Beyond the shell: exploring the dimensions of sea turtle take in Bocas del Toro, Panama

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Background

- Illegal take is one of the major threats that sea turtles face worldwide[1,2]
- In Bocas del Toro, Panama, the use of sea turtles has historically played an important role in the local economy and culture[3]
- During the 1960s, the region was one of the main exporters of tortoiseshell to supply national and international markets[4]
- Following the legal protection of these species in the early 2000s and ongoing conservation efforts, the population has shown signs of recovery.
- Today, Bocas del Toro is one of the most important nesting sites for hawksbill turtles in the Caribbean Basin[3, 5]
- Despite this progress, understanding the motivations behind the illegal take of sea turtles is essential for developing effective conservation and management strategies.

Aim

Assess the drivers of illegal sea turtle take in Bocas del Toro by evaluating community values, motivations, and opportunity contexts using the IPOACHED framework.

Methods

Data Collection and Analysis

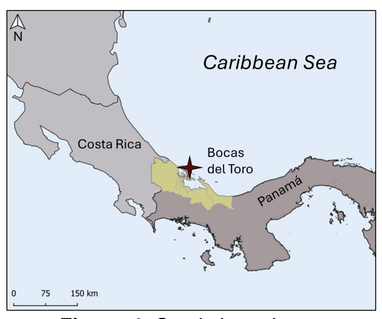
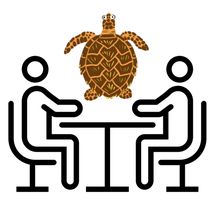


Figure 1. Study location

We conducted twenty-five semi-structure interviews in Bocas del Toro, Panama (Fig. 1):

- Playa Soropta
- Playa Drago
- Isla Colon
- Carenero

Step 01



May and June 2024

Step 02

Key-informants (e.g., members of native families) were selected by target and chain referral sampling[6,7]

Step 03

Interviews were used to understand how, why, and where illegal sea turtle take occurs in Bocas del Toro

Verbal consent was obtained and participation was voluntary[7]. Interviews were conducted in Spanish and later translate to English (IRB-24-0388)

Step 04

MAXQDA

Data was coded to apply the framework

IPOACHED FRAMEWORK[8]

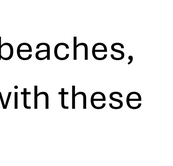
1. **Passive**
   - Easily immobilized or disable
   - Harmless
2. **In-demand**
   - Ecological and economic value
   - Symbolic or cultural value
3. **All-purpose**
   - Useable
   - Multi-purpose
4. **Obtainable**
   - Accessible
   - Abundant
5. **Hide-able**
   - Concealable
   - Disguisable
6. **Conflict-prone**
   - Ecologically or economically costly
   - Physiological or socially costly
7. **Extractable**
   - Removable
   - Unguarded
8. **Disposable**
   - High demand
   - Market proximity

Results

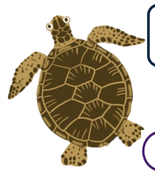
"People are not going to stop eating sea turtle meat… It is a tradition"
(Key informant n° 23, sea turtle seller) — **In-demand**

"It is easy to take turtles in the water because they float when they breathe"
(Key informant n° 10, NGO) — **Passive**

"Here they catch the green turtles that are going to Tortuguero"
(Key informant n°17, member of a native family) — **Obtainable**



"The most popular is the hawksbill because they sell the meat and the shell"
(Key informant n°1, people who benefit from tourism) — **All-purpose**



"You can find meat on the island all the time; you just need to call someone"
(Key informant n°13, local authorities) — **Hide-able**

"Most of the eggs taken in Soropta are taken to Changuinola to sell"
(Key informant n°6, member of a native family) — **Extractable**

"Before catching the animal, the turtle hunter has already sold the meat"
(Key informant n°8,consumer) — **Disposable**

Figure 2.Hawksbill turtle products found in the local market in Isla Colon, Bocas del Toro (Photos: DRC).

Key findings

- The high number of hawksbill and leatherback turtles on nesting beaches, along with the strong cultural ties people in Bocas del Toro have with these species, have made them recurrent targets.
- The take and trade of sea turtle products, such as meat, eggs, and oil, operate through established networks (Fig. 2, 3).
- Participants remarked that the ban on tortoiseshell trade negatively affected their economy and livelihoods, and many expressed confusion about why trade was no longer permitted, since they perceived sea turtles as abundant.

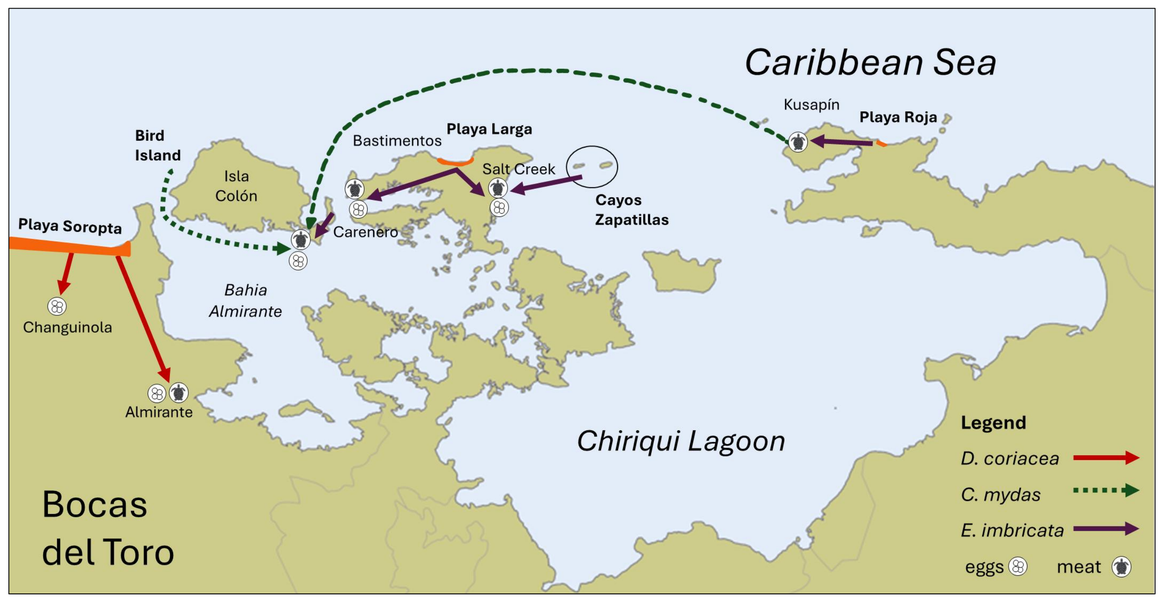


Figure 3. Map shows how the take and trade of sea turtles operates in Bocas del Toro, Panama

Take home message

- People in Bocas del Toro hold a strong cultural connection with the sea turtles, reflecting the historical importance of the species in the region.
- Illegal take of sea turtles continued to supply illicit markets of meat, eggs, tortoiseshell, and other products, indicating multiple uses and sustained economic demand.
- Our findings highlight the importance of integrating local knowledge with theoretically grounded frameworks to better identify current and emerging threats to sea turtles[8,9].
- This approach provides a replicable model for understanding how illegal take and trade operate and it helps underscore conservation gaps that must be addressed for more effective management.

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