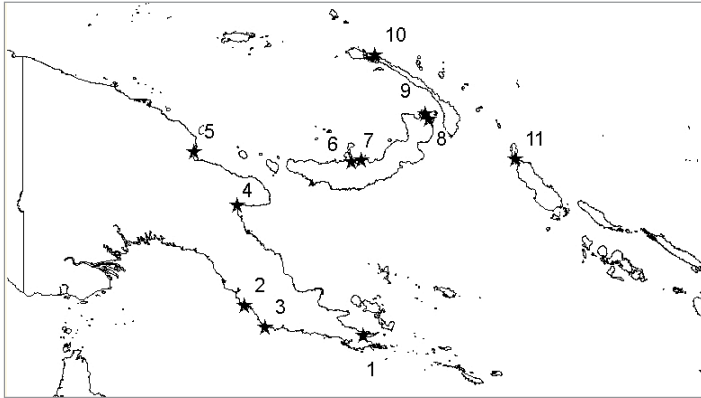


Figure 1.

**Map of the survey locations in Papua New Guinea.**

1. Alotau, Milne Bay Province; 2. Port Moresby, National Capital District; 3. Hula Village, Central Province; 4. Lae, Morobe Province; 5. Madang, Madang Province; 6. Kimbe, West New Britain Province; 7. Hoskins, West New Britain Province; 8. Kokopo, East New Britain Province; 9. Rabaul, East New Britain Province; 10. Kavieng, New Ireland Province; and 11. Buka, Autonomous Region of Bougainville.

Kwan (1991) estimated that from 1985 to 1987, Hawksbill Turtles accounted for two to five percent of the catch in the turtle meat fishery in Daru, Western Province. During a longer-term survey in the New Ireland Province during the early 1980s, less than five percent of all marine turtles harvested for sale were Hawksbill Turtles (Wright and Richards, 1983).

More recent studies have shown that the level of take can be high in some areas. For example, in the islands of the Calvados Chain, Milne Bay Province, a survey conducted from September 1998 to April 1999 reported 50 Hawksbill Turtles (14 of which were traded to other islands), and eggs from 196 nests were harvested from islands in the territorial waters claimed by Brooker Islanders in the Louisiade Archipelago (Kinch, 1999, 2002, 2003a). Recent socio-economic assessments and marine resource reviews conducted for New Ireland, Morobe and Milne Bay Provinces over 12-month periods, reported that marine turtles were harvested by coastal and island villagers (National Fisheries Authority, 2005, 2006,

2007a,b,c), with stuffed juvenile Hawksbill Turtles occasionally observed for sale in Kavieng market in New Ireland Province (National Fisheries Authority, 2007b). In Milne Bay Province, between two and eight live juvenile Hawksbill Turtles were regularly cited on sale in the Alotau town market, with additional turtle carcasses also for sale (Kinch, 2003b). Koczberski *et al.* (2006) report that the decline in marine turtle abundance in West New Britain Province is linked to the sale of turtle meat and eggs to immigrant workers on the local oil palm estates.

**CURRENT ASSESSMENT**

**Methods**

Between May and August 2007, the lead author conducted surveys of retail outlets in nine regional centres across eight provinces in Papua New Guinea (Figure 1).

Province	Use	Reference
Central	Necklaces for bride price, earrings and ceremonial belts	Seligman, 1910; Pritchard, 1979
East New Britain	Needles for tattooing young girls	Pritchard, 1979
East Sepik	Fish-hooks	Pritchard, 1979
Gulf	Fish-hooks	Turner, 1878
Madang	Carved shell for bride price	Pritchard, 1979
Manus	Ceremonial belts, rings, earrings, bracelets, headbands, spoons, combs and fish-hooks, and as a musical complement (scattered on the ground like a deck of cards to produce sound)	Pritchard, 1979; Spring, 1981
Milne Bay	Earrings, rings, lime sticks (used to transfer lime to the mouth when chewing betel nut), combs, sewing needles and as garden magic (ground up with egg shells and mixed with soil when planting yams)	Edge-Partington, 1890–1898; Pritchard, 1979; Kinch, 1999, 2002, 2003a
Morobe	Fish-hooks	Kinch, pers. obs.
New Ireland	Jewellery	Pritchard, 1979
Torres Strait	Fish-hooks, scrapers, in-lay on shell, masks and combs	Edge-Partington, 1890–1898
West New Britain	Carved shell for bride price	Pritchard, 1979

**Table 1. Tortoiseshell use in Papua New Guinea and the Torres Strait.**

The aim was to gain a contemporary overview of the country's trade in marine turtles and marine turtle products. Information such as volumes of trade, number of traders, trade dynamics, possible sources of marine turtles, species involved in the trade, trade routes, and end destinations was gathered through informal and semi-structured interviews with market sellers, artefact retailers, hotel staff and discussions with members of the public.

Various government agencies, conservation non-governmental organizations and local universities were also consulted. Data from the UNEP-WCMC CITES trade database on Hawksbill Turtle trade from 1950 to 2006 were analysed and compared across the Oceania region.

Prices quoted were in Papua New Guinea Kina (PGK), though all prices quoted in this report have been converted into USD; in May 2007, the exchange rate was PGK0.33 to one US dollar.

### National legislation

Currently, of the six turtle species found in Papua New Guinea, the Leatherback *Dermachelys coriacea* is protected under government legislation (Kula and George, 1996). The *Flora and Fauna Protection and Control Act* (1966) stipulates that any person who knowingly buys, sells, offers or consigns for sale, or is in possession or in control of a protected animal is liable to a fine of PGK500 (USD165).

This Act also provides for the establishment of Wildlife Management Areas (WMAs). WMAs provide a mechanism for the local control of fauna on land and in waters held under customary ownership. To date, WMAs have been the most used form of area-based conservation in Papua New Guinea, and can act as sanctuaries for the protection of endangered species depending on the rules developed for resource owners' specific needs. The establishment of a WMA requires the demarcation of social and spatial boundaries to be recognized in consultation with the Department of Environment and Conservation (DEC) and Local Level Government (LLG), and the formation of a Wildlife Management Committee by ministerial appointment, which draws up a schedule of rules and penalties.

In Papua New Guinea, most nesting beaches and marine habitats are owned by a large number of clan and sub-clan groups whose tenure rights are recognized in the National Constitution. Only the open seas, mineral resources, previously alienated land and protected fauna are vested in the State. Subsequently, any plans for the sustainable use or conservation of Hawksbill Turtles in Papua New Guinea will require innovative methods that recognize community rights to sea turtle resources and habitats, while attempting to conserve (and 'recover') the species. Thus, there is a need to adopt an approach that strengthens local conservation practices on one hand, but also strengthens or develops appropriate legislative and policy frameworks.

Other legislation in Papua New Guinea that could also be applicable for Hawksbill Turtle conservation and sustainable management include:

- *Customs (Prohibited Exports) Regulation* (1963) regulates the export of flora and fauna from fishing, pastoral, agricultural and forestry industries;
- *Land Groups Incorporation Act* (1974) allows for the formal recognition of social groups over their territory and natural resources;
- *Conservation Areas Act* (1978), like the *Flora and Fauna Protection and Control Act* (1966), allows for a variety of protective regimes on land and waters under customary tenure;
- *Firearms Act* (1978) restricts the use of weapons and explosives;
- *International Trade (Fauna and Flora) Act* (1979) regulates and restricts the export of CITES species;
- *International Trade (Fauna and Flora) (Fauna) Regulation* (1982) prescribes the documentation required to trade in CITES-listed fauna, to and from Papua New Guinea;
- *Village Courts Act* (1989) lists the 'prescribed offences' which can be dealt with in village courts;
- *Organic Law on Provincial Governments and Local-level Governments* (1997) regulates the respective rights and obligations of the various levels of government in the field of resource management; allows for the development of Ward or Local Level legislation under Sections 42 and 44, which could be used to draw up local-level conservation laws that could potentially ban Hawksbill Turtle and egg take, and establish nesting beach closures;
- *Fisheries Management Act* (1998) provides the framework for policy and decision to promote the management and sustainable development of fisheries;
- *Fisheries Management Regulation* (2000) sets out the procedures, fees and conditions for the licensing of vessels and establishments. The conditions include a requirement for licensed export vessels or establishments to operate in accordance both with Papua New Guinean law and the requirements of importing countries.

### International Conventions

Papua New Guinea has been a Party to CITES since 1976. Atlantic Hawksbill Turtle populations were included in CITES Appendix I in 1975 and Pacific populations in Appendix II. In 1977, Pacific Hawksbill Turtle populations were also included in Appendix I.

Since the Hawksbill Turtle is listed in CITES Appendix I, the international trade in tortoiseshell products from Papua New Guinea is generally prohibited. Under strict regulations, CITES allows non-commercial trade in Appendix I species only in exceptional circumstances, such as for scientific or zoological purposes, if such trade will not jeopardize their chances for survival. For such non-commercial trade to occur in accordance with CITES, a valid import permit and a valid export permit or re-export certificate are required. Therefore, if a person wishes to take any tortoiseshell product(s) out of Papua New Guinea, an export permit should be obtained from DEC.

DEC in Papua New Guinea is responsible for the national control of the legal international trade in CITES-listed species, and the application of all measures to stop any illegal international trade of these species. The *International Trade (Fauna and Flora) Act* (1979) implements Papua New Guinea's obligations as a Party to CITES by controlling and regulating the trade, possession, transport, exportation and importation of certain fauna and flora. The *International Trade (Fauna and Flora) (Fauna) Regulation* (1982) prescribes the forms and permits to import, export or re-export fauna listed in CITES Appendix I, II or III, to and from Papua New Guinea.

Item	Quantity	Price range (USD)	Price mean (USD)	Total value (USD)
Hawksbill (tortoiseshell) products	1436	0.33–165.00	8.20	11696.81
Hawksbill Turtle carapace mask	1	49.50	49.50	49.50
Green Turtle carapace	4	8.25–66.00	31.35	125.40
Olive Ridley Turtle carapace	1	16.50	16.50	16.50
Freshwater turtle carapace	8	1.65–6.60	5.98	47.84
Freshwater turtle carapace mask	3	13.20	13.20	39.60
<b>Total</b>	<b>1453</b>			<b>11 975.70</b>

**Table 2. Summary of turtle products observed on sale in Papua New Guinea, 2007.**

Note: Prices quoted were in Papua New Guinea Kina (PGK), though all prices quoted in this report have been converted into USD; in May 2007, the exchange rate was PGK0.33 to one US dollar.

Unfortunately, CITES regulations appear to be minimally promoted or policed at present by DEC, as is evident by the sales of tortoiseshell items in duty-free shops at Jackson's International Airport. All direct flights from Papua New Guinea are to countries party to CITES: Australia has been a Party since 1976, China since 1981, Japan since 1980, Philippines since 1981, Singapore since 1987, and Solomon Islands since 2007.

While CITES addresses international trade in endangered species, the *Convention on Migratory Species of Wild Animals* (CMS, or Bonn Convention) attempts to address problems of endangered species at a national level, and encourages international co-operation to achieve conservation objectives (Hykle, 2000). Marine turtles follow a migratory life history, and therefore they travel between national territorial waters. CMS is an inter-governmental treaty, administered under the United Nations Environment Programme, and is concerned with the conservation of migratory species of wildlife and habitats on a global scale. The Hawksbill Turtle is listed in Appendix I and II of CMS. CMS Parties strive to protect these animals, conserve or restore habitats and control factors that might endanger them. Papua New Guinea is not currently a Party to CMS. The *Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia* (IOSEA MoU) was created to provide a wider regional agreement which applies to the coastal States of the Indian Ocean and South-East Asia and adjacent seas, extending eastwards towards the Torres Strait. Papua New Guinea has been highlighted as a range State for this agreement, but is currently not a signatory to the IOSEA MoU.

Of the numerous formal global instruments and regional agreements that provide a legal framework for the conservation and management of Hawksbill Turtles in the New Guinea region, Papua New Guinea is signatory to:

- *Convention on Conservation of Nature in the South Pacific* (1976), which establishes a broad framework for nature conservation in the South Pacific region, particularly in relation to migratory and endangered species or the preservation and management of wildlife habitat and terrestrial ecosystems;

- *United Nations Convention on the Law of the Sea* (1982) (entered into force 1994), which established the Economic Exclusion Zones and areas of jurisdiction in the oceans, and developed general rules for fishery conservation and management;
- *Convention for the Protection of the Natural Resources and Environment of the South Pacific Region* (1986), which also created a regional approach to the sea turtle protection, the South Pacific Regional Marine Turtle Conservation Project;
- *Convention on Biological Diversity* (1992), an international treaty which has an objective to develop national strategies for the conservation and sustainable use of biological diversity;
- *The Ramsar Convention on Wetlands* (1971) (entered into force 1993), an international treaty for the conservation and sustainable utilization of wetlands;
- *The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks* (1995), which incorporates the precautionary approach to the management of pelagic fisheries.

In 2002, the World Summit on Sustainable Development called for governments, inter-governmental organizations and NGOs to develop partnerships to implement on-the-ground conservation and sustainable development actions for species and ecosystems in danger of extinction. Currently, WWF has an ecoregional programme in Bismarck-Solomon Seas Eco-region which has developed a non-legally-binding, tri-national partnership Memorandum of Understanding (MoU) with government representatives from Indonesia, Papua New Guinea and Solomon Islands, and partners for the recovery of Leatherback Turtles (Kinch, 2006). This MoU has been devised to explore ways that governments, institutions and communities can effectively manage and conserve nesting sites, feeding areas and migratory routes in and across these three countries. The MoU also attempts to address issues such as take, technical capacity, and developing sustainable livelihood options through a network of communities and partnering of conservation NGOs, science and fisheries institutions (Wilson *et al.*, 2006). A similar type of agreement should also be developed for Hawksbill Turtles that share boundaries across countries in the Western Pacific Region (encompassing north-eastern Australia, New Guinea, Solomon Islands, Vanuatu, Fiji and New Caledonia in the south-western Pacific Ocean).



**RESULTS AND DISCUSSION**

The tortoiseshell trade in Papua New Guinea is centred on the manufacture of jewellery and motifs (decorative designs or patterns, such as Chinese dragons or bird-of-paradise) for domestic sale particularly targeting the international tourist market. Across the eight provinces surveyed, 59 retailers were visited with 32 observed selling marine turtle products. During this survey, all craftsmen interviewed—with the exception of one artisan family—were also involved in the manufacture of marine shell jewellery and the production of wooden carvings.

A total of 1441 marine turtle and 12 freshwater turtle products was observed for sale in retail outlets during this study (Table 2); the trade in marine turtles comprised three species: Hawksbill, Green and Olive Ridley. Ornamental carapaces of Green (n=4) and Olive Ridley Turtles (n=1) were seen for sale in Madang and Morobe Provinces. However, it was the sale of Hawksbill Turtles that constituted 98.8% of the trade in marine turtles recorded across Papua New Guinea. This trade included 1436 tortoiseshell items, comprising 14 different products (Tables 3 and 4). All of these were counted separately (except for earrings which were counted as pairs). The majority were jewellery items (94.2%), particularly earrings (50.6%) and bangles (22.5%). Jewellery prices varied greatly depending on the craftsmanship and tortoiseshell quality (USD0.33–165.00). Some jewellery pieces, such as rings, were more elaborate and combined tortoiseshell set in silver and/or with the addition of pearls in the design (USD21.45–165.00).

**Port Moresby, National Capital District**

Port Moresby, the nation’s capital, was observed to be the main site of sale for Hawksbill Turtle products, contributing to 76.8% of the trade recorded during this survey. Of the sixteen retailers surveyed in the city, 12 were found to be selling Hawksbill Turtle products. Most of the trade (29.4%) was observed in Ela Beach market (which takes place on the last Saturday of each month). Five artisans at this market were selling a large variety of tortoiseshell jewellery products (n=369) for between USD3.30 and USD14.85. Also on sale at Ela Beach market was a selection of ornate tortoiseshell motifs (n=51), crafted from Hawksbill Turtle scutes into various designs of animals, birds and Chinese dragons. Prices for

Item	Port Moresby, National Capital District	Alotau, Milne Bay	Madang, Madang	Lae, Morobe	Kimbe and Hoskins, West New Britain	Kokopo and Rabaul, East New Britain	Kavieng New Ireland	Buka, Bougainville	Total
<b>JEWELLERY</b>									
Bangles	295		3		1	9	15		323
Combs	29								
Earrings	529	72	3	48	10	44	6	15	727
Necklaces	39	3	12	1	24	8	7		94
Pendants	25								25
Hairpins	26						6		43
Rings	104			1		11	7		112
<b>MISCELLANEOUS</b>									
Carving			1						1
Masks			1						1
Motifs	51						1		52
Key-rings	4						3		15
Letter openers	2								2
Fish-hooks			4						7
Guitar picks				3					5
<b>TOTAL</b>	<b>1104</b>	<b>83</b>	<b>24</b>	<b>58</b>	<b>35</b>	<b>72</b>	<b>45</b>	<b>15</b>	<b>1436</b>

Table 3. Tortoiseshell items observed for sale in Papua New Guinea.



HAWKSBILL TORTOISESHELL BIRD-OF-PARADISE MOTIF



HAWKSBILL TORTOISESHELL JEWELLERY



HAWKSBILL TORTOISESHELL CARVING



SELECTION OF HAWKSBILL TORTOISESHELL MOTIFS



HAWKSBILL CARAPACE AND MASK

PHOTOGRAPHS: J. KINCH

these motifs ranged from USD16.50 for a small animal design, to USD165 for a large Chinese dragon, which was one of the most expensive tortoiseshell products seen during this survey. The bird-of-paradise, a national symbol of Papua New Guinea, featured heavily in the designs of tortoiseshell motifs and jewellery items. Presumably, most of the items for sale at Ela Beach were targeted at the tourist market.

The tortoiseshell jewellery on sale in Port Moresby was sourced mostly from one artisan family based at Hula village, Central Province, approximately 2.5 hours drive to the east of Port Moresby. This family has been making tortoiseshell products for 15 years, and regularly sells tortoiseshell jewellery and other items at Ela Beach Market. They use between nine and 15 Hawksbill Turtles a month. Purchases of tortoiseshell for their handicrafts are by-products of the turtle meat fishery and trade. Hawksbill Turtles are also sourced from two turtle hunters in the village and tortoiseshell scutes are obtained from villagers in Abau to Fishermen Islands for USD9.90 per carapace or bundle of scutes. The family also supplies specialized jewellery to hotel gift shops, duty-free shops at Jackson's International Airport in Port Moresby, as well as taking orders from some supermarkets. They also take orders from departing tourists, often of Asian nationality, who are returning home from Papua New Guinea.

#### *Alotau, Milne Bay Province*

Milne Bay Province has a history of traditional tortoiseshell manufacturing for the production of lime sticks and earrings (particularly for Trobriand Island girls). Five retailers were visited, three of which were found to be selling tortoiseshell products. All jewellery items observed on sale in Alotau had been obtained from a travelling trader three years earlier, who had originally sourced the tortoiseshell earrings and necklaces from the artisanal family at Hula village in Central Province.

#### *Madang, Madang Province*

Two hotel gift shops were observed to be selling Hawksbill Turtle products. Jewellery items seen on sale there had reportedly been obtained either from a local artisan based in Madang, from a travelling salesman who had sourced them from an artisanal family located at Kombe village in West New Britain Province, or from the Melanesian Arts handicraft shop in Lae, Morobe Province.

Whilst no tortoiseshell jewellery was observed on sale in the local markets, a market in the grounds of a resort offered several freshwater turtles (n=11, 15.5–24.8 cm curved carapace length (CCL), USD1.65–13.20), an Olive Ridley carapace (44.2 cm CCL, USD16.50, on sale for three years) and a Green Turtle carapace (44.2 cm CCL, USD26.40). Two masks made from the carapaces of a juvenile Hawksbill (33.2 cm CCL, USD49.50) and Green Turtle (39.8 cm CCL, USD66) were also observed. These masks were an artistic innovation not previously observed or known to this report's primary author, and were made by applying mud to the outside of the carapace and then painting Sepik mask designs.

**Lae, Morobe Province**

In Lae, local artisans from Tami Island craft and sell ‘traditional’ fish-hooks from tortoiseshell. Jewellery items observed on sale were obtained from local artisans or travelling traders who had acquired them from other areas, notably from the artisanal family from Hula village in Central Province.

On display, but not for sale, at the Melanesian Arts handicraft shop was a stuffed Hawksbill Turtle (51.4 cm CCL), a juvenile Hawksbill carapace (19.2 cm CCL) and a Green Turtle carapace (44.8 cm CCL). The stuffed Hawksbill Turtle had reportedly been obtained from an Asian man who bought the item but was unsuccessful in taking it out of the country. A handicraft centre had one polished Green Turtle carapace on sale and an assortment of 48 pairs of earrings which were sourced from travelling traders from the artisanal family at Hula village, Central Province, and traders from Madang.

**Kimbe and Hoskins, West New Britain Province**

The tortoiseshell trade in West New Britain Province was centred around one artisanal family located at Kombe village. The artisan interviewed had been making tortoiseshell jewellery since 2002, and used five to six Hawksbill Turtles a year. Four retail shops in hotel resorts were visited, though no marine turtle products were observed. The local market and stall at the domestic Hoskins Airport were the only retailers dealing in Hawksbill Turtle products. The market seller had 10 sets of assorted earrings and four necklaces displayed for sale, whilst the stall at the airport had 20 assorted necklaces and one bangle for sale.

**Kokopo and Rabaul, East New Britain**

Eight retail shops in hotel resorts were surveyed in Kokopo and Rabaul, though no Hawksbill products were

observed. Two retailers at the local Kokopo market were selling tortoiseshell jewellery. Local artisans in East New Britain Province consisted of one artisanal family in Kokopo, who make tortoiseshell jewellery to supplement their income. This family sourced tortoiseshell from local fishers who catch Hawksbill Turtles for subsistence. A voluntary community centre which sold artefacts to finance its operational costs, was observed selling pieces of tortoiseshell jewellery. This centre occasionally bought tortoiseshell items from a Sepik man who lived in Rabaul.

**Kavieng, New Ireland Province**

Artisans in New Ireland Province were located at Nusalik Island, just across from the provincial capital, Kavieng, which also hosts a popular tourist retreat. A family of artisans who sold tortoiseshell items to tourists visiting the island consisted of three women, who used three to four Hawksbill Turtle carapaces annually to craft their jewellery. These turtles were harvested from Tigak Islands by other family members. They also supply jewellery to two hotels and two shops in Kavieng.

A number of Green (39.8–102.9 cm CCL; n=28) and Hawksbill Turtle (34.2–61.8 cm CCL; n=15) carapaces were on display at the resort. These specimens had been supplied by Emriau Marine Products, which had obtained the carapaces from an auction of items that had been confiscated by the National Fisheries Authority. Various other resorts and hotels in the province also sold an assortment of jewellery items (USD5.61–24.75), which were also sourced from artisans from Nusalik Island.

**Buka, Autonomous Region of Bougainville**

Only one person was found to be selling Hawksbill Turtle products in Buka, capital of the Autonomous Region of Bougainville. This market vendor sources his tortoiseshell jewellery from visiting traders from the

Item	Quantity	Price range (USD)	Price mean (USD)	Total value (USD)
<b>JEWELLERY</b>				
Bangles	323	3.30–165.00	7.97	2574.31
Combs	29	11.55–69.30	15.38	446.02
Earrings	727	0.33–69.30	4.74	3445.98
Necklaces	94	4.13–58.41	8.82	829.08
Pendants	25	3.96–61.05	12.88	322.00
Hairpins	43	6.60–28.05	8.99	386.57
Rings	112	2.31–31.02	7.70	862.40
<b>MISCELLANEOUS</b>				
Carving	1	33.00	33.00	33.00
Masks	1	49.50	49.50	49.50
Motifs	52	16.50–165.00	48.30	2511.60
Key-rings	15	3.96–49.50	12.66	189.90
Letter openers	2	4.95	4.95	9.90
Fish-hooks	7	10.89–17.49	14.85	103.95
Guitar picks	5	3.30	3.30	16.50
<b>TOTAL</b>	<b>1436</b>			<b>11 780.71</b>

Table 4. Prices of tortoiseshell items observed for sale in Papua New Guinea.



Year	Destination	Volume	Item	Purpose
1976	Australia	6	Carcass	Not reported
1977	Australia	9	Carcass	Not reported
1977	Australia	1	Carapace	Not reported
1977	Australia	3	Unspecified	Not reported
1977	USA	1	Unspecified	Not reported
1978	Australia	4	Carcass	Personal
1978	Australia	5	Carapaces	Personal
1978	Australia	3	Leather items	Personal
1978	UK	4	Carapaces	Personal
1978	UK	1	Leather items	Personal
1979	Australia	1	Carcass	Personal
1980	USA	4	Carvings	Not reported
1989	UK	1	Carapaces	Personal
1990	USA	2	Carvings	Not reported
1991	Australia	1	Carapace	Personal
1991	New Zealand	1	Carapace	Personal
1993	UK	1	Carvings	Personal
1993	New Zealand	1	Carapace	Personal
1993	New Zealand	1	Carvings	Personal
1994	Australia	29	Carvings	Commercial
1994	New Zealand	1	Carapace	Commercial
1994	Unknown	7	Carapaces	Commercial
1995	Australia	2	Carvings	Personal
1995	Australia	14	Carvings	Education
1996	Australia	2	Carapaces	Commercial
1996	Netherlands	16	Carvings	Personal
1996	USA	1	Carapace	Not reported
1997	Australia	2	Carapaces	Personal
1998	Philippines	7	Carvings	Personal
1998	USA	17	Carvings	Commercial
2001	Australia	1	Carapace	Personal
2001	Australia	1	Carvings	Personal
2001	Australia	2	Carvings	Personal
2004	Poland	1	Carapace	Not reported

**Table 5. Tortoiseshell gross exports from Papua New Guinea, 1976-2004.** Source: UNEP-WCMC

Solomon Islands. He usually buys 100 earrings, two to three times a year. The tortoiseshell jewellery on sale was originally manufactured on Malaita, Solomon Islands.

### International trade from Papua New Guinea

Statistics on Hawksbill tortoiseshell trade are derived from annual reports filed by CITES member States in fulfillment of their obligations under Article VIII of CITES, which states that each Party shall maintain records of trade in specimens of species included in the CITES Appendices. Since the Pacific Hawksbill Turtle has been listed in at least Appendix II since 1975, all records of international trade in Hawksbill Turtle should have been reported by Papua New Guinea under its obligation as a CITES Party. CITES annual reports recorded no evidence of substantial trade in turtle products directly from Papua New Guinea (Table 5). Between 1976 and 2004, six records document commercial exports of Hawksbill Turtle products, consisting of carapaces and carvings. Most exports of Hawksbill Turtles were to Australia and the USA as personal possessions.

The statistical database of the National Fisheries Authority reports 80 kg of tortoiseshell purchased by fishing companies in the country between 1995 and 1999. Since 1999, there have been no more recorded purchases or reported exports.

Recent surveys by the Japanese Wildlife Conservation Society (2004) amongst traders and artisans across Japan, found no decline in the production or sales of tortoiseshell but surprisingly there was no significant reduction in reported stocks held by traders. This finding suggests that tortoiseshell was potentially being obtained from sources other than the reported stocks, with Singapore appearing to be the gateway for illegal shipments of tortoiseshell (and products) from Indonesia and other Asian countries to Japan (JWCS, 2004). It is possible that tortoiseshell is being taken out of Papua New Guinea illegally, as it is reported that beche-de-mer (dried sea cucumbers) is purchased by Asian nationalities (mostly Malaysians and Chinese) working on logging and fishing vessels (Kinch, 2004; Kinch *et al.*, 2007). It may also be possible that tortoiseshell is being sold in Indonesia's Papua Province (western half of New Guinea island through Vanimo in Papua New Guinea's West Sepik Province to the Indonesian city of Jayapura). This requires further investigation, as East Sepik and West Sepik (also called Sandaun) Provinces were not visited during this assessment.

### CONCLUSIONS

The trade in Hawksbill Turtles continues in coastal towns throughout Papua New Guinea. The trade is mainly in the form of tortoiseshell jewellery or motifs, which supply a domestic market and potentially target international tourists as buyers. An increase in tourist purchases could motivate an increase in Hawksbill Turtle harvest to supply tourists with tortoiseshell products, with possible increases in production in the Central, Madang, New Ireland and Milne Bay Provinces. The issue of increased trade in raw scutes is also a possibility for Western and the two Sepik provinces.

In 2007, trade in Hawksbill Turtles was taking place throughout Papua New Guinea although the level of trade appeared to be low with a slow turnover. The nation's capital, Port Moresby, was observed to be the location of sale of the majority of Hawksbill Turtle products during this survey. Dealers and artisans appeared to source Hawksbill Turtles mainly from subsistence or opportunistic catches. However, the level of this take remains unquantified. Furthermore, most of the products observed in Papua New Guinea were manufactured by just a few artisanal families, which then distribute their products in coastal towns across the country.

When compared with the level of trade and supply to Viet Nam (Duc and Broad, 1995; TRAFFIC Southeast Asia-Indochina, 2004; van Dijk and Shepherd, 2004) and some locations in the Caribbean (Bräutigam and Eckert, 2006), the trade in Papua New Guinea is negligible on a global scale. Strengthening national legislation to protect marine turtles, along with increasing the education of buyers, particularly foreign tourists, sellers and relevant

authorities, would contribute greatly to the conservation of marine turtle populations in the Western Pacific Region (encompassing north-eastern Australia, New Guinea, Solomon Islands, Vanuatu, Fiji and New Caledonia in the south-western Pacific Ocean).

## RECOMMENDATIONS

Even though the trade in tortoiseshell products in Papua New Guinea is considered minor, management efforts should be strengthened, particularly the roles and responsibilities of DEC, which is the designated authority tasked with managing Papua New Guinea's marine turtle resources. Thus the following recommendations are made to DEC:

- Implement an education and awareness programme in conjunction with the Tourism Promotion Authority and airlines that service Papua New Guinea (national airlines Air Niugini and Airlines PNG, and their respective codeshare partners, QANTAS and Virgin Blue). This could entail the distribution of pamphlets and the placement of signs in gift and artefact shops, local markets and at Jackson's International Airport (and other airports that are planned to open in the future to accept international flights);
- Implement an education and awareness programme for government officers, including Customs officials, as well as general campaigns for the public;
- Seek funding and technical support to implement and enforce CITES regulations effectively;
- Seek funding and technical support to review the status of the Hawksbill Turtle in Papua New Guinea and change its status to a 'Protected Species' under the *Fauna (Protection and Control) Act* (1966) if deemed applicable;
- Increase government participation in regional agreements that provide an operational basis for a unified, science-based and multilateral response to the management, recovery and sustainable use, whether extractive or non-extractive, of marine turtles in the Western Pacific Region;
- Conduct an assessment of the subsistence and semi-commercial take to quantify and characterize marine turtle exploitation at the local, provincial and national level, including trade and marketing patterns, and the importance to livelihoods of the income derived from marine turtle exploitation;
- Provide support for the establishment of marine turtle monitoring programmes that aim to protect nesting and foraging areas, as well as limiting the take of animals and eggs;
- Implement an outreach strategy for the general public, with the aim of increasing awareness and appreciation of marine turtles, turtle conservation and sustainable management.

Finally, since Hawksbill Turtles in Papua New Guinea are known to migrate to neighbouring countries, and in the interests of further understanding the tortoiseshell trade and the general impacts of harvesting, a similar trade assessment in the Solomon Islands, Vanuatu and Fiji should be conducted. Trade should also be investigated in West Papua, Indonesia, to determine any cross-border trade.

## ACKNOWLEDGEMENTS

The authors would like to thank the following institutions and staff in Papua New Guinea for their assistance during the assessment: Department of Environment and Conservation, National Fisheries Authority, WWF, The Nature Conservancy (TNC), Conservation International, and Motupore Island Research Centre of the University of Papua New Guinea, Port Moresby, National Capital District; Mahonia na Dari and TNC in Kimbe Bay, West New Britain; WWF and TNC in Madang, Madang Province, and National Fisheries College in Kavieng, New Ireland Province. Provision of financial assistance by The Department of the Environment, Water, Heritage and the Arts in Australia to conduct this survey is also acknowledged.

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