



3. NAST-Net Protocol on studying interaction with fisheries (Bycatch Protocol)

Interaction with fisheries (bycatch) is one of the main threats facing sea turtle populations globally. Assessing interactions with fisheries and resulted mortality, reducing incidental catch to a minimum and eliminating deliberate capture are among the priority actions for the NAST-Net strategy. Limited data is available on the impact of bycatch on Seaturtle populations in the north Africa, with relatively good knowledge in both Tunisia and Morocco, compared to the rest of countries.

This protocol takes into account the existing protocols such as the MedPAN protocols and additional protocols used in Medbycatch project. It tries to summarise several data tables into cohesive number of datasheets designed for simpler but comprehensive data collection, to be used in standard manner among all NAST-Net member countries. The protocol defines, for each gear, the main parameters to be noted by qualified and trained on-board observers to enable the interaction and the ensuing mortality to be assessed.

The fishing gear considered are longlines, trawls and Set nets; these are the most concerned by interaction with turtles and cause most of the by-catch and mortality. The forms adopted in this protocol would be used during work on fishing boats, designed for each specific fishing gear, enabling understanding the impact of each gear on the sea turtle population in the study region to be assessed.

Onboard observers are observers working on a fishing boat as a technician (preferably a biologist by training), who works independently at gathering biological information on board fishing boats. The following responsibilities are established for observers on board fishing ships:

- Obtain reliable information on the interaction of marine turtles with fishing gear
- Obtain information on the fishing effort
- Record the interaction with other 'at risk' species (mammals, Elasmobranches and sea birds)
- Gather information on target species and discarded species



- Gather biological information on the species studied (size, sex, etc.)
- Take biological samples.

Once on board, observers must also gather information of a general kind, needed for correct interpretation of the results. This information concerns:

- Characteristics of the ship and fishing gear
- Specific composition of the catch
- Gather data on the boat's activity and the fishing operations
- Identify protected species, target species and species deemed to be by-caught
- Gather biological data (size, sex, sex ratio etc.) on the protected species and captured species.

The data collection mainly concerns:

- All incidental catch and interactions with protected species. Marine turtles have highest priority. Marine mammals, sea birds and elasmobranchs come second.
- Composition of catch
- Fishing grounds and features of the fishing gear
- Measurements of fishes and other species of zoological groups
- All the tags applied, observed or samples taken on the captured animals

Necessary parameters for assessing interaction with fishery activity

Average rate of catch of marine turtles (CPUE)

The average rate of catch of marine turtles is R .

R is estimated as follows: $R = T/FE$

Where

T is the number of turtles caught during the operations studied

FE is the fishing effort during the operations studied



It should be noted that the fishing effort and thus the rate of catch (CPUE) may vary from one region to the next and one season to another. No extrapolation is therefore allowed.

Total number of turtles caught

The total number of catches C is obtained by multiplying the rate of catch R by the total fishing effort H in a studied region.

$$C = H \times R$$

Getting a reliable estimate of the fishing effort in a region is extremely difficult. It can only happen if the fishermen accept: (i) to voluntarily record on their log books any catch of a marine turtle and to mention the fishing effort made, or (ii) to agree to observers on board their ships for each sea trip.

Mortality rate calculation

The rate of direct mortality p is the proportion of turtles found dead during fishing operations, when the catch is brought on deck. This proportion is estimated from the number of the total catch.

$$\text{Total mortality is } TM = C \times p = H \times R \times p$$

where C is the total number of catches

p is the proportion of turtles found dead

H is the total fishing effort in a studied region.

R is the rate of catch



NAST-Net Protocol/On board observation form

Longline form

Observer Name : **Ship : N°** Name Length Power..... Name of the owner.....

Trip N°...../ **Departure** : Date : Hour Port of departure **End** : Date : Hour
Arrival port.....

Fishing gear/ Characteristics and techniques

Type : Bottom longline Number of floats
Surface longline Number of weights

Hook: J Number between two weights/floats
Circular Size Total number.....

Signal buoy
Flag Luminous
Number Color

Fishing technic

Depth (m) **Target species**..... **Baits** **Mainline:** Length (km) Diameter (mm)..... **Branchline :** Length (m).....
Diameter (mm).....

Fishing operation (Dropping/Drawing) (N°.....)

	Dropping						Drawing					
	Date/hour	Longitude	Latitude	State of the sea*	Wind/Dir*	Wind/Force*	Date/hour	Longitude	Latitude	State of the sea	Wind/Dir	Wind/Force
Start												
End												

Captures

N°	Species name	N° of float	N° of mooring	N° of hook	Physical state*	Animal Kept/rejected	Sex	Measures		Tag	Sample	Photo	Comment
								TL	ST				
1													



2													
3													
4													
5													
6													
7													

TL: Total length; ST: Standard Length

Total catch	Target species	Species retained	Rejected	Turtles	Comment
Number					
weight					

State of sea

- Calm
- Rippled
- Choppy
- Rough

Wind direction

01 North	02 North/East
03 South/East	04 East
05 South	06 South/West
07 west	08 North/West

Wind force

01 Calm
02 Light breeze
03 breeze
04 Fresh breeze

Physical state

01 Alive
02 Dead
03 In coma
04 Injured
05 unknown

Captures of marine turtles

Species (Tick)		Comment
<i>Caretta caretta</i>	
<i>Chelonia mydas</i>	
<i>Dermochelys coriacea</i>	



	UN-IDENTIFIED		
Measures (cm)	SCCL (Standard Curved Carapace length)		Comment	
	CCW (Curved Carapace Width)			
	TL (Length of the tail)			
Catch (Tick)	By hook		Comment	
	By strangling			
	Gear removed (yes/no)			
	Tag exist (yes/no), if yes N°			
Release	Date/hour		Comment	
	Longitude			
	Latitude			



	Physical state	
	Tagged (yes/no), if yes N°		



Trawl Form

Observer Name : **Ship : N°** **Name** **Length**
Power

Trip N°/ **Departure** : Date : Hour **Port of departure** **End** : Date : Hour
 **Arrival port**

Fishing gear/ Fishing technique

Trawl type : Bottom <input type="checkbox"/> Mid-water <input type="checkbox"/>	Fishing technique : Depth (m) Target species :	Trawl : Length of headrope (m) Mesh size (mm) : Trawl Body Codend	Fishing operation : Warp length (m) Sweeps length (m) : Speed of ship (knots/h) :
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Fishing operation (Dropping/drawing) (number.....)

	Dropping						Drawing					
	Date/hour	Longitude	Latitude	State of sea*	Wind/Dir*	Wind/Force*	Date/hour	Longitude	Latitude	State of sea	Wind/Dir	Wind/Force
Start												
End												

Catch

N°	Name of species	Number of crates or parts	Approx. Weight	Physical state*	Animal Kept/rejected	Sex	Measurement		Tag (Yes/No)	Sample (Yes/No)	Photo (Yes/No)	Comment
							LT	LF				



1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

Total catch	Target species	Retained species	Rejected	Turtles	Comment
Number					
Weight					

State of sea

- Calm
- Rippled
- Choppy
- Rough
- Very rough

Direction du vent

01 North	02 North/East
03 South/East	04 East
05 South	06 South/west
07 West	08 North/West

Force du vent

- 01 Calm
- 02 Light breeze
- 03 Breezy
- 04 Fresh breeze
- 05 Strong breeze

Etat physique

- V** Alive
- M** Dead
- C** Comatose
- B** Injured
- ID** Indetermined



Marine turtle catch

Species (Tick)	<i>Caretta caretta</i>		Comment	
		<i>Chelonia mydas</i>	
		<i>Dermochelys coriacea</i>	
		Undetermined	



		
Measurements (cm)	SCCL (Standard Curved Carapace length)		Comment
	CCW (Curved Carapace Width)		
	TL (Tail Length)		
Catch (Tick)	In the codend		Comment
	Hanging on the net		
	Other location		
	Existing tag (Yes/No), If Yes N°		
Release	Date/hour		Comment



Set Net Form

Page # _____ of _____ pages NAME OF OBSERVER _____

Trip N°: Operation N°:

Set Net	Mesh size (mm)			Net Length (m)	Net width (m)	Net Location – location name
Gill net						
Trammel net	Int		Ext			
Other net						

	Date	Hour	Depth (m)	Temp. (C°)	Visibility (km)	GPS Latitude	GPS Longitude
Set Start							
Set End							
Pull Start							
Pull End							

Catch Record

Catch ID:	Species	Target	Retained Commercial	Discard Bycatch	Length ¹ (cm)	Depredation (y/n)	Sex ¹	Comments
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

¹Record Length and sex for vulnerable and rare species

	Retained Target	Retained Commercial	Discard Other	Marine turtle bycaught
TOTAL COUNTS (n)				

	Retained Target	Retained Commercial	Discard Other	Bycatch



WEIGHT TOTALS (Kg)				
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