

Deepwater fish and fisheries in the MesoAmerican Region

Peces y pesquerías de aguas profundas en la Región Mesoamericana

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Objetivos y agenda

1. Describir la historia y el estado contemporáneo de la pesca en aguas profundas
 - Encuestas de pesca
 - Diferencias en la pesca entre países
 2. Investigar los peces en la pesca de aguas profundas
 - ¿Dónde, cuantos, cómo?
 - Areas y tiempos importantes
- ¿Se necesita manejo/conservación?
 - ¿Cómo es esto para los pescadores?
 - ¿Cuál es el futuro de la pesca?
 - ¿Cómo podemos asegurar la sostenibilidad?
 - Resiliencia al cambio climático

¿Por qué peces de aguas profundas?

- ¿Pesca sostenible?
 - Las generaciones futuras pescarán el mismo número y tamaño de peces
- Longevo
- Tarde para reproducirse
- Crecimiento lento

Science News

from research organizations

Deep-sea fish in deep trouble: Scientists find nearly all deep-sea fisheries unsustainable

Date: September 9, 2011

Source: Marine Conservation Biology Institute

Summary: A team of leading marine scientists from around the world is recommending an end to most commercial fishing in the deep sea. Instead, they recommend fishing in more productive waters nearer to consumers.

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FULL STORY

A team of leading marine scientists from around the world is recommending an end to most commercial fishing in the deep sea, Earth's largest ecosystem. Instead, they recommend fishing in more productive waters nearer to consumers.

In a comprehensive analysis published online in the journal *Marine Policy*, marine ecologists, fisheries biologists, economists, mathematicians and international policy experts show that, with rare exceptions, deep-sea fisheries are unsustainable. The "Sustainability of deep-sea fisheries" study, funded mainly by the Lenfest Ocean Program, comes just before the UN decides whether to continue allowing deep-sea fishing in international waters, which the UN calls "high seas."

Life is mostly sparse in the oceans' cold depths, far from the sunlight that fuels photosynthesis. Food is scarce and life processes happen at a slower pace than near the sea surface. Some deep-sea fishes live more than a century; some deep-sea corals can live more than 4,000 years. When bottom trawlers rip life from the depths, animals adapted to life in deep-sea time can't repopulate on human time scales. Powerful fishing technologies are overwhelming them.

"The deep sea is the world's worst place to catch fish" says marine

¿Por qué estudiar peces de aguas profundas?

Black grouper/mero negro



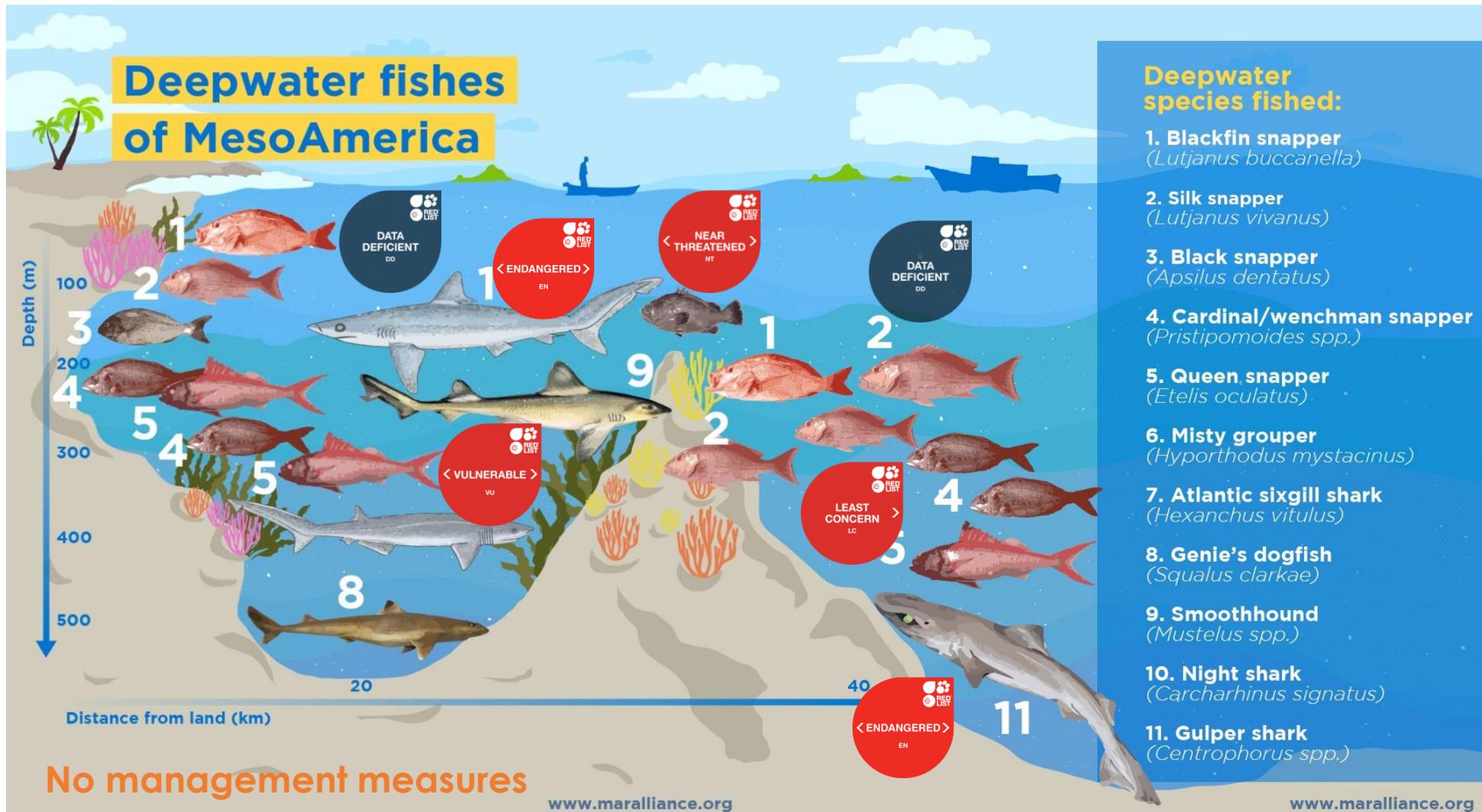
Live for 30 years

Yellowedge grouper/
mero de
aletas
amarillas

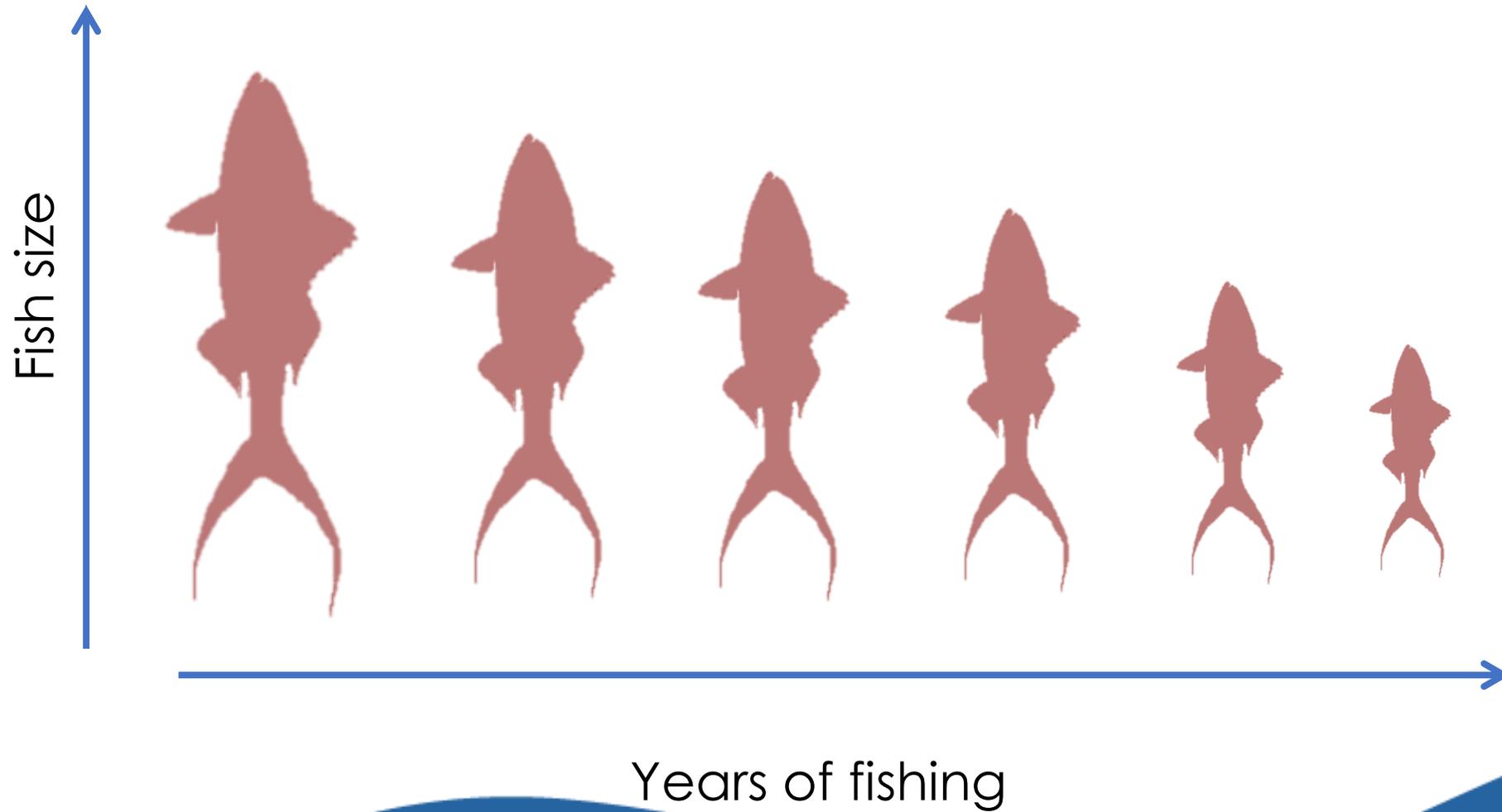


Live for 80+ years

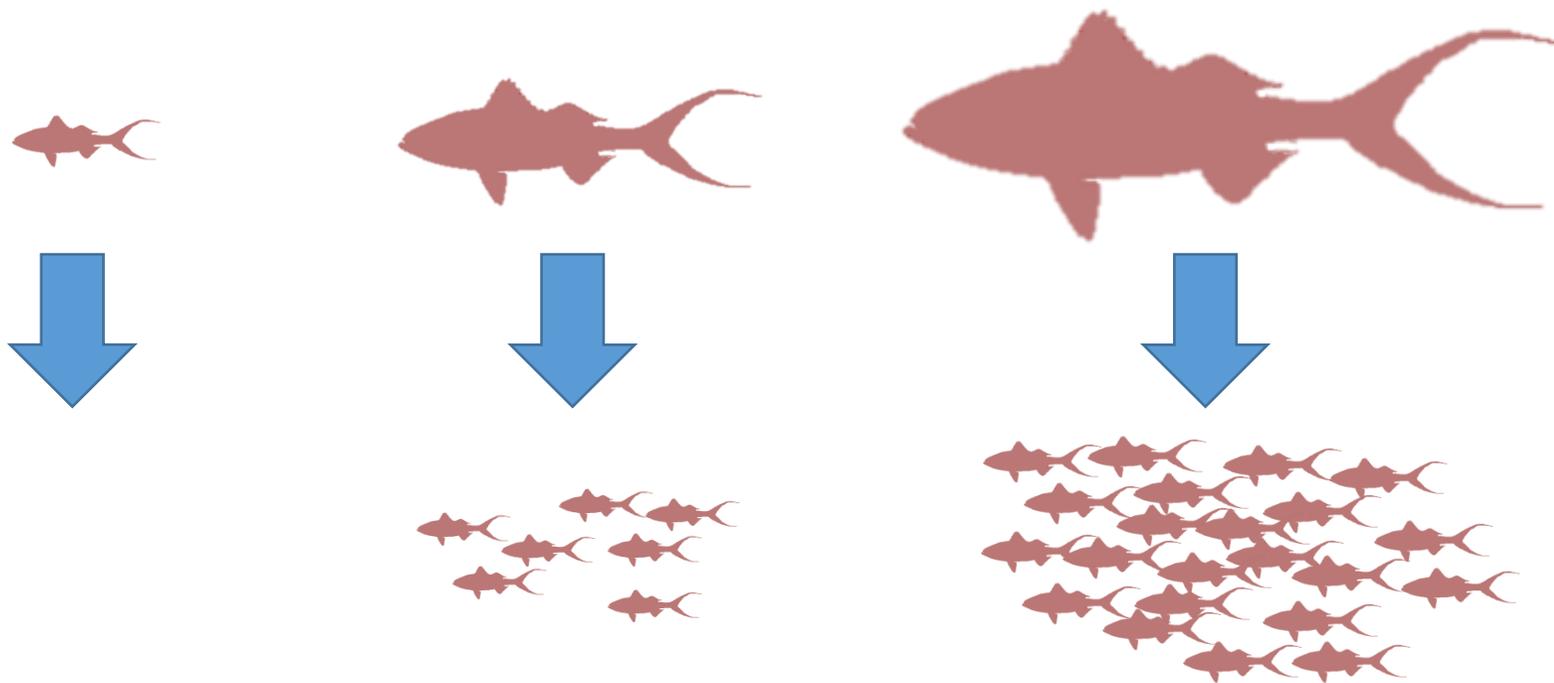
¿Por qué estudiar peces de aguas profundas?



¿Cómo es la sobrepesca?

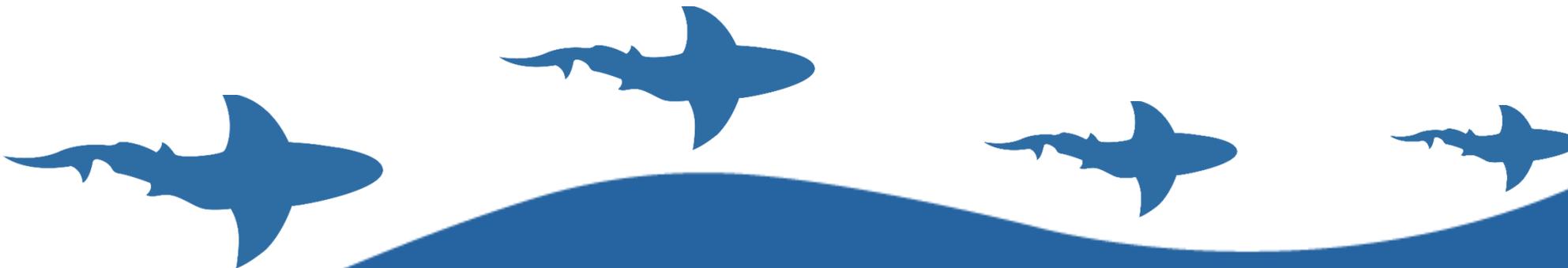


¿Por qué importa el tamaño?



¿Por qué importa el tamaño?

- Peces más longevos
 - Tardan más en reproducirse
 - No te recuperes de la sobrepesca
- Sobrepesca = menos peces y más pequeños
 - Más esfuerzo para pescar menos peces
 - Viajes más largos, más combustible, menos ganancias
 - La pesca no es una buena ocupación para las generaciones futuras





PROJECT BRIEF

Characteristics of the deepwater fishery of MesoAmerica

IN MEXICO, BELIZE, GUATEMALA, AND HONDURAS

Photo: Samuel RD Owen

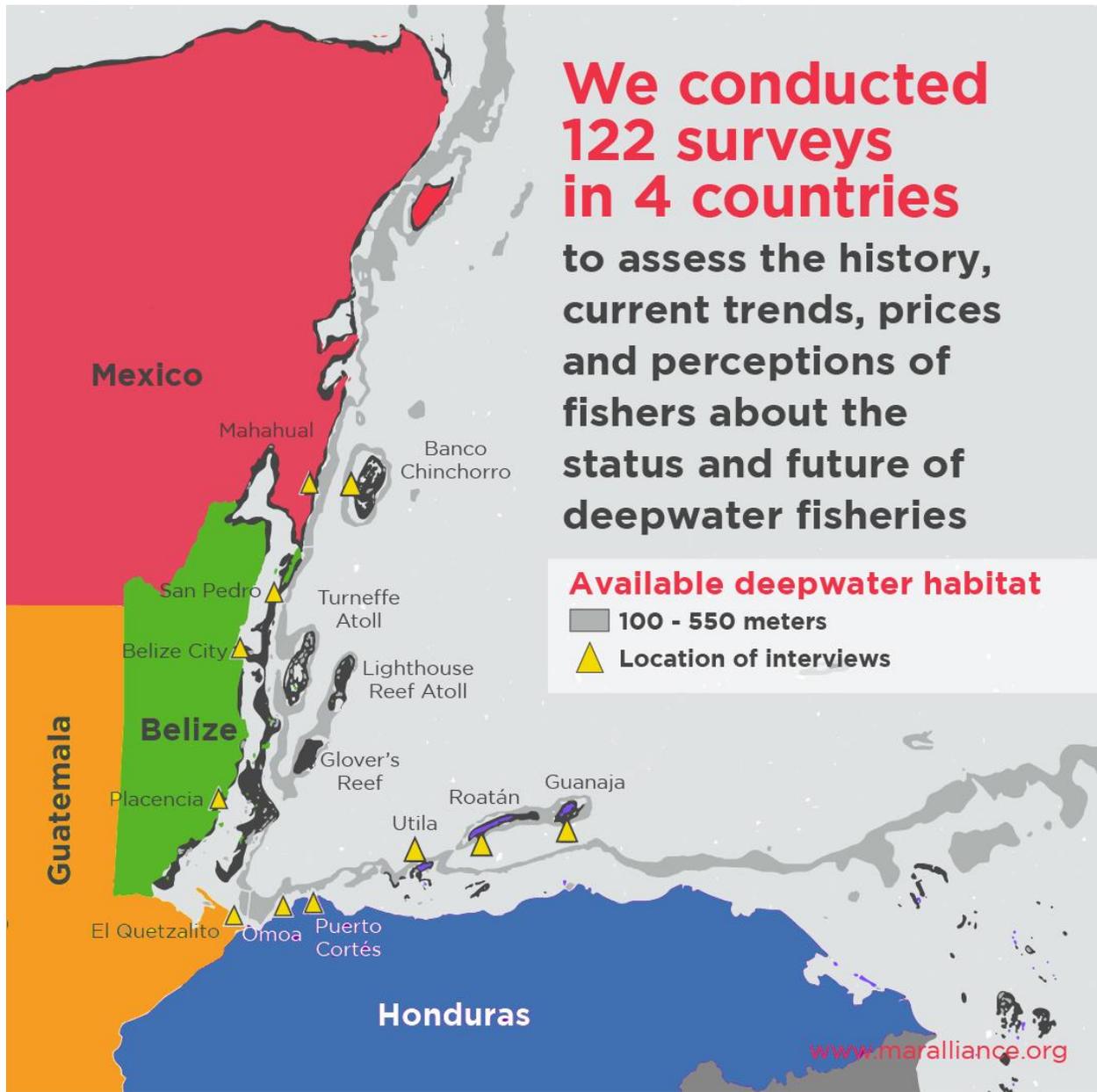


We conducted 122 surveys in 4 countries

to assess the history, current trends, prices and perceptions of fishers about the status and future of deepwater fisheries

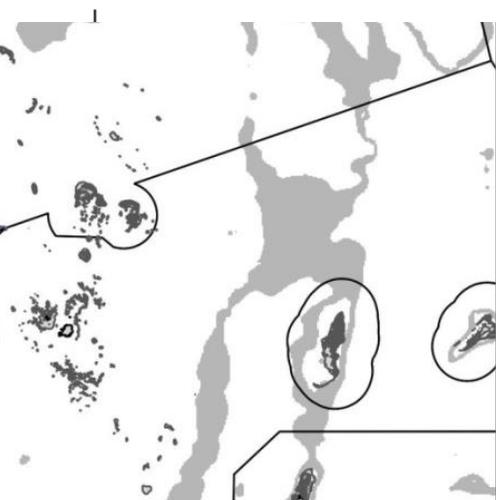
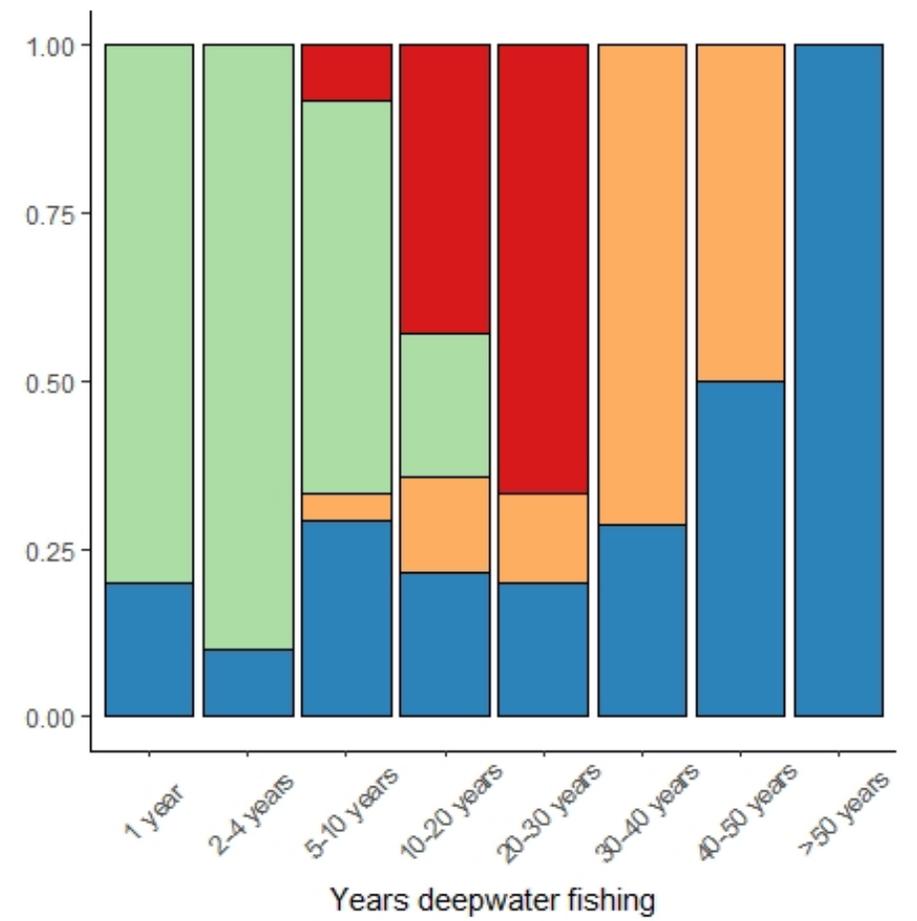
Available deepwater habitat

- 100 - 550 meters
- Location of interviews

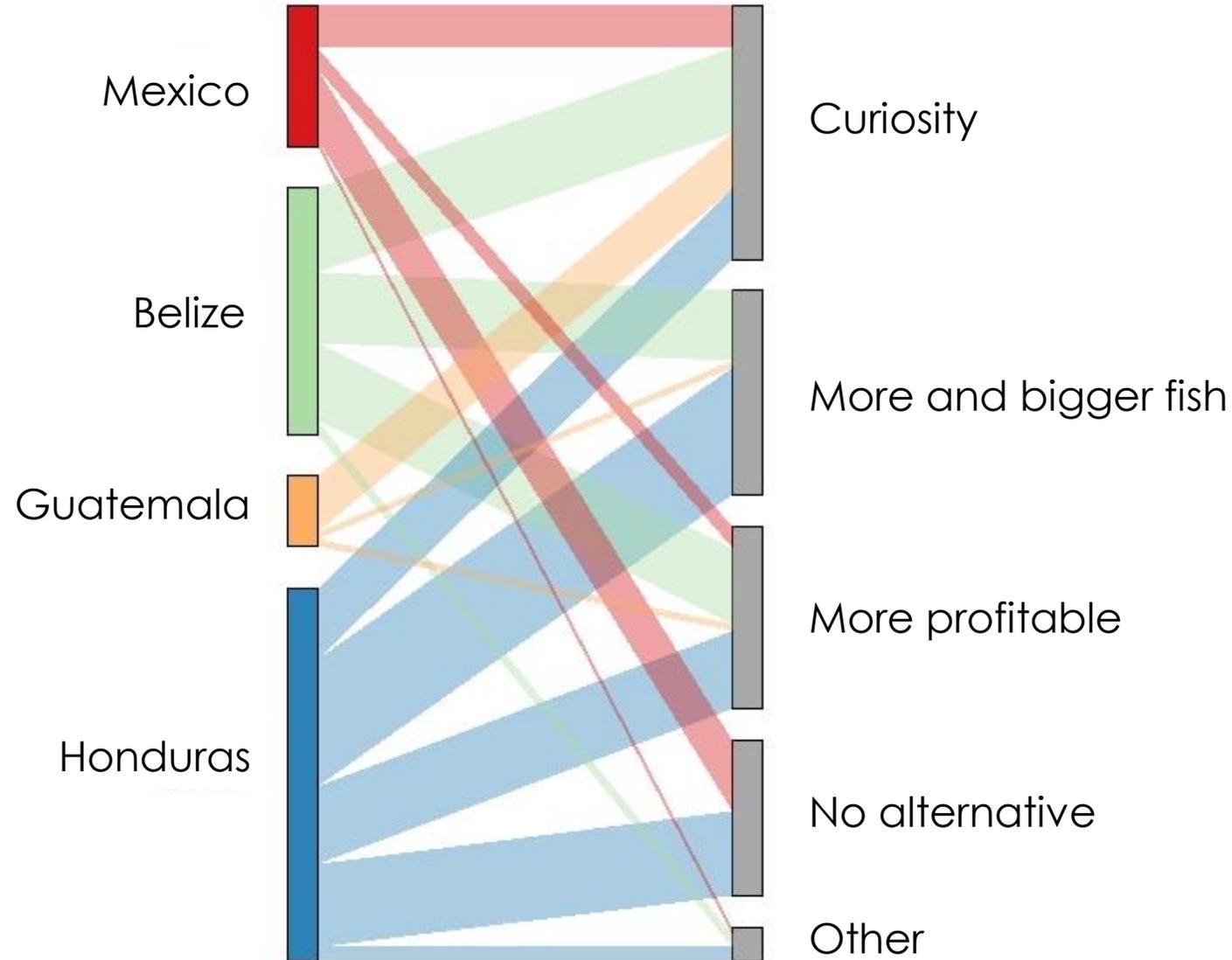


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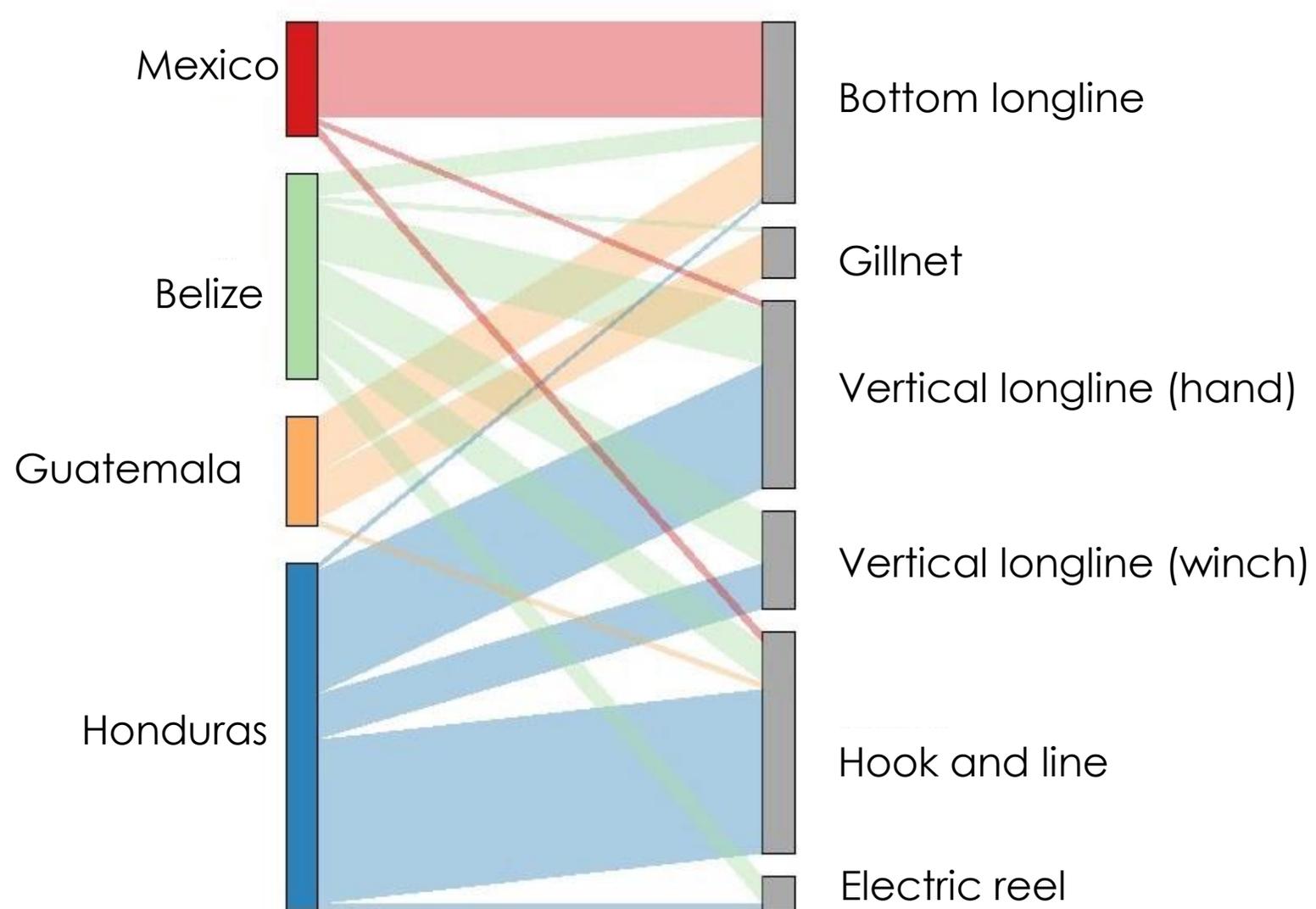




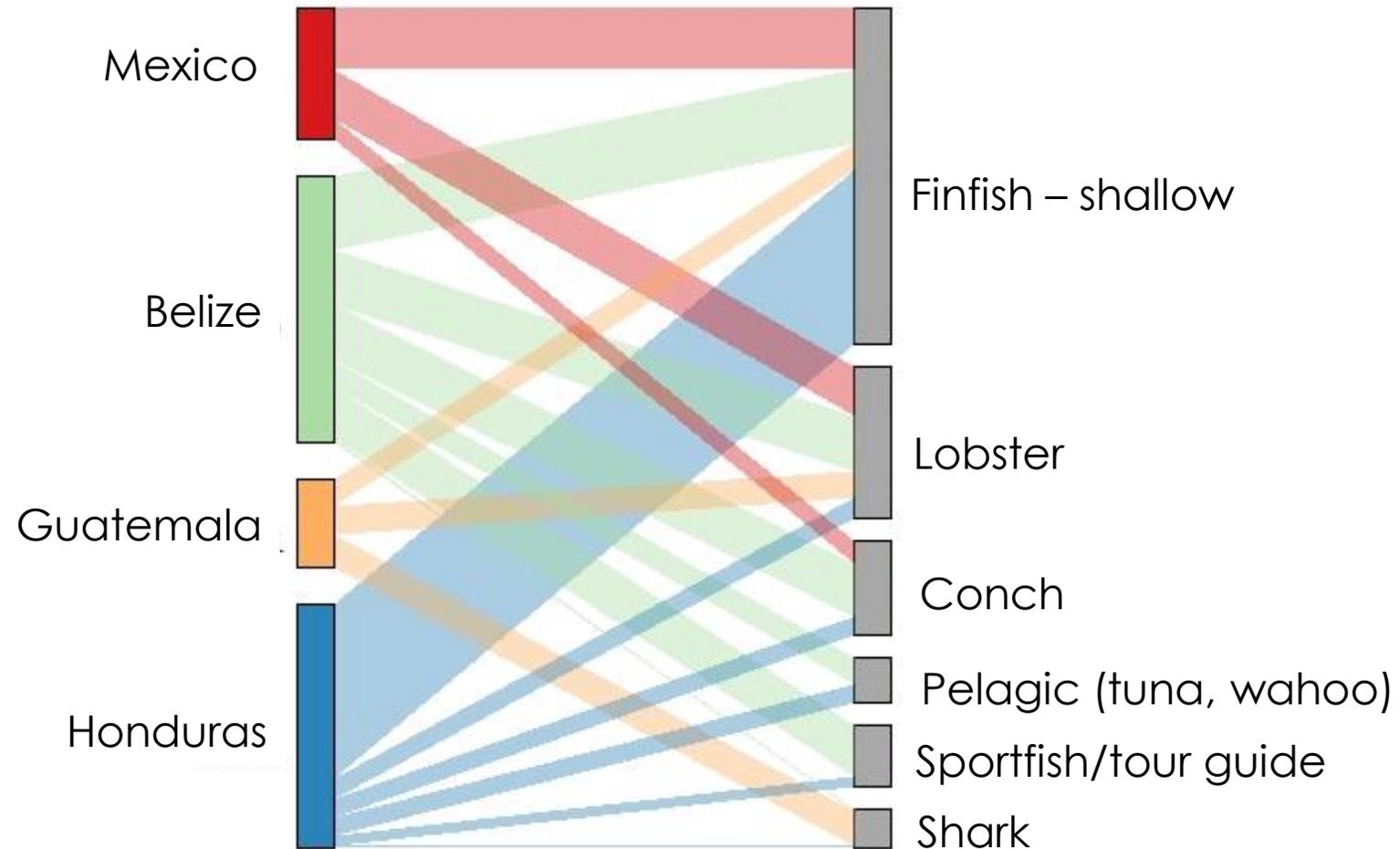
¿Por qué pescas en aguas profundas?



¿Qué equipo usas?



¿Qué más pescas?



Meses preferidos para la pesca en aguas profundas

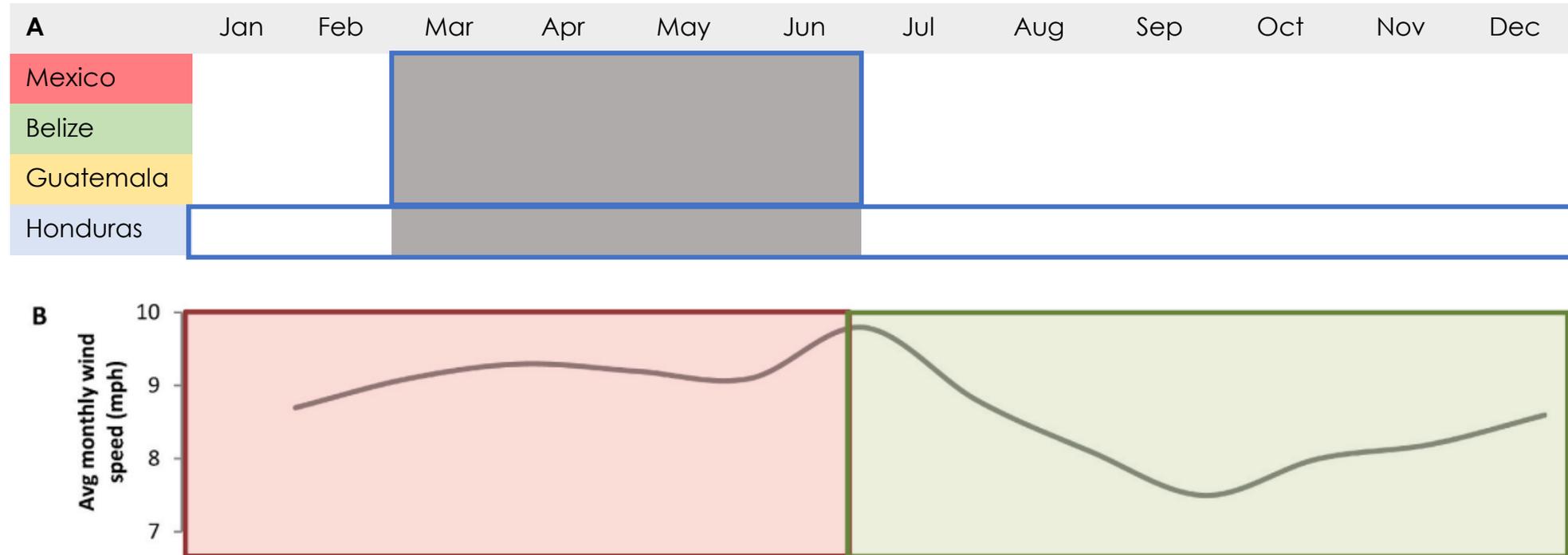
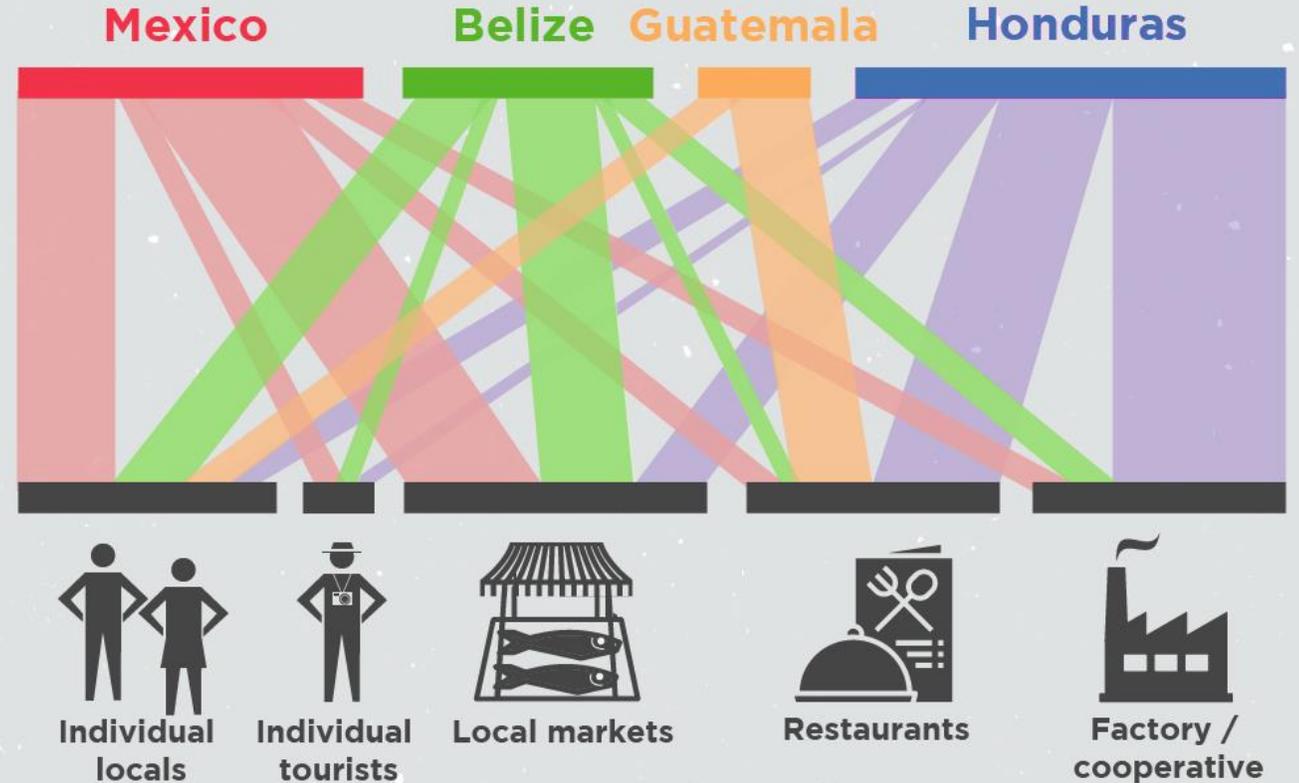


Fig. 4. A) Preferred months for deepwater fisheries in the MesoAmerican Reef countries highlighted with diagonal hatched bars, overlaid on country-specific closed seasons for lobster (filled grey boxes), which is economically the most important fishery in the region; B) Mean monthly wind speed in Belize, with higher monthly averages in the red box, and lower wind speeds in the green box. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

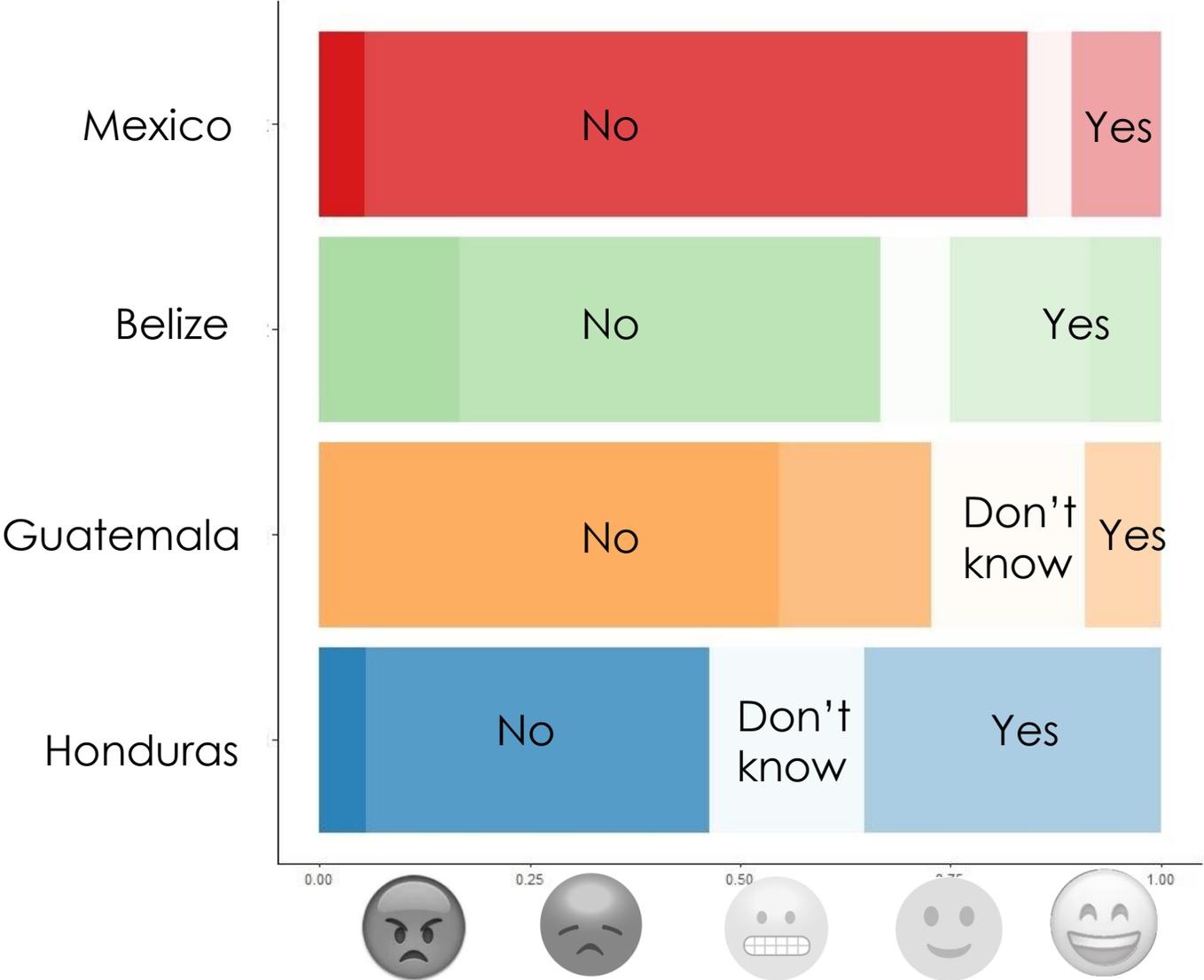
Mercados

Fishers largely sold directly to consumers, whether individuals, restaurants, or fish markets.

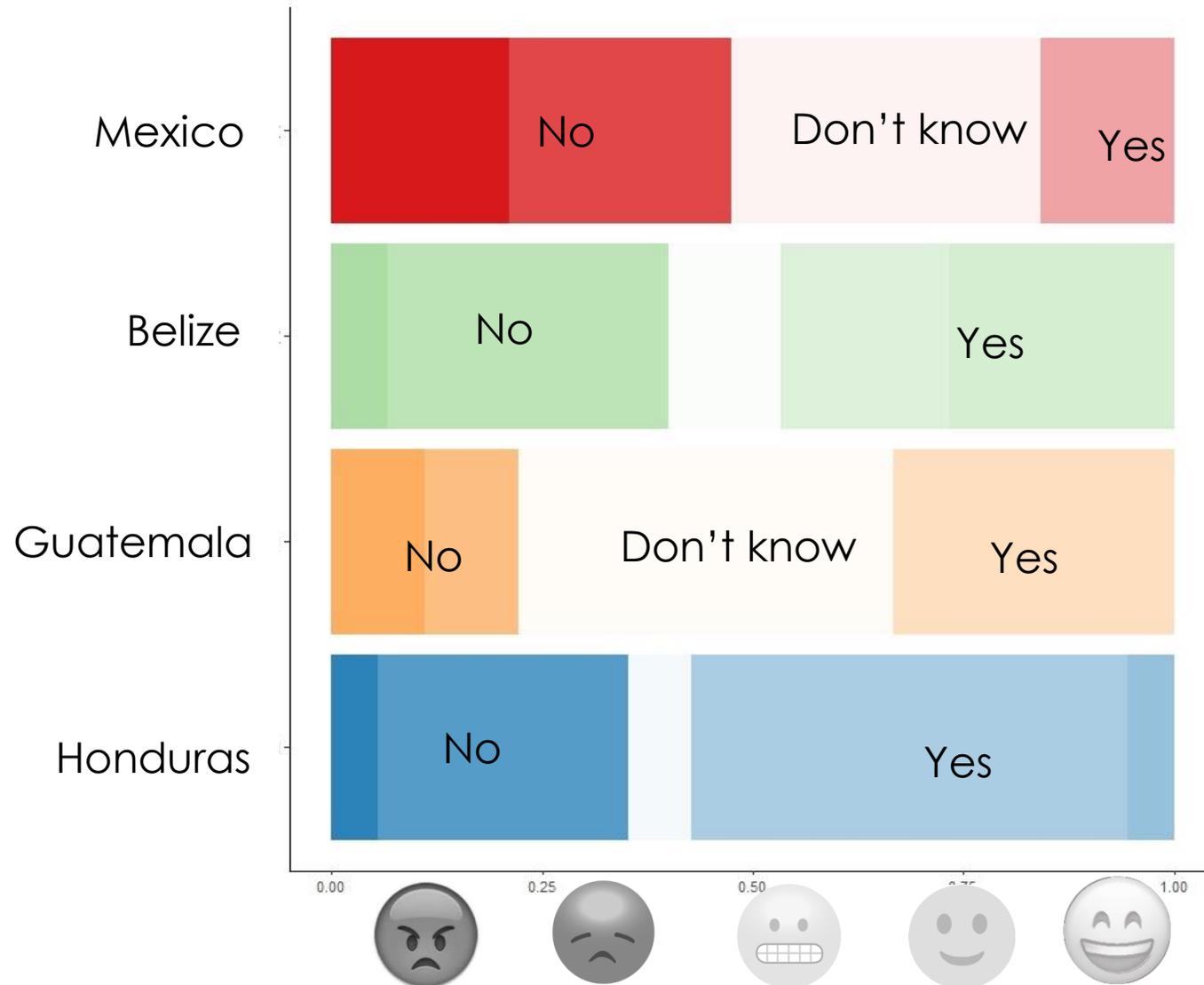
Honduras is the only country with an export market for deepwater fishes.



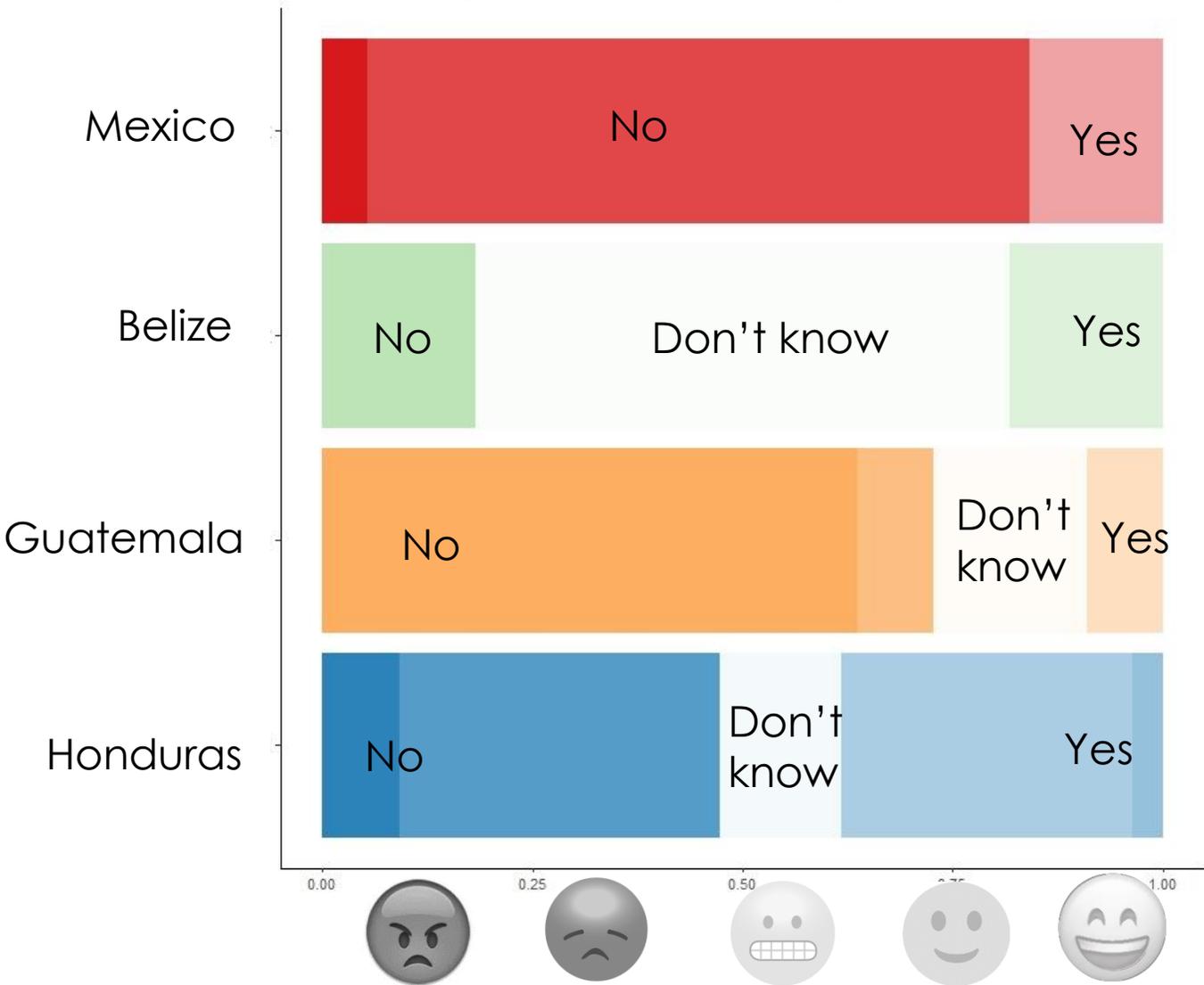
Es más fácil atrapar peces de aguas profundas



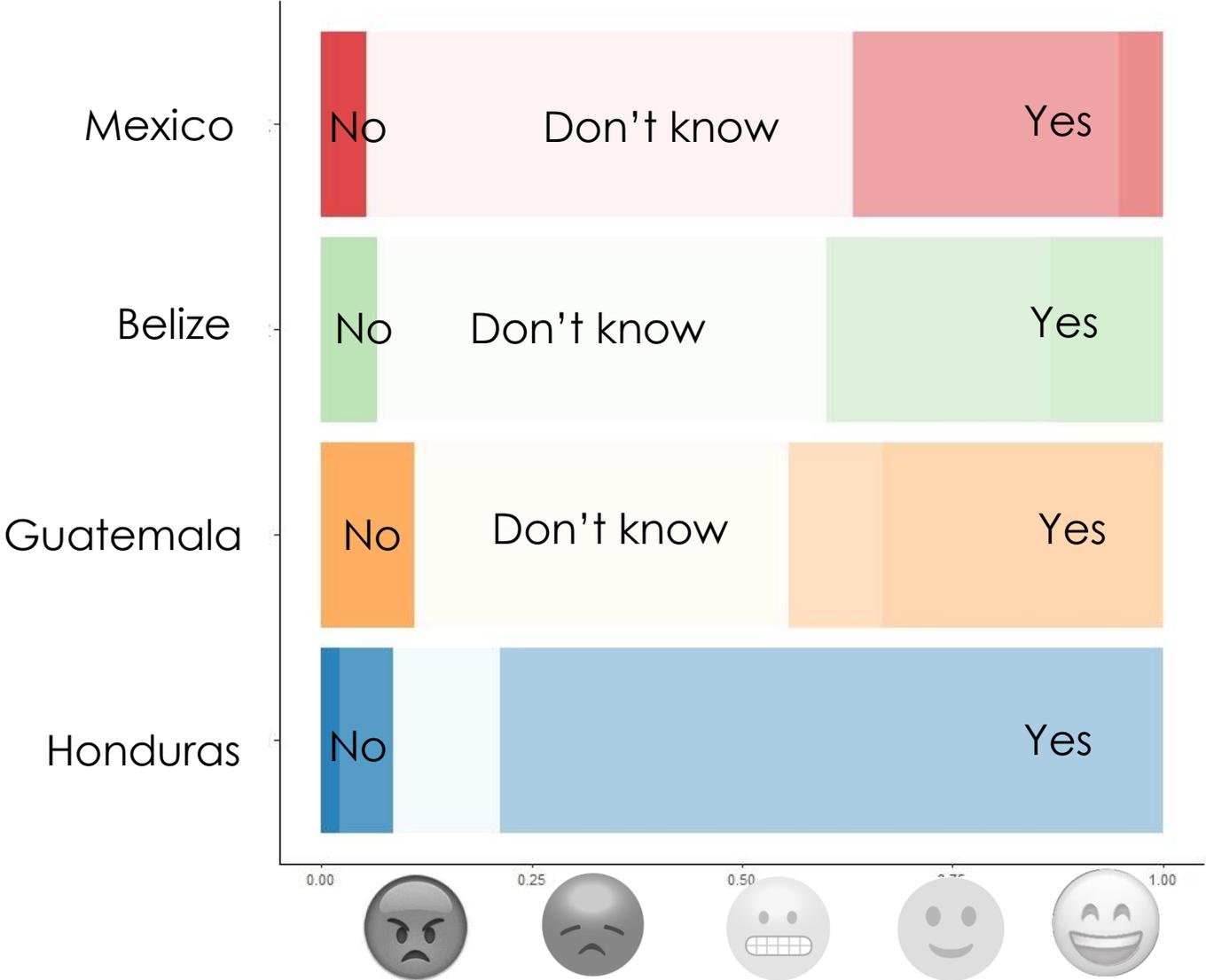
Las pesquerías de aguas profundas necesitan gestión



Hay más peces ahora que cuando empecé a pescar



Estaré pescando más en aguas profundas en el futuro



Puntos principales

Amplia variedad de artes de pesca
Palangre mayormente vertical

La mayoría de los pescadores
venden a particulares o
restaurantes

Solo Guatemala usa redes de
enmalle Tiburones objetivo

Solo Honduras cuenta con
embarcaciones semi-
industriales para aguas
profundas (Islas de la Bahía)

Único país que exporta
pescado

La pesca en Belice es la
más joven pero va en
aumento

Puntos principales

Fisher perceptions of the deepwater fishery

Most fishers reported:

- **Catching fewer fish.**
- **That they would be fishing in deep waters in the future.**

Fisher perceptions

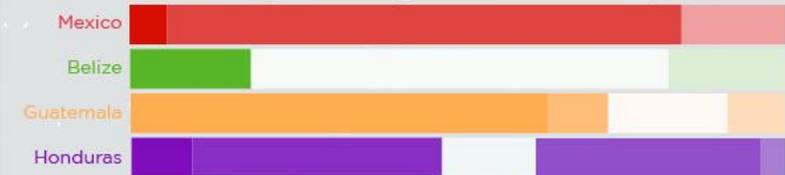
Strongly disagree Neutral Strongly agree



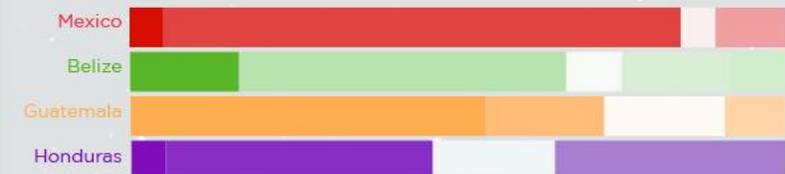
1. Deepwater fisheries need management



2. There are more fish deep water than when I began



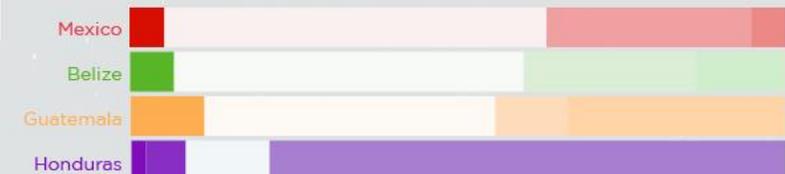
3. It is easier to catch fish in deep water



4. Deepwater fishing is more profitable



5. I will be fishing more in deep waters in the future



Project Brief

Characteristics of the deepwater fishery of MesoAmerica

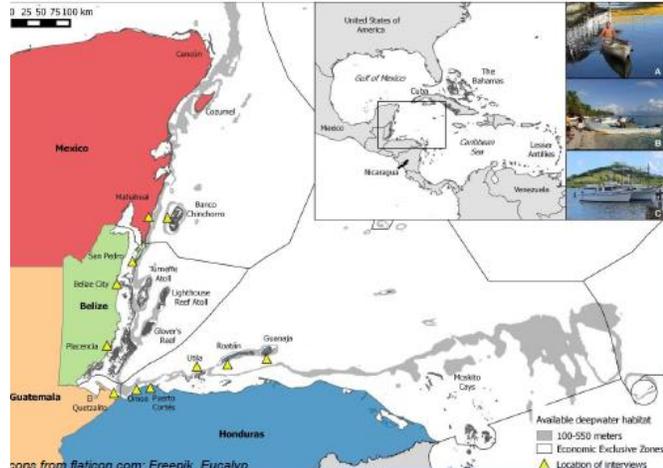
2021 DW MAR

Deepwater fisheries in the Caribbean waters of Mexico, Belize, Guatemala, and Honduras are currently unmanaged, and there is very little monitoring of fisheries. These fisheries are expanding due to declines in coastal fisheries and increasing demand for high quality fish from domestic and international markets. Deepwater fishes tend to be more vulnerable to overfishing than coastal fishes because they grow slower, live longer, and reproduce less often.



We conducted surveys in four countries that comprise the MesoAmerican Reef (MAR) to assess the history of the fishery, current trends and prices, and perceptions of fishers about the status and future of the deepwater fishery.

122 Fishers surveyed
4 Countries



←MAR countries and their exclusive economic zones, with the available deepwater fishing grounds (depths between 100 and 550 meters) overlaid in grey. Yellow triangles indicate localities of interviews. Boat pictures represent the variety of vessel sizes participating in the fishery, (smallest to largest; A-C).

Photo credit: A) Gabriela Ochoa; B) Rachel Graham; and C) Ivy Baremore.

For more information visit www.maralliance.org



Fishing down the reef slope: Characteristics of the nearshore deepwater fisheries of MesoAmerica

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Guatemala
Honduras
IUU
Local ecological knowledge
Longline
Mexico
Perceptions

ABSTRACT

Deepwater fisheries in the Caribbean waters of Mexico, Belize, Guatemala, and Honduras are currently unmanaged, and there is very little monitoring of fishery landings. Increasing demand for high quality fish has led to the continued expansion of coastal fisheries into deeper waters in the region over several decades. The deepwater fisheries of the MesoAmerican Region are mostly small-scale, but they target species that are likely vulnerable to overexploitation due to conservative life history characteristics common to deepwater fish, including slow growth, late maturity, and low natural mortality. A total of 122 deepwater fishers from Mexico, Belize, Guatemala, and Honduras were interviewed to assess their perceptions on the status and future of deepwater fisheries, its history, current trends and prices. Deepwater fisheries in the region were mostly likely established in the 1970's, though outside of Belize fishers reported a longer perceived timeline. Fishers in Mexico, Belize, and Honduras mostly targeted snapper species, including silk (*Lutjanus vivanus*), blackfin (*L. buccanella*), wenchman/cardinal snapper (*Pristipomoides* spp.), queen (*Etelis oculatus*), vermilion (*Rhomboplites aurorubens*), and black (*Apsilus dentatus*) snappers while those in Guatemala targeted mainly sharks (mostly smoothhounds (*Mustelus* spp.), gulpers (*Centrophorus* spp.), sixgills (*Hexanchus* spp.), night sharks (*Carcharhinus signatus*), and dogfishes (*Squalus* spp.)) and groupers (mostly yellowedge (*Hyporhamphus flavolimbatus*) and misty groupers (*H. mystacinus*)). Fishers largely sold directly to consumers, whether individuals, restaurants, or fish markets, and Honduras is currently the only country with a strong export market for deepwater fishes. As coastal fisheries continue to decline, and access to depth sounders and GPS becomes ubiquitous, fishing effort in these fisheries is expected to continue to increase.

Investigación independiente de la pesca



¿Por qué independiente de la pesca?

- Podemos pescar en áreas donde no hay peces
- Usamos el mismo equipo
- Usamos el mismo cebo cuando es posible

- ¿Cuántos peces?
- ¿Qué edad tienen los peces?
- ¿Son maduros?
- ¿Cuándo y dónde desovan?



Métodos

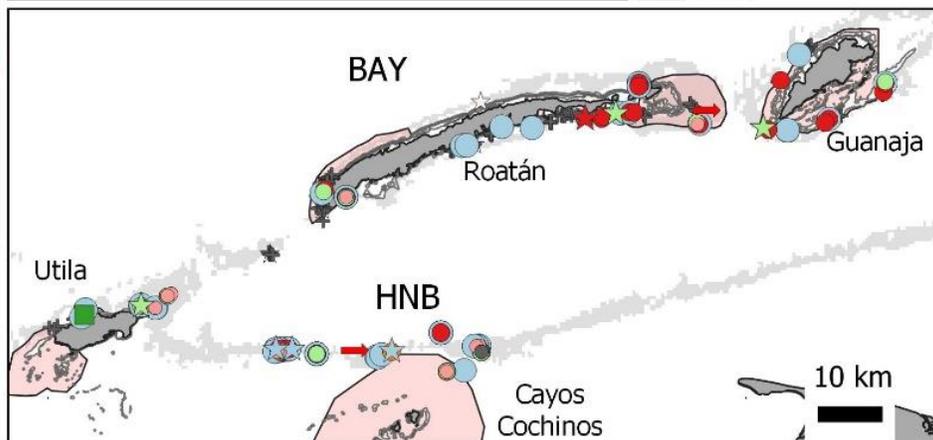
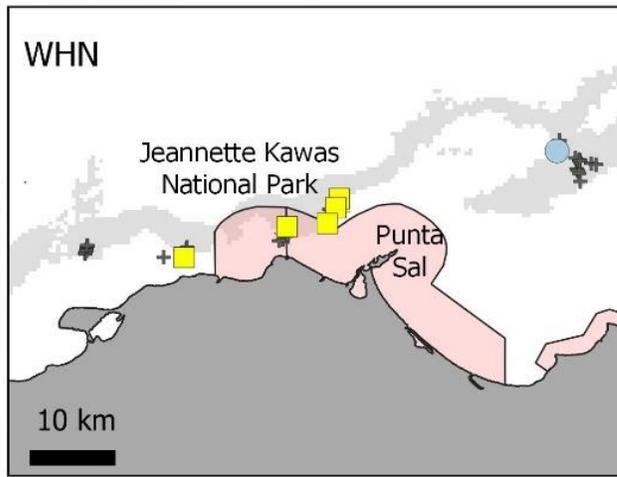
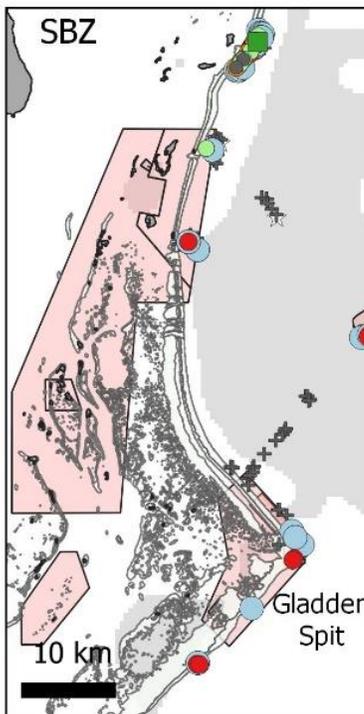
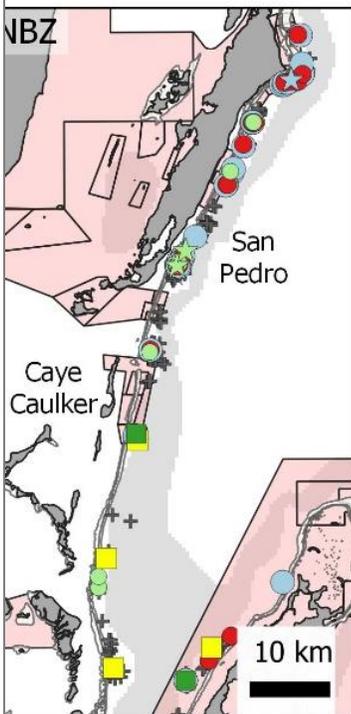
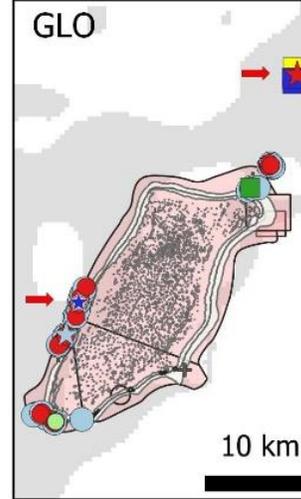
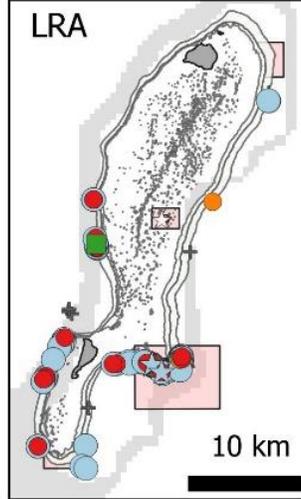
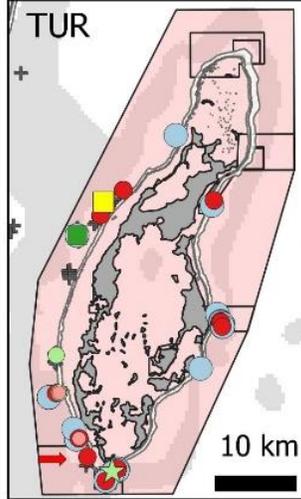
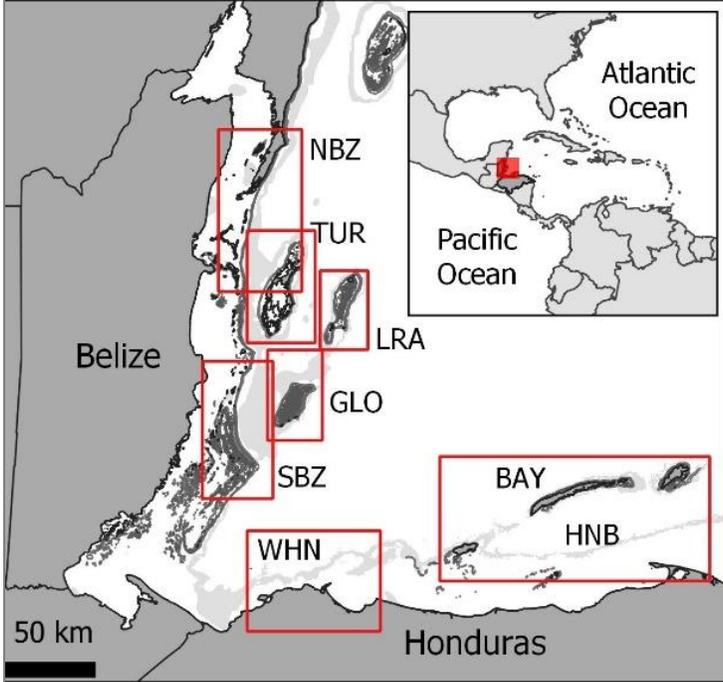
- Palangre vertical
 - Mano desplegada
 - Repetible, portátil
 - 5 ganchos
 - Temperatura, profundidad (TDR)
- Video submarino remoto con caranda profundo (BRUV)
- Muestreo dependiente de la pesquería
- Belice y Honduras
 - 2015-2022



Muestreo



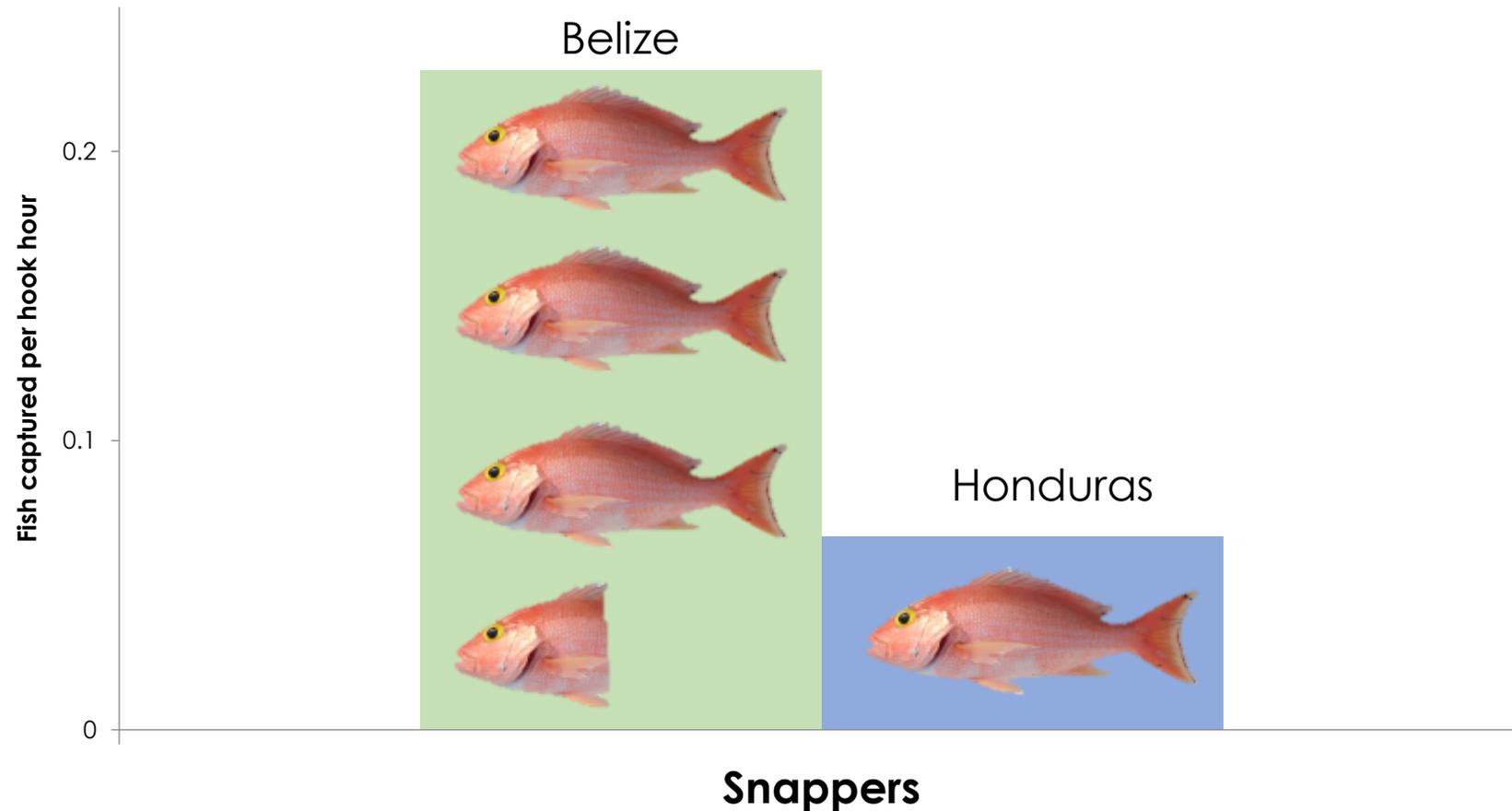
- Pescado retenido, medido, pesado
- Condición reproductiva evaluada
- Otolitos, tejido muscular almacenado
- $CPUE = \frac{\# \text{ individuals captured}}{\# \text{ hooks} * \text{ soak time (hrs)}}$



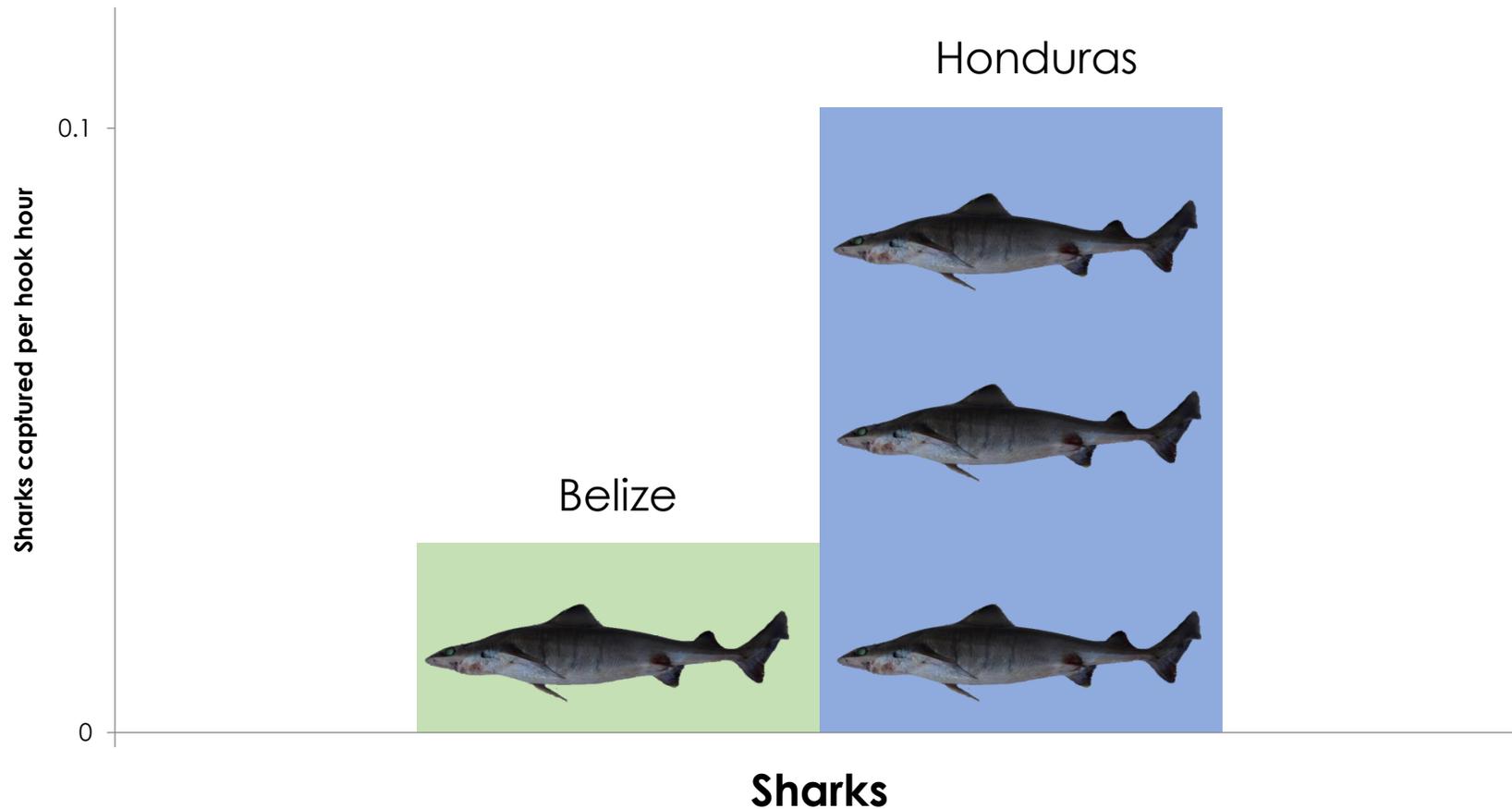
- Black snapper
- Blackfin snapper
- Cardinal snapper
- Queen snapper
- Silk snapper
- Vermillion snapper
- Yellowedge grouper
- Misty grouper
- Snowy grouper
- + No capture
- MPA

¿Qué hemos encontrado hasta ahora?

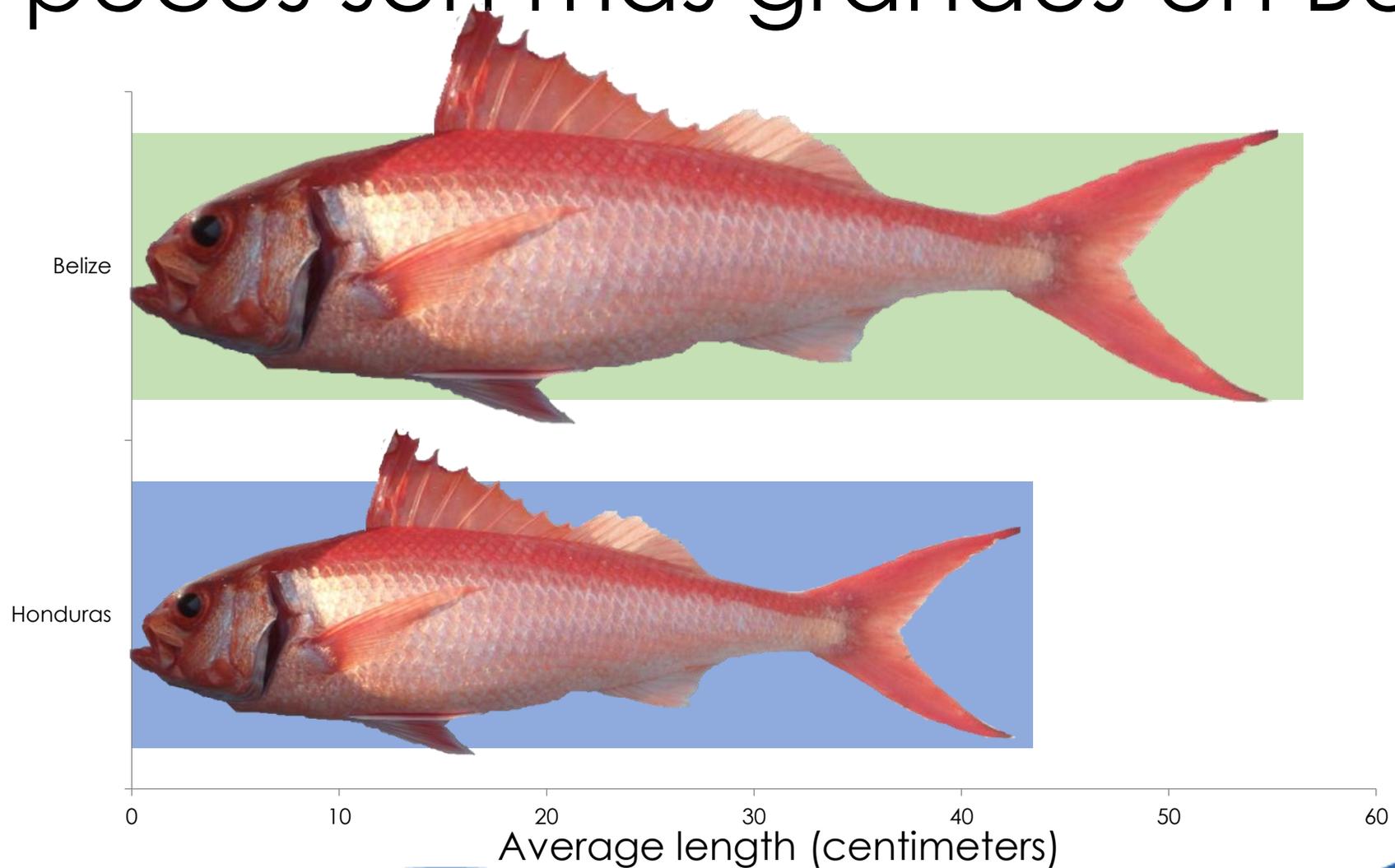
Hay más pargos de aguas profundas en Belice que en Honduras



Hay más tiburones de aguas profundas en algunas partes de Honduras



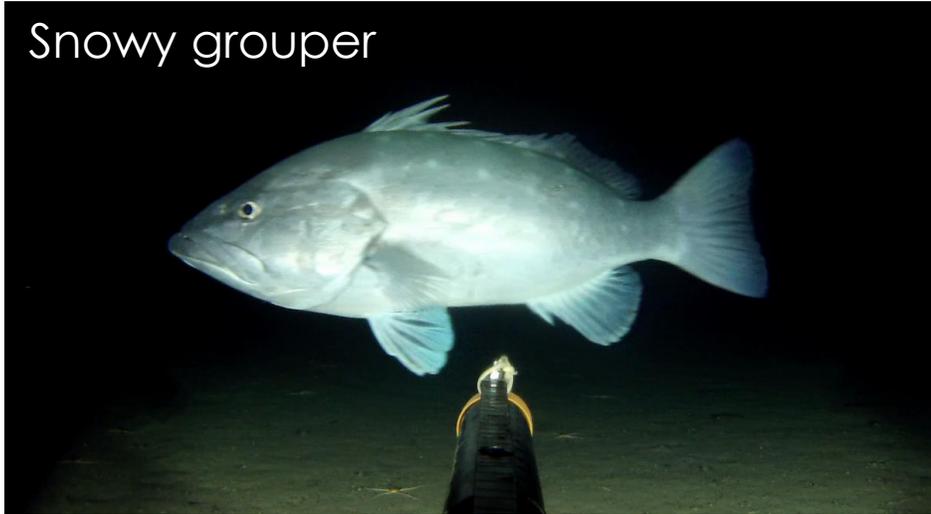
Los peces son más grandes en Belice



BRUV de aguas profundas

Abundancia, hábitat, base de presas

Snowy grouper



Silk (yelloweye) snappers



Queen snapper
Smooth dogfish shark



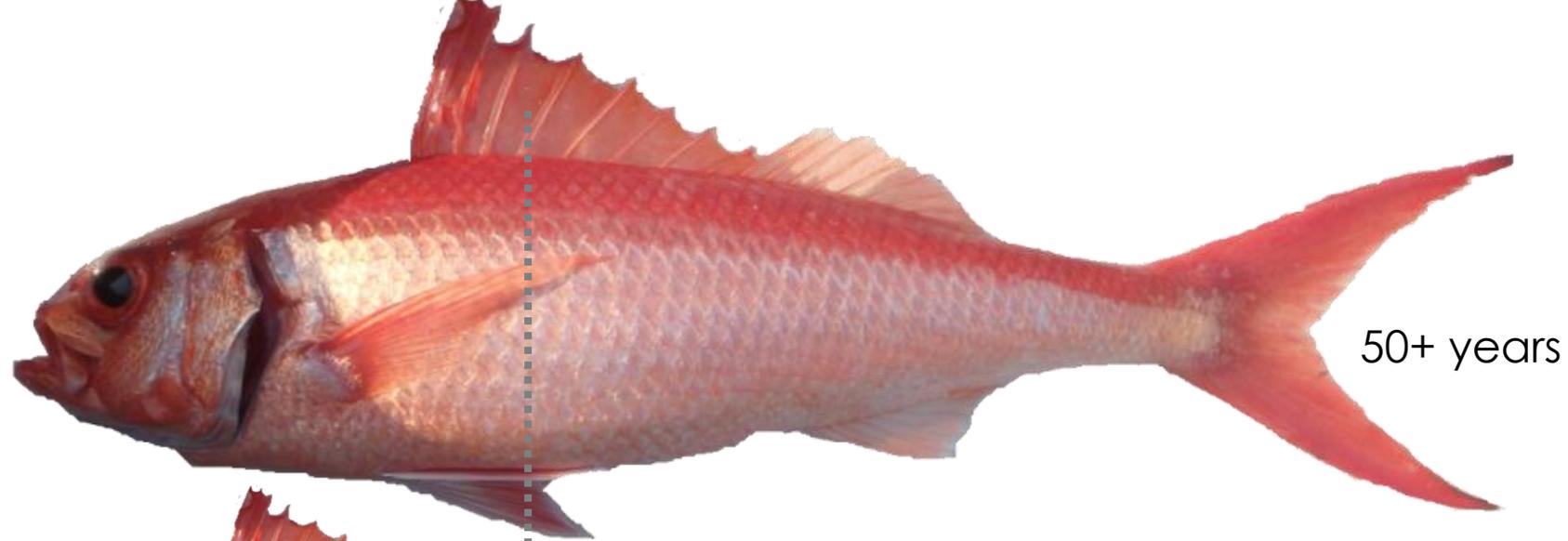
Atlantic sixgill shark



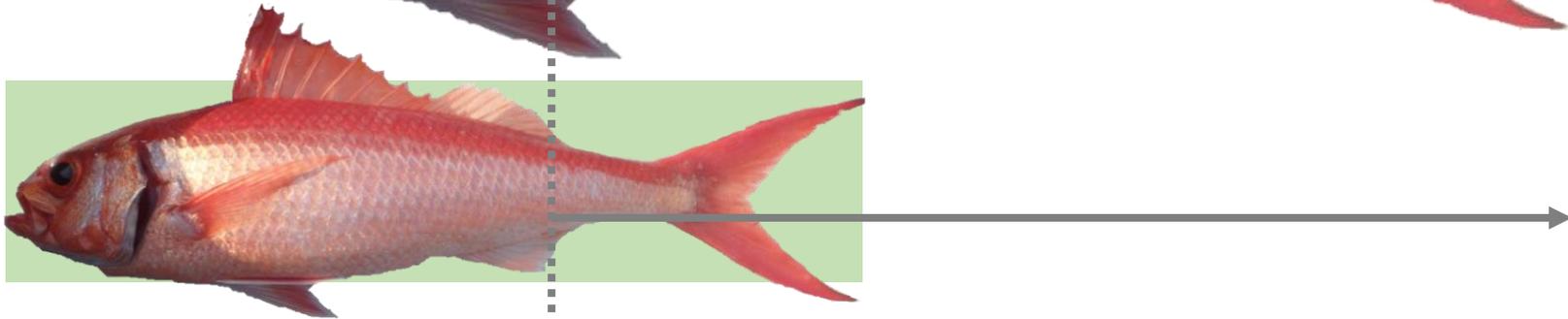
¿Qué significa esto?

- Pesquería en Belice no completamente establecida
 - Menos gente, sin mercado de exportación
- Cerca de la costa Islas de la Bahía de Honduras altamente explotadas
 - ¿Los bancos extraterritoriales siguen siendo números altos?
 - Más difícil para los pescadores de subsistencia pescar
- Si los peces son longevos, son más vulnerables de lo que pensábamos

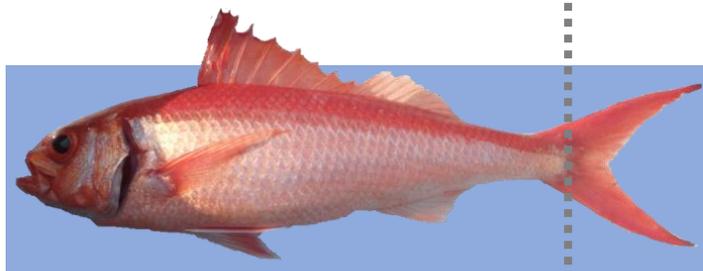
■ Max



■ Belize



■ Honduras



0.0 10.0 20.0 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0

Average length (centimeters)

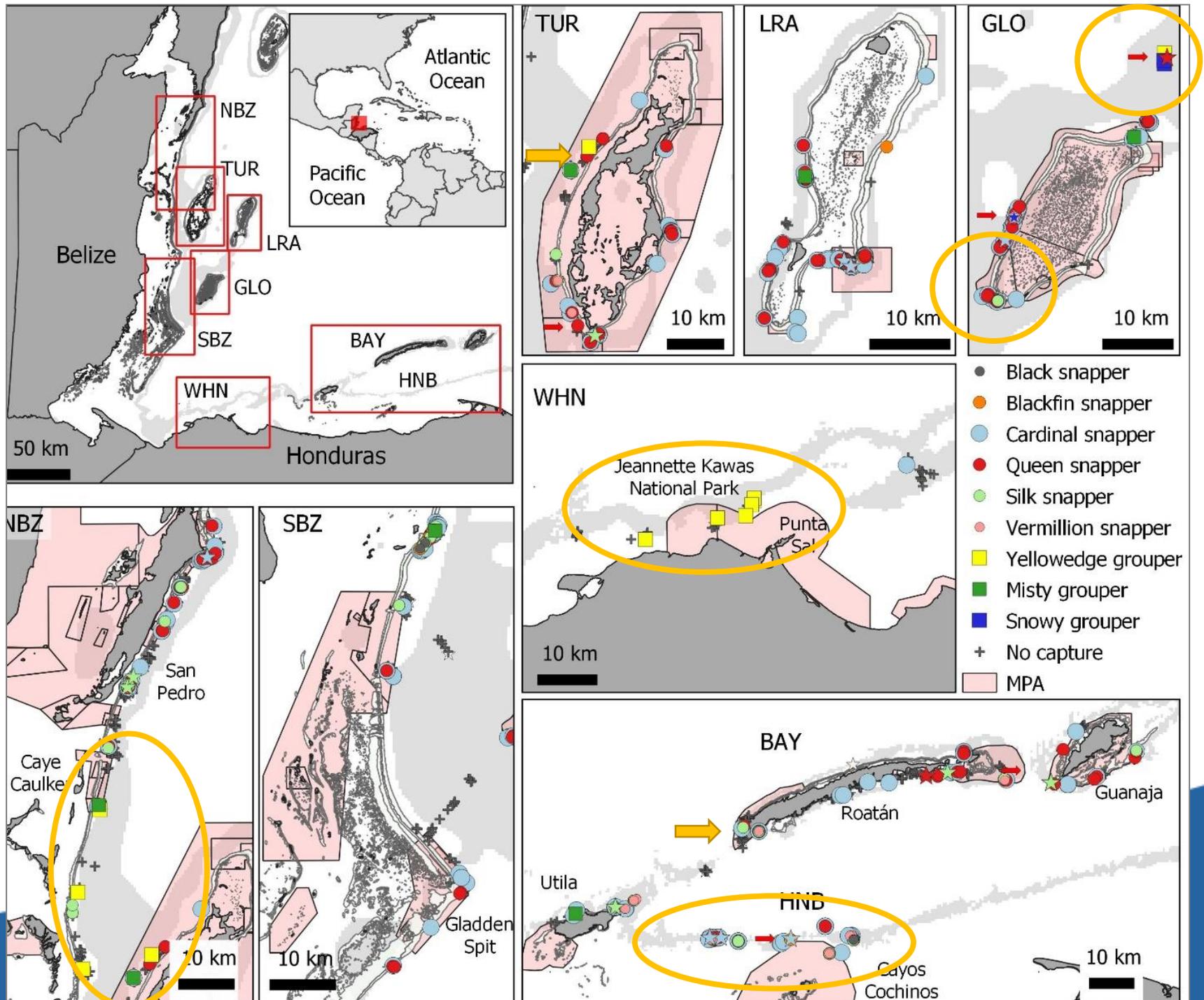


Ideas para la conservación y la sostenibilidad

- Cierres de zona horaria
 - Desove
 - Meses de otoño
- Consumidores de alto nivel
 - Restaurantes de sushi
 - Los precios más altos
- **Evite los meros**



Áreas importantes para la conservación



¿Ahora que?

- Validar edades
- Estructura genética
- Continúe buscando áreas importantes para los peces
 - Zonas y épocas de desove
 - Más caídas de cámara
 - Hidrófono



¿Ahora que?

- ¡Tiburones!
 - Necesidad de identificar varias especies
 - Etiquetado satelital



¿Preguntas o comentarios?

Funders



Partners

