

Best Practices to Reduce Mobulid Ray Bycatch

A Literature Review for Global Tuna Fisheries



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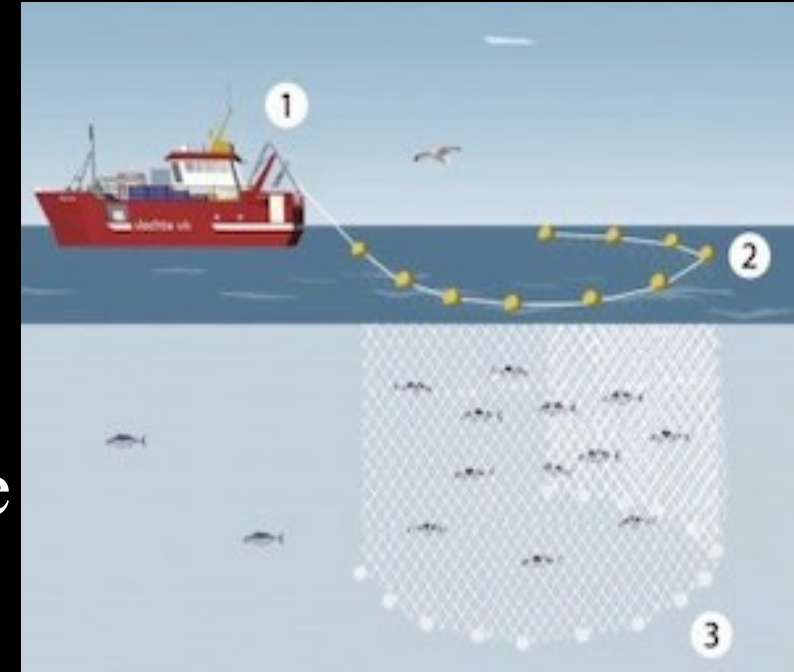
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Mobulid rays and tuna fisheries

- Manta and devil rays (*Mobula spp.*) are highly vulnerable
- Low fecundity and growth rates, few offspring
- 13,000 mobulids caught annually in tuna purse seine fisheries (Croll et. al, 2016)



SPECIES	<i>M. birostris</i>	<i>M. alfredi</i>	<i>M. tarapacana</i>	<i>M. mobular</i>	<i>M. thurstoni</i>	<i>M. munkiana</i>	<i>M. hypostoma</i>	<i>M. rochebrunei</i>	<i>M. kuhlii</i>	<i>M. eregoodootenkee</i>
IUCN Listing	VULNERABLE (VU)	VULNERABLE (VU)	ENDANGERED (EM)	ENDANGERED (EN)	ENDANGERED (EM)	VULNERABLE (VU)	ENDANGERED (EM)	ENDANGERED (EM)	DATA DEFICIENT (DD)	NEAR THREATENED (NT)

What are the best ways to reduce mobulid bycatch?

- Literature review of existing bycatch mitigation interventions for mobulids
- Sources: peer-reviewed studies, tuna fishery reports, handling guidelines
- Identify mitigation options with greatest impact on *BPUE* (bycatch rate)

	A	B	C	D		E	F	G	H	I
1	year	1st author's last name	article title	type of paper (white, PR, etc.)		ocean region/ countries	gear types: PS,LL,GN,TW	SSF or LSF	(T)RFMOs	Target Catch/ Fisheries
J	K	L		M	N	O	P	Q	R	
CPUE/ bycatch data	mortality rates	handling/ mitigation efforts		species	questions addressed	Time Period of Data Collection	results summary	keywords/ search words	final notes/ takeaway	

Bycatch Reduction Options

Post-Capture

Pre-Capture

Gear Modifications

Handling Modifications

Spatial

Temporal

FAD Designs

Net Modifications

Brailer Mods.

Workshops

MPAs

Night vs. Day

Seasonal Closures

Results to guide bycatch mitigation techniques during tuna skipper workshops



INDIVIDUS DE GRANDE TAILLE

BONNES PRATIQUES

LIBÉREZ L'ANIMAL À L'AIDE DE LA SALABARDE.

REMETTEZ-LE À L'EAU EN UTILISANT UN MORCEAU DE FILET OU UN MORCEAU DE TOILE EN PLASTIQUE SOULÉVÉ PAR UNE GRUE.

A ÉVITER

N'INSÉREZ PAS DE CÂBLE DANS LE CORPS DE L'ANIMAL ET N'UTILISEZ PAS DE CÂBLE POUR LE LOGOTER DANS LE BUT DE LE REMORQUER OU DE LE SOULEVER.

AVANT CHAQUE COUP DE PÊCHE, L'ÉQUIPAGE DOIT PRÉPARER UN MORCEAU DE FILET (OU UN MORCEAU DE TOILE) SUR LE PONT POUR ÊTRE PRÊT À LIBÉRER DES ANIMAUX DE GRANDE TAILLE.

An infographic titled 'INDIVIDUS DE GRANDE TAILLE' (Large Individuals). It is divided into two main sections: 'BONNES PRATIQUES' (Good Practices) and 'A ÉVITER' (To Avoid). The 'BONNES PRATIQUES' section shows a sequence of steps: 1. A fish is caught in a net. 2. The fish is lifted out of the net using a 'salabarde' (a traditional lifting device). 3. The fish is held in a net. 4. The fish is lowered into the water using a crane that lifts a piece of plastic or netting. The 'A ÉVITER' section shows two incorrect methods: 1. A cable is inserted into the body of the animal. 2. A cable is used to hoist the animal by its body. Below the infographic are several logos, including the European Union flag and other organizational logos.

Thank you!

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