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# Turtle

## shells and derivatives

A look at the trade in marine turtle shells, products and other species of special concern in Viti Levu, Fiji Islands.



A report from the field by  
**Merewalesi Laveti**

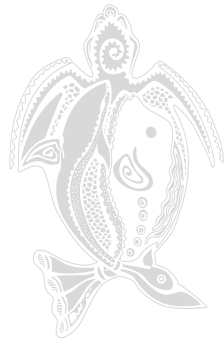
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## Summary

The declining marine turtle populations in Fiji has become a growing concern over recent years. Unlimited exploitation of marine turtles for both subsistence and traditional purposes have imposed a threat to these vulnerable turtle populations. Veitayaki (1995) explained that the use of marine turtles in traditional occasions is unlimited where the number of turtles exploited represents the success per catch per effort in a village setting.

A few studies have illustrated the use of marine turtles in Fiji. According to Guinea (1993), a tortoise industry was thriving in Fiji in the early 1940s. In 1998, Fiji became a signatory country to the Convention on International Trading of Endangered Wild flora and fauna (CITES). Fiji later enforced the Endangered and Protected Species Act (1998) and a second Turtle Moratorium (2004 -2008) after the first from 1995 - 2000. In September 2009, a third Moratorium was endorsed and is in effect from 2009 - 2018. These policies and associated regulations contribute to the implementation of Fiji's commitments to CITES at local level and further enhances the protection and conservation of marine turtles.

A lack of dedicated research aimed at quantifying the illegal use of marine turtles in Fiji has been one of the many factors hindering informed decision making in the conservation and management of marine turtles. In response to this a survey initiated by the Department of Environment and monitored by the Institute of Marine Resources aimed to identify the efficacy of the legally binding regulations in place. The survey was initially conducted in December 2006 with a follow up assessment in April 2007.



**Results from the survey of 102 shops in 9 municipal markets recorded the following:**

|                                       |                  |
|---------------------------------------|------------------|
| • Total hawksbill turtle shells sold: | 28               |
| ● Curved carapace length range:       | 37.5cm to 73.9cm |
| ● Mean CCL:                           | 44.5cm           |
| • Total green turtle shells sold:     | 29               |
| ● Curved carapace length range:       | 40cm to 66.5cm   |
| ● Mean CCL:                           | 49.9cm           |



Hawksbill turtle (*Eretmochelys imbricata*)  
© Nils Aukan / WWF-Canon



The majority of the shells for both species are below adult sizes for these species in the region (see Hirth 1997 and Marcovaldi et al. 1999), indicating that most are juveniles, with a few carapaces of sub-adults (Laveti & MacKay, 2008).

A number of derivatives (bangles, combs, earrings), were still being sold in the municipal markets of the major towns and cities of Viti Levu during the early years of the survey (2006-2007). A follow up market survey conducted by the Institute of Marine Resources in 2007 suggests that the trade of turtle shells and derivatives in certain municipal markets has decreased (Laveti & MacKay, 2008). However, particular towns like Lautoka are found to be strictly monitored by the Department of Fisheries as it indicated nil trading of turtle shells and derivatives during the survey period in 2006 and 2007 (ibid).

**The most recent survey focused on marine turtle trade was conducted in December 2008 and 2009 primarily to:**

1. identify any change in the marine turtle trade along the markets around Viti Levu;
2. monitor the effectiveness of the Turtle Moratorium (expired in December 2008 and extended from 2009-2018)

The 2008 and 2009 market survey recorded no turtle shells being traded in the markets of Suva, Sigatoka, Nadi, Lautoka, Ba, Tavua, Rakiraki and Nausori. However, a few derivatives such as bangles and earrings were found displayed in some of the handicraft shops in Sigatoka and Nadi town. This three year monitoring of municipal market has indicated a significant decrease in the trade of marine turtles shells and their derivatives from 2006 – 2009. Results also indicate a change in behaviour of vendors which has been brought about through ongoing campaigns to raise public awareness on the issue of endangered marine turtles in Fiji. The general response received from vendors indicated that they are aware of the need to conserve and protect marine turtles and the current by laws that prohibit the trade of turtles and its derivatives.

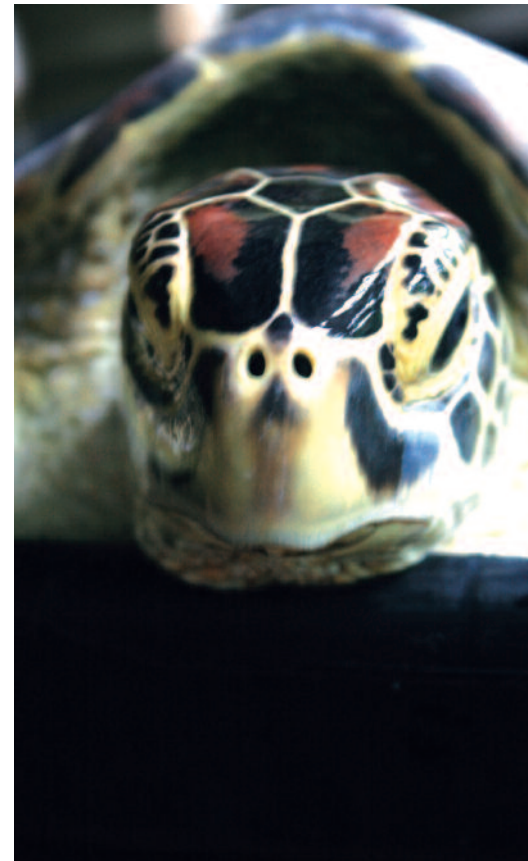
An interesting observation has been that while there has been a noticeable decline in the sales of turtle shells and derivatives, other species of special concern were seen to be continually sold in fish and municipal markets around Fiji. Records of juvenile Black tip shark and Hammerhead shark was selling for a low value of two individuals for FJ\$5.00 in a municipal market. This illustrates the lack of awareness and enforcement on fishing size limits and species that needs prioritising for protection and conservation.



## 1.0 Introduction

Marine turtles have been extensively used as a resource for many centuries by numerous cultures around the world. For centuries, craftsmen and voyagers have worked the thick shell plates from the hawksbill turtle (*Eretmochelys imbricata*) for ornaments while finding the green turtle (*Chelonia mydas*) meat and eggs to be delicacies (Adam, 2003). Turtles have been valued for one attribute or another and have provided everything from basic sustenance to luxury items (Allan, 2007).

While turtle populations in the wild are subjected to a wide variety of natural hazards such as predators and storms, these threat thresholds are significantly heightened by the trading of turtles for the derived products.



Green turtle (*Chelonia mydas*)  
© Penina Solomona / WWF SPP0



Conducting interviews and market surveys are research methods that have been proven by Tambiah (1999) to provide opportunities for summarising information from knowledgeable people, compiling information that has been maintained only in an oral tradition or when written information is scarce, supplementing data collected by direct observations and sharing of information through collaboration. Therefore it enables information on the exploitation of marine turtles to be quantified. It is also a valuable tool to uncover biological information such as species present and size distributions.

Monitoring the use of marine turtles in Fiji is important to decision making in relation to their conservation and management. While the Department of Fisheries is able to monitor the number of turtles killed via the exemptions issued under the provisions of the Turtle Moratorium, there is not enough capacity to monitor the trading of marine turtles in markets. The figure for the numbers of turtles being traded for their meat, shell or eggs in these instances therefore is largely unknown. The ambiguous information has initiated this

assessment looking at monitoring the trade of marine turtles in municipal markets and handicraft shops located in Suva, Sigatoka, Nadi, Lautoka, Ba, Tavua, Rakiraki, Korovou and Nausori towns.

As a supplement to the review of marine turtle trade in Fiji for the past two years, a rapid field investigation into the trade of marine turtle products with a focus on the Hawksbill shell products was undertaken by WWF in December 2008 and 2009. The same location was chosen for this survey to allow for any comparison of data and importantly to identify any changes in terms of assessing:

1. differences in the number of turtle shells and derivatives traded over two years
2. the level of marine turtle education and awareness through out Fiji
3. the effectiveness of the five years turtle moratorium (2004-2008)



## 2.0 Study Site

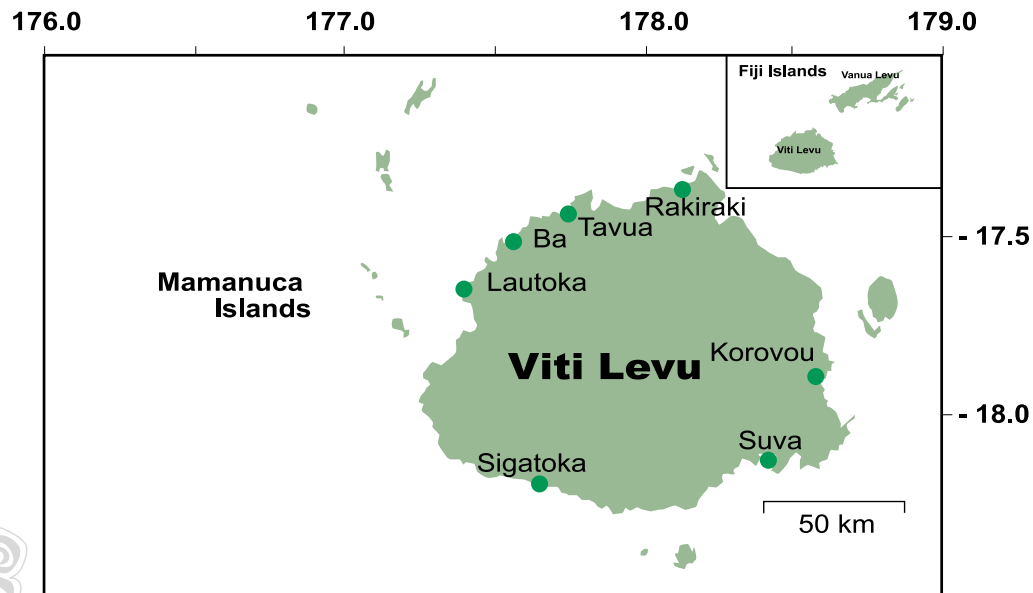


Figure 1: Map of the main towns and cities in Viti Levu Island

The surveyed sites are located around the island of Viti Levu (Figure 1). The major towns are Nadi, Sigatoka, Ba, Tavua, Rakiraki and Nausori while Suva and Lautoka are designated cities. Viti Levu has an estimated population of 500, 000 people with a majority of people occupying Suva, Nadi and Lautoka. The Nadi and Sigatoka areas support the bulk of Fiji's tourism industry with a majority of the resorts and hotels being situated in this belt and a few dispersed throughout the vicinity of Rakiraki. All these eight sites are located along coastal areas.

### 3.0 Methodology

Information was obtained through site visits and direct observations of municipal markets, souvenir shops and jewellery shops of all the six towns and two cities. These procedures were further broken down into two parts.

1. In depth interviews with market vendors;
2. Assessing the number of turtle shells, sizes and derivatives sold in the market or shop.

### 3.1 In depth interviews

One to one in depth interviews were encouraged through informal discussions with the market vendors. The lead topics revolved around the main buyers or consumers; the rate of trading; the main suppliers; the costs of the product and the legal prospects in terms of their being aware of existing regulations such as the Turtle Moratorium. All discussions were documented using voice recorders. This minimises the disruption to their routine, saves a lot of time and records as much information as it can on site.



Turtle shell sold in a handicraft market  
© Merewalesi Laveti / WWF SPPO



## 3.2 Quantifying marine turtle shells and derivatives

A standardised data sheet has been consistently used throughout the three year survey period (Annex 1). The main factors sought when undertaking the market survey were:

- turtle carapace measurements (curved carapace length (min and max value), and curved carapace width);
- species identification;
- number of shells;
- number of derivatives, and
- trade value of shells and derivatives.

## 3.3 Species Identification

The differentiation between green and hawksbill turtles were made by observing for the distinctive greenish brown dark shaded scutes of the former while the latter has serrated scutes. The species identification card produced by SPC (Secretariat of the Pacific Communities) was used for species confirmation.



## 4.0 Results



Turtle shell being sold in Sigatoka town

### Part A: Shells and derivatives trade

The results of this survey clearly highlighted a significant decrease in the scale of the trade since the initial surveys of 2006 and 2007. There were no turtle shells recorded or found in all the visited 102 shops around Viti Levu (Table 1). In 2008, one of the shops surveyed in Sigatoka recorded jewellery derived from turtle shell (8 bangles and 2 pairs of earrings) being sold. However, in 2009 this same shop recorded none. Additionally, 10 bangles sold in a stall at the Nadi Municipal market in 2008 were priced at FJD 15 each. Monitoring of turtle shells and derivatives trade over the years have indicated that the trade value of items in the Nadi market were higher than those in Sigatoka. This is attributed to a higher concentration of tourists in Nadi as compared to Sigatoka.

The 2009 market surveys have indicated a significant change from the sale of turtle shells and derivatives since the early period of the survey in 2006. Interview results with vendors have indicated that monitoring at the International Port of entry is consistent and restricted. Many of the items sold to tourists are being confiscated, where these were then reported back to vendors.



| Location             | No. shops  | Hawksbill turtle |                             |  | Green turtle |       |
|----------------------|------------|------------------|-----------------------------|--|--------------|-------|
|                      |            | No. Shells       | Derivatives                 | Costs FJD                                | No.Shells    | Costs |
| Suva                 | 68         | 0                | 0                           |  | 0            | -     |
| Sigatoka-Coral Coast | 5          | 0                | 8 bangles, 2 pairs earrings | Bangles - \$10 each, Earrings - \$8 pair | 0            | -     |
| Nadi                 | 15         | 0                | 10 bangles                  | \$15.00 each                             | 0            | -     |
| Lautoka              | 10         | 0                | 0                           | 0  | 0            | -     |
| Ba                   | 1          | 0                | 0                           | 0  | 0            | -     |
| Tavua                | 1          | 0                | 0                           | 0  | 0            | -     |
| Rakiraki             | 1          | 0                | 0                           | 0  | 0            | -     |
| Korovou              | 1          | 0                | 0                           | 0  | 0            | -     |
| <b>Total</b>         | <b>102</b> |                  |                             | <b>\$246.00</b>                          |              |       |

Table 1: Number of Shells and Derivatives sold in markets in 2008

In relation to market vendors being aware of relevant regulations, the response from market vendors indicated that they were aware of the Turtle Moratorium in force and additionally of the declining turtle population. A vendor remarked, “*I used to sell turtle shells for the sake of decorating my stall but when I came to know of the animal being in critical condition, I believe we have so many other option to take rather than targeting this animal.*”



| Year     | Shells    |       | Derivatives |
|----------|-----------|-------|-------------|
|          | Hawksbill | Green |             |
| Dec 2006 | 18        | 18    | 259         |
| 2007     | 10        | 11    |             |
| 2008     | 0         | 0     | 20          |
| 2009     | 0         | 0     | 0           |

Table 2 shows the total number of shells and derivatives sold in municipal markets from 2006, 2007, 2008, 2009

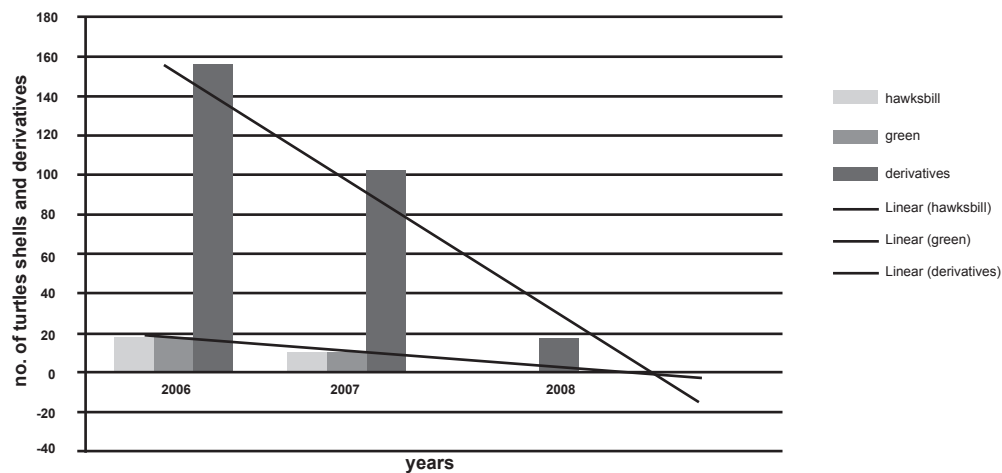


Figure 2: Graph showing the trend of trade of turtle's shells and derivatives from 2006 -2009

The shop vendor where the derivatives were found explained that these items have been on the shelves from previous years thus pointing to the sale of turtle shells and their derivatives being quite slow. In comparison with previous years, the targeted consumer group- tourists, have shown disinterest towards products derived from endangered species when perusing the markets. The same vendor shared that most of these tourists have provided feedback outlining how such items bought are being confiscated as they enter their destinations.



## Part B: Other endangered and protected species



Fig. 3: The triton shell (Davui) is another item that is regulated under CITES but is captured here being sold locally at handicraft markets.

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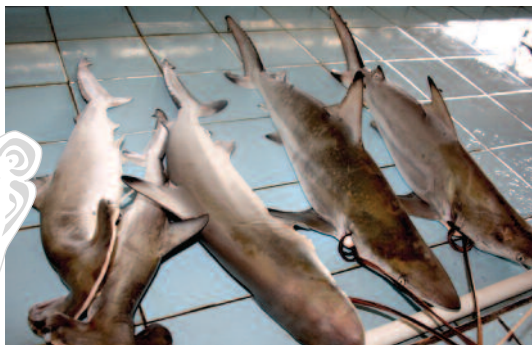


Fig. 4: Juvenile Hammerhead/Black tip Shark displayed for trade in one of the municipal markets in Fiji

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### 4.2.1. Value of juvenile sharks in municipal market

Other endangered species that were recorded as items for sale at markets included the triton shell (Fig. 3) which was priced at FJD 150.00. Additionally, five hammerhead and four black tip sharks (Fig. 4) were being sold for FJD 5.00 for two individuals.

An anonymous fisherman stated that these sharks are not targeted species but are incidental catch in their nets. He continued that his catches are bought by middlemen from Suva who sell them to restaurants for shark fin soup or as fresh fish for the public in markets around the Suva area.

Currently, the reef fish industry is thought to be a thriving one in Fiji based on the value of and demand for the fish in the markets. However, in most cases, fishes of special concern or endangered tends to be ignored by traders and swiped for its taste.



#### 4.2.2. Conservation status of pelagic sharks in the Pacific

A recent IUCN report on Sharks by Camhi et al., 2009 confirmed the conservation status of pelagic sharks including the above sighted sharks Hammerhead (*Sphyrna lewini*) and Black tip shark, (*Carcharhinus limbatus*) as threatened under IUCN red listing. The black tip shark is semi pelagic and usually found within the water column between the surface to 30 meters thus exposing them to greater chances of being caught in gillnets or being speared within inshore reefs. Hammerhead sharks are rated as one of the commercially important sharks in the world. They tend to be less oceanic as compared to other shark species but are found to be widely distributed in coastal and continental shelf waters in warm – temperate and tropical regions (Compango, 1984b). For this reason it is highly subjected to intensive domestic fisheries within EEZs, as well as the high seas.

Rose (1996) reasoned the trade value of hammerhead sharks fins for fin soup is due to its size and high needle count. It is also preferred for production of leather and liver oil in many Asian countries.

#### 4.2.3. Enforcement and monitoring

The public trading of juvenile sharks such as the hammerhead in Fiji has indicated the low level of awareness, advocacy and enforcement on size limits and priority to species of special concern or those that are undergoing threat to some extent. Likewise, it also dictates the thriving reef fish industry that is currently in place supported by demands from restaurants especially for shark fin soups.



Great hammerhead shark (*Sphyrna mokarran*)  
© naturepl.com/David Fleetham / WWF



## 5.0 Discussions



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Fig 6 & 7: Bangles sold and Handicraft centers visited  
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### 5.1 Scale of turtle shell and derivative trade dictates the level of awareness

The recent surveys have provided some insight as to the level of awareness on marine turtle conservation and enforcement in Fiji. From 2006 to 2009, the total of 57 turtle shells sold in the markets has decreased to none in 2009.

This significant decrease in the number of turtle shells and their derivatives being traded suggests that efforts over recent years by government and NGOs to raise awareness on the plight of marine turtles and relevant regulations, has had some impact. This shows that being able to positively influence decisions made by those at the latter end of the 'demand and supply' trading chain is an important point of intervention. It may lead to being able to further decrease the act of marine turtle exploitation in Fiji.

## 5.2 A trade shift from turtle shells and derivatives to wooden artifacts

The 2009 survey has clearly shown the disinterest of market vendors in trading turtle shells and derivatives in all the municipal markets of Viti Levu. Few vendors were interviewed stating that the interests of trade has been dissolved due to the increased trends of confiscation of items at the international ports of entry.

This does not limit vendors in promoting our cultural icon. As observed, many vendors have increased their production of wooden artifacts such as grog bowls, masks etc which depict turtle imagery. There is no significant price difference between these wooden artifacts and actual turtle shell derivatives thus not creating such a void for the vendors. Additionally, the popularity of turtles is also being seen on handprinted fabrics, materials, corporate logos and brand names.

Results from the increased awareness and advocacy activities throughout the country utilising avenues such as the media, can be seen in the form of the reduced trade in turtle shells and their derivatives.



Fig. 8: Wooden artifacts depicting turtles  
© Merewalesi Laveti / WWF SPPO



## RECOMMENDATIONS

### 6.1. Sea turtle management in Fiji

WWF SPPO is working closely with partners and government departments such as the Fiji Department of Fisheries via an established network known as the Fiji Sea Turtle Steering Committee (FSTSC) to improve awareness and advocacy on the conservation and protection of sea turtles and also the newly endorsed 10 year Turtle Moratorium (2009 – 2018). One of the objectives of the FSTSC is to increase outreach to rural and previously untapped urban areas. Over the period of the Moratorium, outreach will look to address rural and previously untapped urban areas. Additionally, the FSTSC recognises that a survey on turtle trade should extend to illegal or 'black' markets, while maintaining monitoring efforts at municipal markets. A vendor in Sigatoka reported that one of the main suppliers for turtle meat if ordered is settlements along the coastal areas in Suva such as the Tamavua I Wai settlement. He further explained that most bread winners are fishers that are trying to keep up with the instability of earning and making a living in urban centers.

This critical baseline information can thus be the basis for initiating strategic surveys in the future when targeting these

illegal / 'black' markets. A long term data set of trade in marine turtles can only provide to be useful when making informed decisions for the conservation / management of these endangered species.

### 6.2. Other species of special concern in Fiji

This report recommends that it is essential for Fiji to prioritize regulating pelagic shark fishing within our EEZ so as to help the population of this iconic species recover. Focuses should not only be limited to prohibiting shark finning but also to enforce size limits, by-catch and trade. It is also recommended that the demand for shark meat in commercial activities (eg. restaurants, importers etc) be gauged.

Importantly, the report recommends that Fiji continue to strengthen its relationships with regional bodies and neighboring countries particularly considering the migratory nature of these species.



## Conclusion

Through this body of work, it has been found that while the trade in marine turtle shells and their derivatives has significantly decreased over the last three years, the illegal trade in its meat is still quite prevalent.

This survey also reflects the rising levels of awareness from the general public with regards to the plight of the marine turtles. This can be drawn from the responses made by the interviewed market vendors around Viti Levu. This increased level of awareness can be attributed to the efforts of concerned Government departments and various NGOs –many of whom are members of the recently established FSTSC. However, it has also shown the minimal level of awareness on the protection or conservation of other species of special concern in Fiji, including pelagic sharks. This was clearly illustrated through the open display of hammerhead and black tip sharks available for sale at municipal markets.

This report again reiterates a strong recommendation for the enforcement of the 2009 - 2018 Turtle Moratorium. It also recognizes the need for increased financial assistance to be focused on initiating and continuing research to ascertain new information and monitor existing marine turtle population in Fiji.



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**WWF South Pacific Programme**

4 Ma'afu Street

Suva

Fiji Islands

Tel: (679) 331 5533

Fax: (679) 331 5410

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