Best handling and release practice guidelines for sea turtles

Rapid Fishery Characterization

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Segundo Taller Anzuelos Circulares / 2nd Circle Hook Workshop

28-30 abril 2025 / 28-30 April 2025

Contents lists available at SciVerse ScienceDirect

Biological Conservation

journal homepage: www.elsevier.com/locate/biocon

Circle hooks: Developing better fishing practices in the artisanal longline fisheries of the Eastern Pacific Ocean

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ARTICLE INFO

Article history:
Received 9 May 2012
Received in revised form 23 January 2013
Accepted 27 January 2013

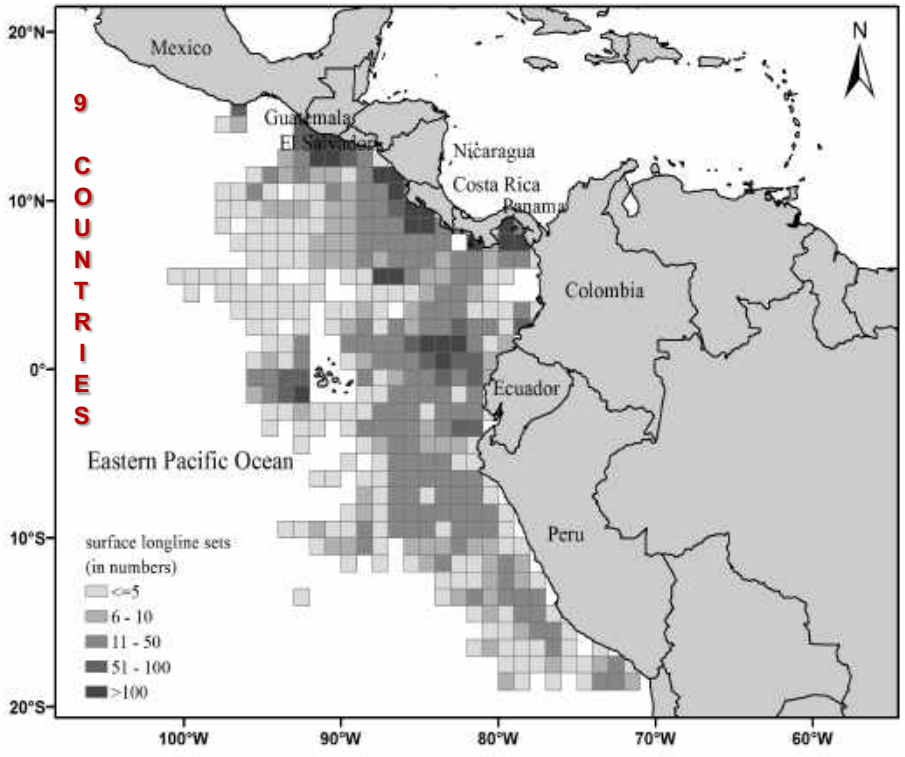
Keywords:
Bycatch mitigation
Circle hooks
Surface longline fisheries
Sea turtles

ABSTRACT

Since 2004, governments and non-governmental organizations, together with the fishing communities from nine countries, from Mexico to Peru, have implemented joint efforts to reduce incidental mortality of sea turtles in artisanal longline fisheries of the Eastern Pacific Ocean (EPO). These countries are involved in a Regional Sea Turtle Bycatch Program to achieve this goal. Circle hooks have been proposed as a way to mitigate incidental mortality of sea turtles. Thus, we analyze the performance of circle hooks in relation to J-style and tuna hooks on the hooking rates of target and non-target species in the artisanal surface longline fisheries of three of the participating countries with the largest sample sizes (Ecuador, Panama and Costa Rica). These fisheries target mahi-mahi, *Coryphaena hippurus*, or a combination of tunas, billfishes and sharks (TBS), and use different techniques and gear configurations to catch their targets. For the TBS fishery we presented the results of comparisons between tuna hooks and 16/0 circle hooks from Ecuador, Panama and Costa Rica, and between tuna hooks and 18/0 circle hooks in Costa Rica. For the mahi-mahi fishery, we analyzed the performance of 14/0 and 15/0 circle hooks in Ecuadorian vessels and 16/0 circle hooks in Costa Rican vessels vs. the traditional J-style hooks. A total of 730,362 hooks were observed in 3126 sets. Hooking rates for target and non-target species were not consistent for all fisheries and countries analyzed. However, circle hooks reduced sea turtle hooking rates in most of the comparisons.

Experimental Observed Fishing Effort (2004-2012)

Number of trips	Number of sets	Number vessels	Number hooks J	Number hooks Circle
2564	11351	650	1 187 982	3 215 589



Marine turtles hooking rates

Tasas de enganche de tortugas marinas

Surface	Comparison	Costa Rica	Panama	Ecuador	Perú
TBS	J-C16	=	50%*	50%*	12%
	J-C18	75%*			
MAHI MAHI	J-C16	25%*			
	J-C15			=	65%*
	J-C14			45%*	40%
	C15-C14		=	=	
	C15-C13		=		

Target species hooking rates

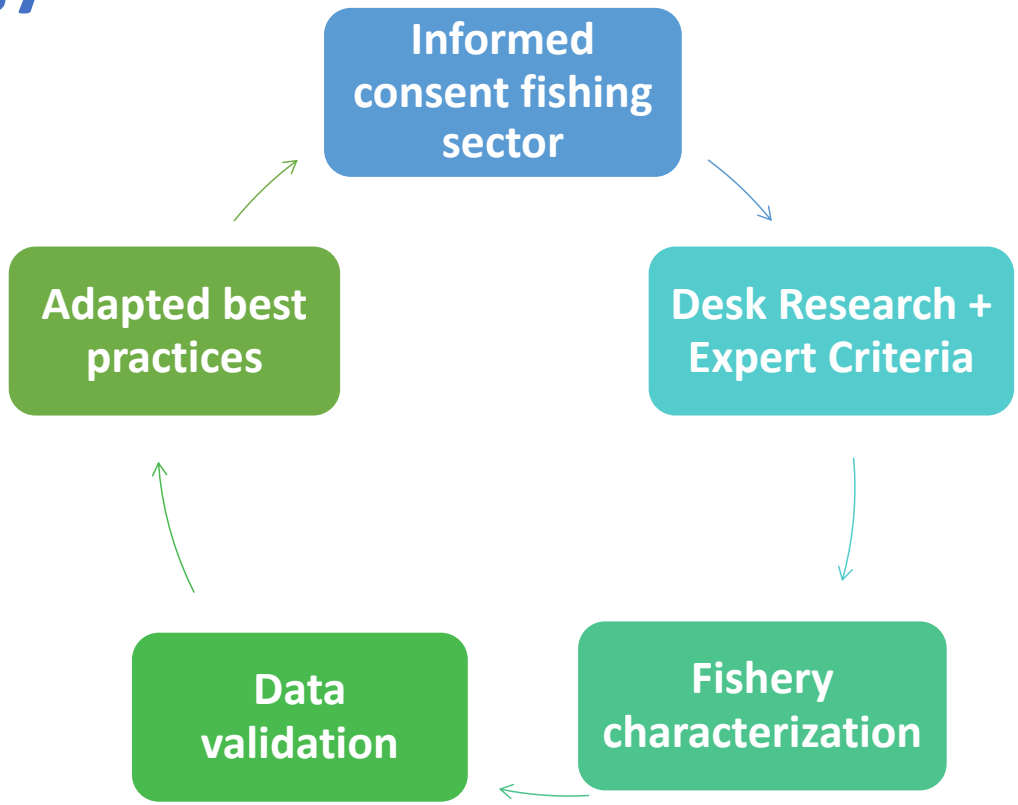
Tasas de enganche de especies objetivo

Surface	Comparison	Costa Rica	Panama	Ecuador	Perú
TBS	J-C16	10%*	=	20%*	=
	J-C18	50%*			
MAHI MAHI	J-C16	=			
	J-C15			40%*	50%*
	J-C14			30%*	50%*
	C15-C14		=	=	
	C15-C13				

Update information on fishing characteristics to understand the potential interaction of fisheries with sea turtles (rapid assessment):

- Understand key characteristics of commercial fleets with potential interaction with sea turtles (vessels, fishing gears, operations).
- Understand fisher behavior onboard.
- Identify critical information gaps to propose best handling and release practices, including tools, for the development of a targeted training curricula.
- Identify key elements to be systematically monitored for effective bycatch management.
- Contribute to sustainable fishery management and conservation outcomes.

Methodology



Port selection

Costa Rica

Panama

Ecuador

31 fishing communities and ports sampled (14 in Costa Rica; 11 in Panama; 6 in Ecuador)

139 vessels (61 vessels in Costa Rica; 63 in Panamá; 15 in Ecuador)

Description and characteristics of the medium and advanced scale fishing fleet

- Length
  - Mediana →7,99 - 15,45 m
  - Avanzada → 10,65 - 23,71 m

Description and characteristics of the medium and advanced scale fishing fleet

- Work area

Description and characteristics of the medium and advanced scale fishing fleet

Description and characteristics of the artisanal and industrial fishing fleet

Altura y bajura

Artisanal and industrial fleet

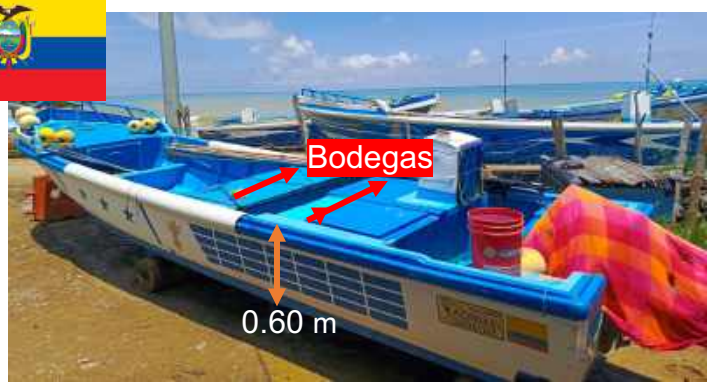
Description and characteristics of the artisanal and industrial fishing fleet

- Work area

Description and characteristics of the artisanal and industrial fishing fleet

Description and characteristics of the artisanal and industrial (nodrizas) fishing fleet

Length: 8.0- 10.50 m

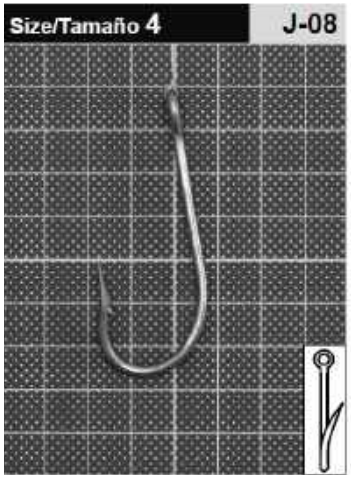


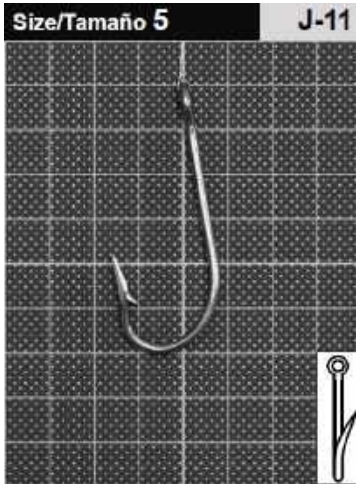
Length: 13.5-25 m

Description and characteristics of the artisanal and industrial (nodrizas) fishing fleet

TBS

Dorado





Why is it important to adapt best practices to characteristics of fleet?

Main recommended practice: To cut the line as short as possible

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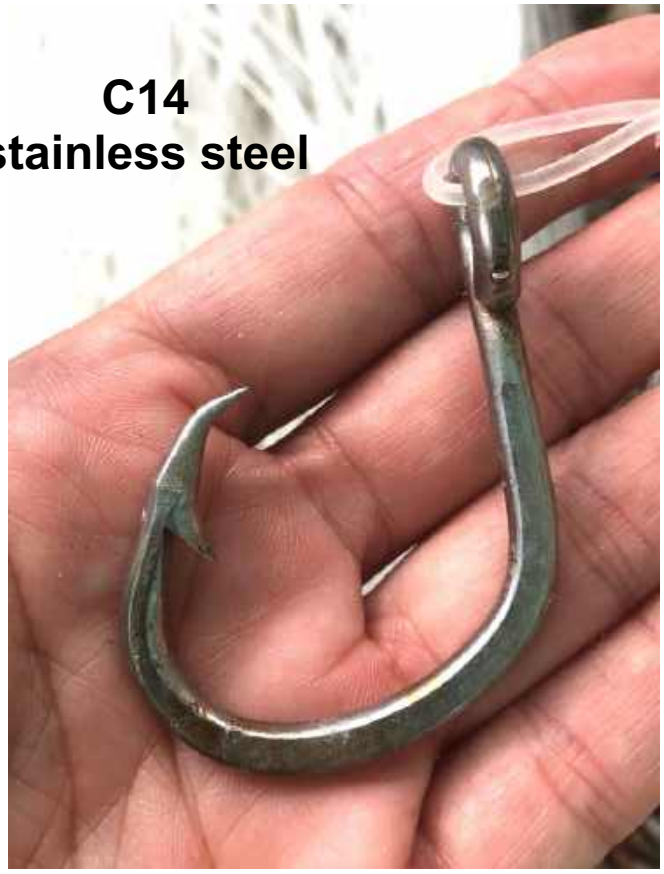
Size and materials of hooks



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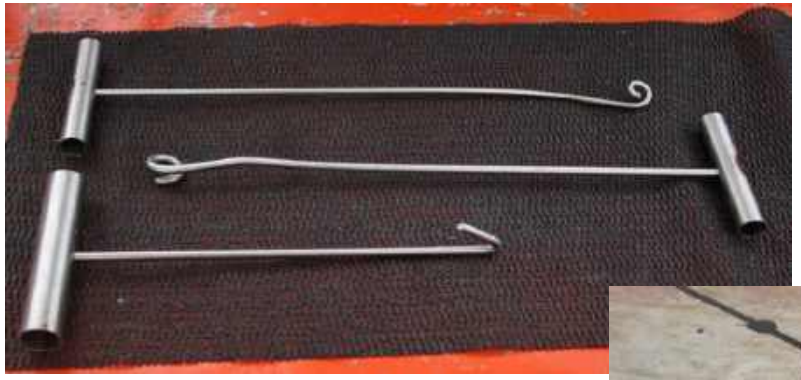

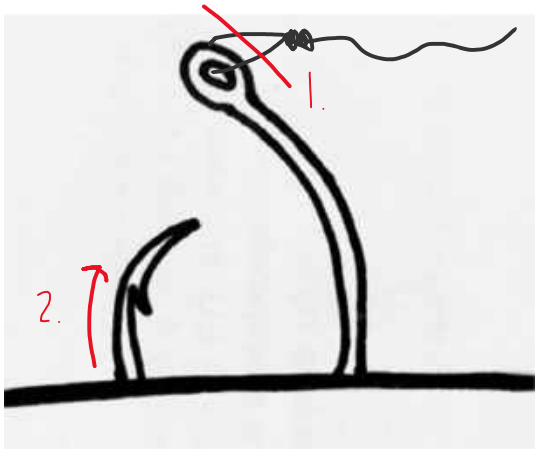

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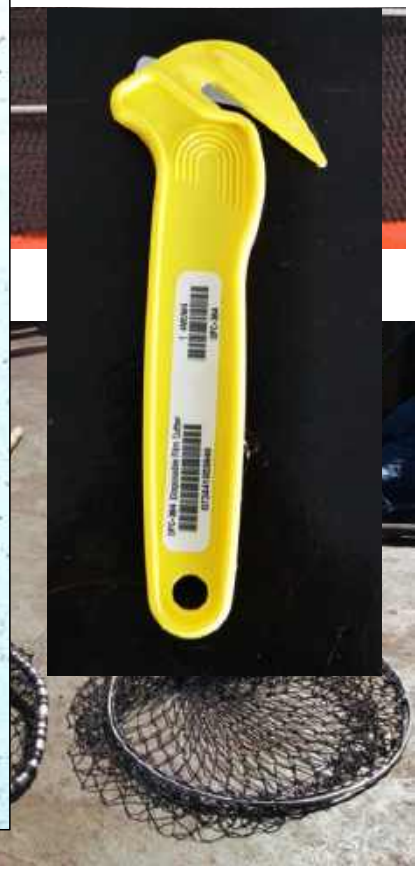

Conclusions

- The “one-size-fits-all” does not work - It is essential to have a good understanding of the fisheries (characteristics, conditions, operation, particularities) to define tailored best practices taking into account the traditional knowledge of fishermen.
- Best practices must be reviewed and adapted periodically due to the fisheries are very dynamic.
- Winning combination entails achieving voluntary compromises of the fishing and commercial sectors, together with regulations – recognition of fishers.
- Circle hooks and other technological modifications are not a substitute for fisheries management

Acknowledgements

Manuel Parrales, Ecuador
Liliana Rendón, Ecuador/Latinoamérica
Lucas Pacheco, Panamá/ Latinoamérica
Álvaro Segura (†), Costa Rica
Maite Pons, University of Washington, USA

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