



# Incidental capture of marine turtles by commercial fisheries in the waters of the Archipelago of Guadeloupe

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## Introduction :

In 1998, a marine turtle conservation project was established in Guadeloupe that sought to establish a recovery plan for these taxa in the French Antilles [1]. Three principal threats were identified in the region: incidental capture by fisheries, poaching, and habitat destruction. Of the three, incidental capture by fisheries is the biggest threat to marine turtles (Chevalier & al., sous press ; Delcroix, 2003). In Guadeloupe, fisheries are largely artisanal; that is, there are no organized commercial fleets of shrimpers, trawlers or drift netters. Rather, most fishing is done during the day by fishers using 6-8m boats fitted with outboard motors, employing a variety of techniques and gears (Figure 1). Given the lack of information on the impact of this type of fishery, a study was set up with the following objectives:

- ▶ Identify the gears and techniques being used by fishers ,
- ▶ Characterize the fishing effort,
- ▶ Estimate the frequency of incidental capture of marine turtles and the level of mortality associated with each type of fishing gear and technique,
- ▶ Estimate the overall impact of all fishing gear and techniques used throughout the archipelago.

## Materials and Methods :

This study was conducted throughout the archipelago of Guadeloupe (Figure 2). A recent overview of fisheries activities, including gears and techniques used, in Guadeloupe was conducted by IFREMER Martinique (Guillou & Langin, 1997). Using the information in this report, we set up interviews with local fishers in order to characterize and classify those types of fishing gears and techniques that involve incidental capture of sea turtles. Nearly 80 fishers were interviewed throughout the archipelago for details on incidental capture of marine turtles (e.g. the number of incidental captures per year, number of captures per haul-back, number of mortalities per year, etc.).

## Results and analyses

Throughout the archipelago, 14 different gears and techniques used by fishers were identified

**6 had little or no incidental capture of marine turtles :**

- ▶ Hook and line used in an artisanal fashion.
- ▶ Traps
- ▶ seines nets that do not occupy the entire water column

**3 caused incidental captures, but with little to no associated mortality:**

3 types of seines nets that occupy the entire water column for at least part of the time



Figure 3 : Seines being used in « Colas » *Ocyurus chrysurus* Guadeloupe. Port-Louis



Figure 5: Hawksbill captured in a bottom gillnet (Mazéas F.)

## Discussion and conclusion :

In >70% of observed stranded turtles in Guadeloupe (n=80), the cause of death has been linked to incidental capture by fisheries. Surveys for turtles on foraging grounds have shown that the abundance of turtles in areas where bottom fishing nets are used (large bottom plateaus at <50m depth) is significantly reduced relative to areas with little bottom fishing. These results suggest that incidental capture by fishers is a major threat to marine turtles in Guadeloupe.

Our surveys with fishers reinforce the potential role that some fisheries play in limiting the recovery of marine turtles in Guadeloupe. We estimate that total mortality due to incidental captures involves 500-1000 turtles per year. We suggest that shortening soak times in many of the problem fisheries would reduce the level of mortality for incidentally captured turtles. The three fisheries that have the most serious impact on marine turtle are gillnets targeting "Queen conch" and bottom trammel nets that target lobster and finfish. We suggest that alternatives be developed and tested that would minimize incidental capture of marine turtles, such as:

**For the lobster fishery:** reduce the height of the nets (Gobert, 1992) or use gear specific for lobster (e.g. pots).

**For the Queen conch fishery:** reduce the height of the nets ; set the nets horizontally.

**For the coastal finfish fishery :** avoid using trammel nets; use small long-line.

The economic decline associated with fisheries targeting pelagic species and using hook and line means that increasingly these fishers are setting more bottom nets in coastal areas, to make up for the loss. This may lead to an increased level of incidental captures of marine turtles in the near future. It is imperative that cooperative projects are undertaken across the Caribbean to deal with this growing problem.



Figure 1: Typical fishing boats used in Guadeloupe

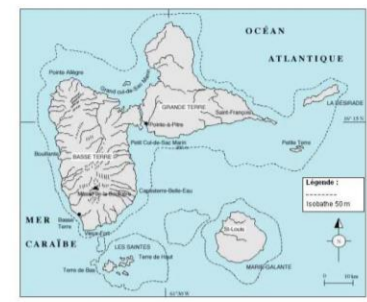


Figure 2 : Map of Guadeloupe

Table 1 : Data on incidental captures of marine turtles derived from interviews with fishers in Guadeloupe

|               | Seines (4) | Bottom gillnets (3) | Bottom trammel nets (2) | Traps (1) | Hook and Line (4) | Total |
|---------------|------------|---------------------|-------------------------|-----------|-------------------|-------|
| Direct data   | 34         | 38                  | 42                      | 39        | 72                | 225   |
| Indirect data | 10         | 9                   | 24                      | 0         | 5                 | 47    |
| Total         | 44         | 47                  | 66                      | 39        | 77                | 272   |

(n) = number of techniques and gears per class. Direct data = data derived from fishers who use the gear or technique in question. Indirect data = data derived from fishers who do not use the gear or technique in question.

Table 2 : Frequency of capture and mortality of marine turtles in bottom nets

| Problem fisheries by gear and/or technique           | Average annual rate of marine turtle capture                    | Mortality | Frequency of use | Impact of gear or technique on the recovery of marine turtles in Guadeloupe |
|--|---|-----------|------------------|---|
| <b>Bottom gillnets</b>                               | 1 - 3 turtles per net used throughout the year                  | >50%      | ++++             | Restricts recovery  |
| <b>Bottom trammel nets targeting « lobsters »</b>    | 1 - 2 turtles per net used during 2-3 months (seasonal)         | ≈100%     | +++              | Restricts recovery  |
| <b>Bottom gillnets targeting « sharks and rays »</b> | 1 - 3 turtles per net used 8-10 days per month                  | > 50%     | +                | undefined   |
| <b>Bottom trammel nets targeting « finfish »</b>     | 3 - 6 turtles per net used throughout the year                  | ≈ 50%     | ++               | Restricts recovery  |
| <b>Bottom gillnets targeting « Queen conch »</b>     | 1 - 3 turtles for 5-10 nets during 6 months (restricted season) | ≈100%     | ++               | Restricts recovery  |

Five gears resulted in many incidental captures with a relatively high rate of associated mortality. These are bottom nets (in waters <50m ; usually between 20 and 30m) fished from several hours to several days, despite regulations that limit each soak time to 5 hours maximum

**Bottom gillnets** target mainly finfish. These nets are 2m high and 200-3000m long, with a horizontal mesh size of 40-60mm. These nets are fished vertically for 3-5 hours. Smaller marine turtles (3-4kg) are most commonly captured by these nets.

**Gillnets targeting « rays and sharks »** is a net with large mesh size (100-200mm). They are 2-8m high and are never longer than 500m. These types of nets are fished vertically for a whole night and used throughout the year.

**Gillnets targeting « Queen conch »** is a large mesh net (100-150mm). Its height can vary from 1.2-4m and its length runs between 100-150m. This net can be fished either vertically or horizontally, usually over sea grass for several days. Since 2003, its use is restricted between the months of October and January. Incidental captures of marine turtles are far less frequent in horizontally fished net than vertically fished net.

**Bottom trammel nets for « finfish »** (Figure 4). This net is usually 4m high and 200-3000m long. It is usually fished vertically for 3-6 hours.

**Bottom trammel nets for « lobster »** (Figure 4). This net is usually 1.5m high and 200-3000m long. It can be fished vertically or horizontally for several days. Incidental captures of marine turtles are far less frequent in horizontally fished net than vertically fished net.

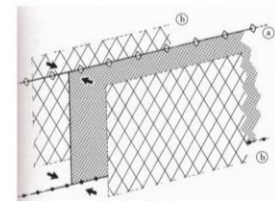


Figure 4 : Trammelnet setup

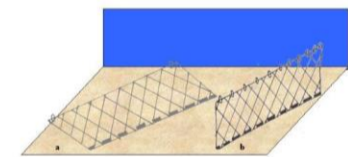


Figure 6 : Deployment of a net vertically (b) and horizontally (a)

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[1] Available at <http://www.tortuesmarinesguadeloupe.org>