

Comisión Interamericana del Atún Tropical
Inter-American Tropical Tuna Commission



The tropical tuna in the EPO: background on the fisheries, assessment and management

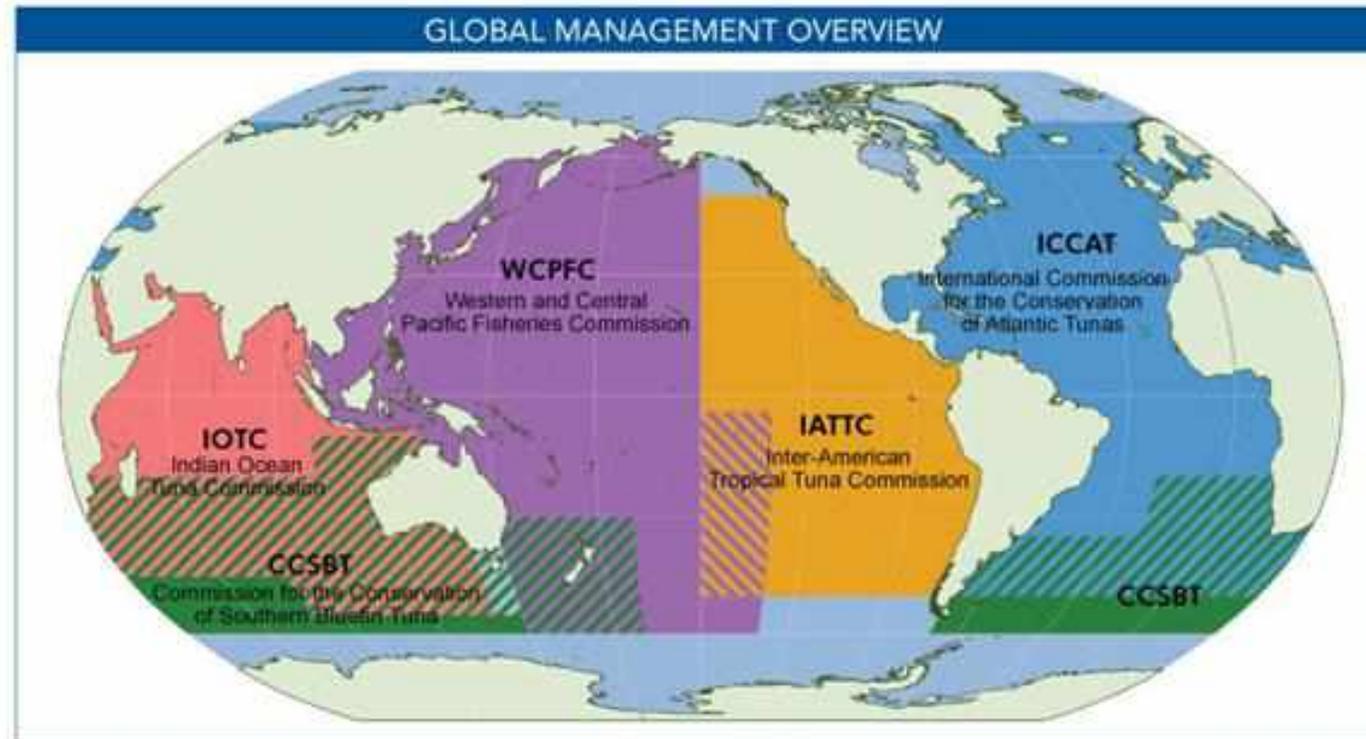
1st External review of data used in stock assessments of tropical tuna in the eastern Pacific Ocean
2 - 6 Oct 2023 - Videoconference

Outline

- IATTC structure
- The tropical tuna fisheries
- The data collection programs
- Scientific research
- Stock assessment process
- Management



IATTC structure: Convention area



- 1949 Convention: Establishes the IATTC (signed between US and Costa Rica)
- 2003 Antigua Convention: ecosystem approach to fisheries

IATTC structure: Members

Currently, the members of the IATTC are: 21

 BELIZE	 CANADA	 CHINA
 COLOMBIA	 COSTA RICA	 ECUADOR
 EUROPEAN UNION	 FRANCE (OT)	 GUATEMALA
 JAPAN	 KIRIBATI	 KOREA
 MEXICO	 NICARAGUA	 PANAMA
 PERU	 EL SALVADOR	 CHINESE TAIPEI
 UNITED STATES	 VENEZUELA	 VANUATU

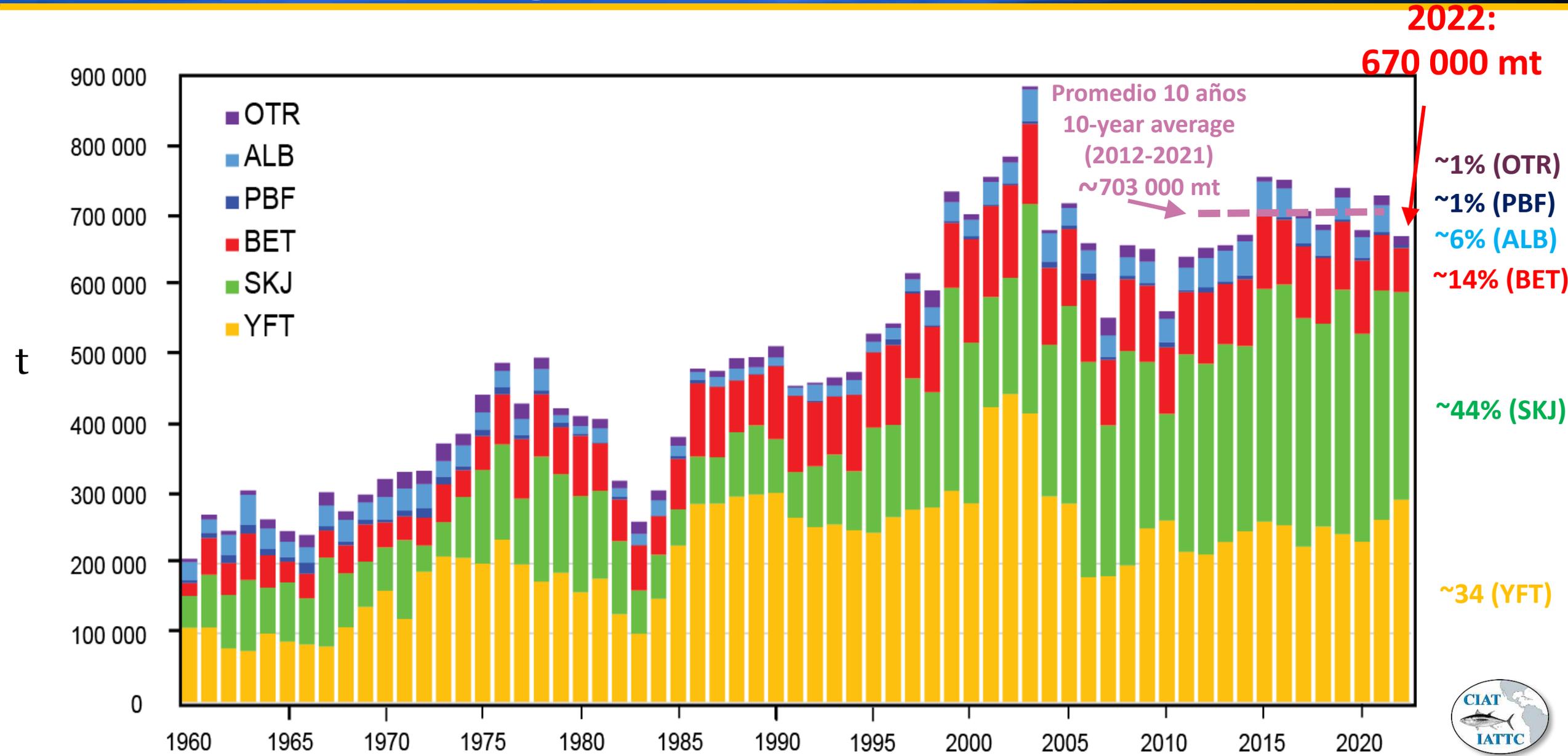


The cooperating Non-Members (CNM) of the IATTC are: 5

 BOLIVIA	 CHILE	 HONDURAS
 INDONESIA	 LIBERIA	

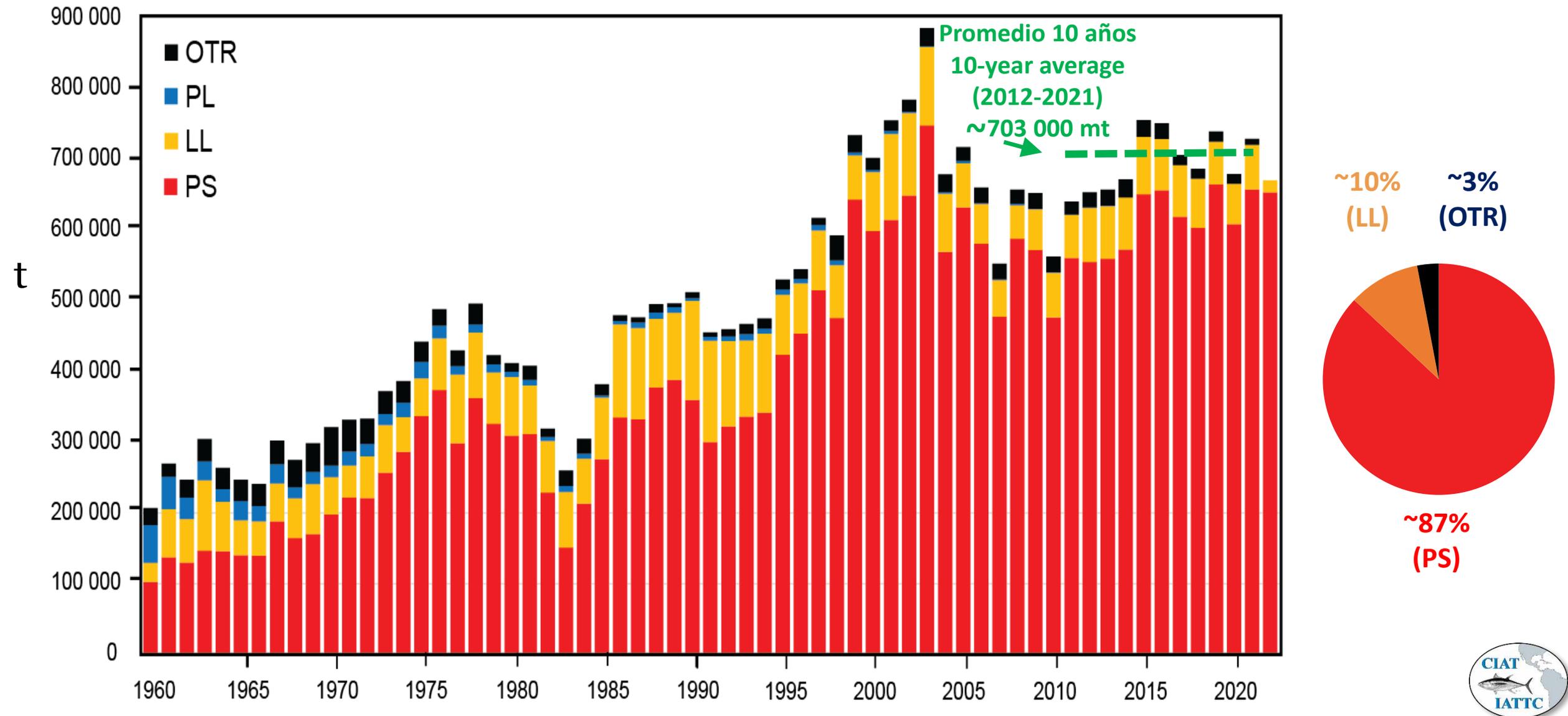
OPO captura retenida – todos los artes

EPO retained catch – all gears



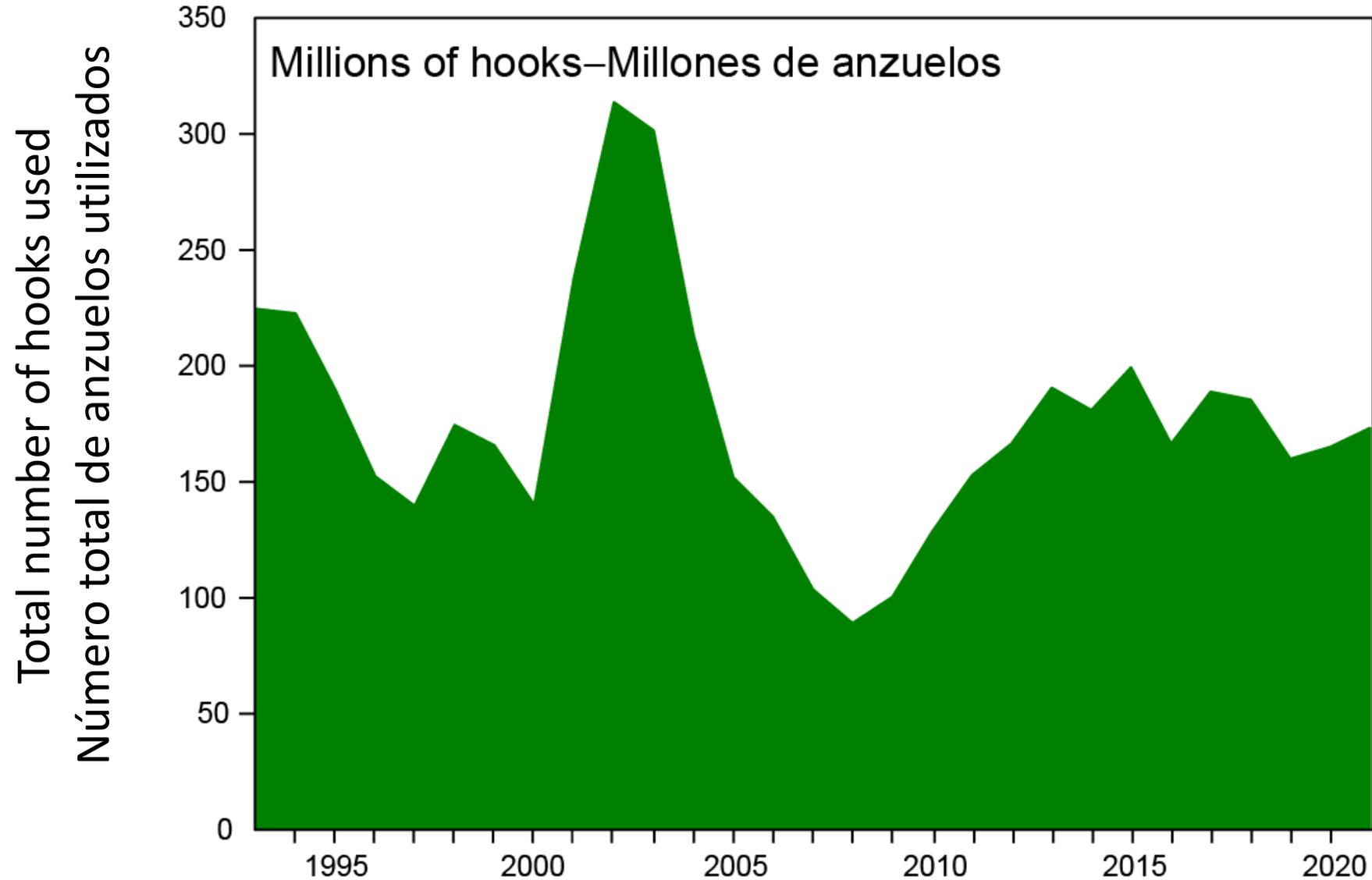
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EPO retained catch – all gears

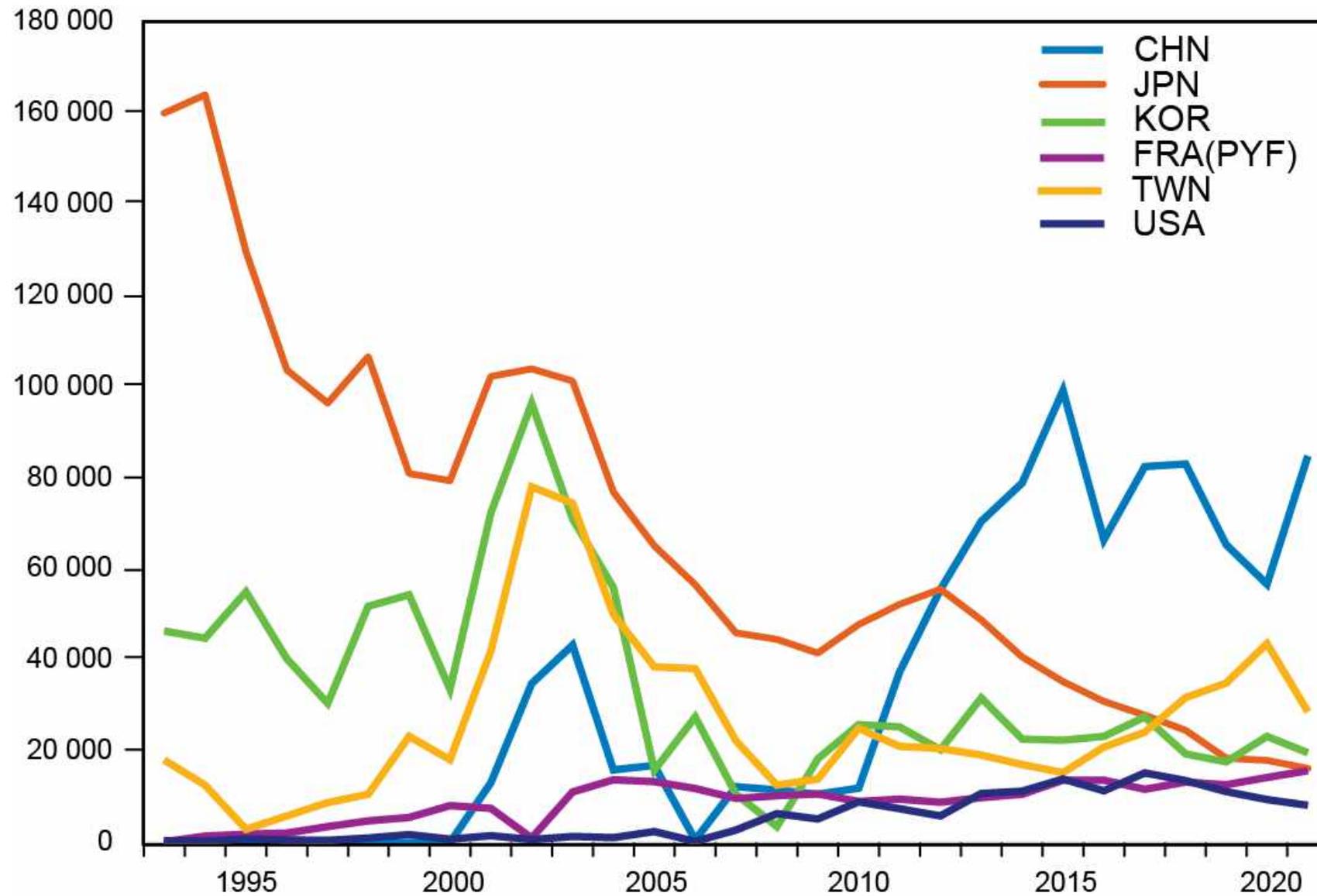


Esfuerzo de pesca: pesquería de palangre

Fishing effort: longline fishery

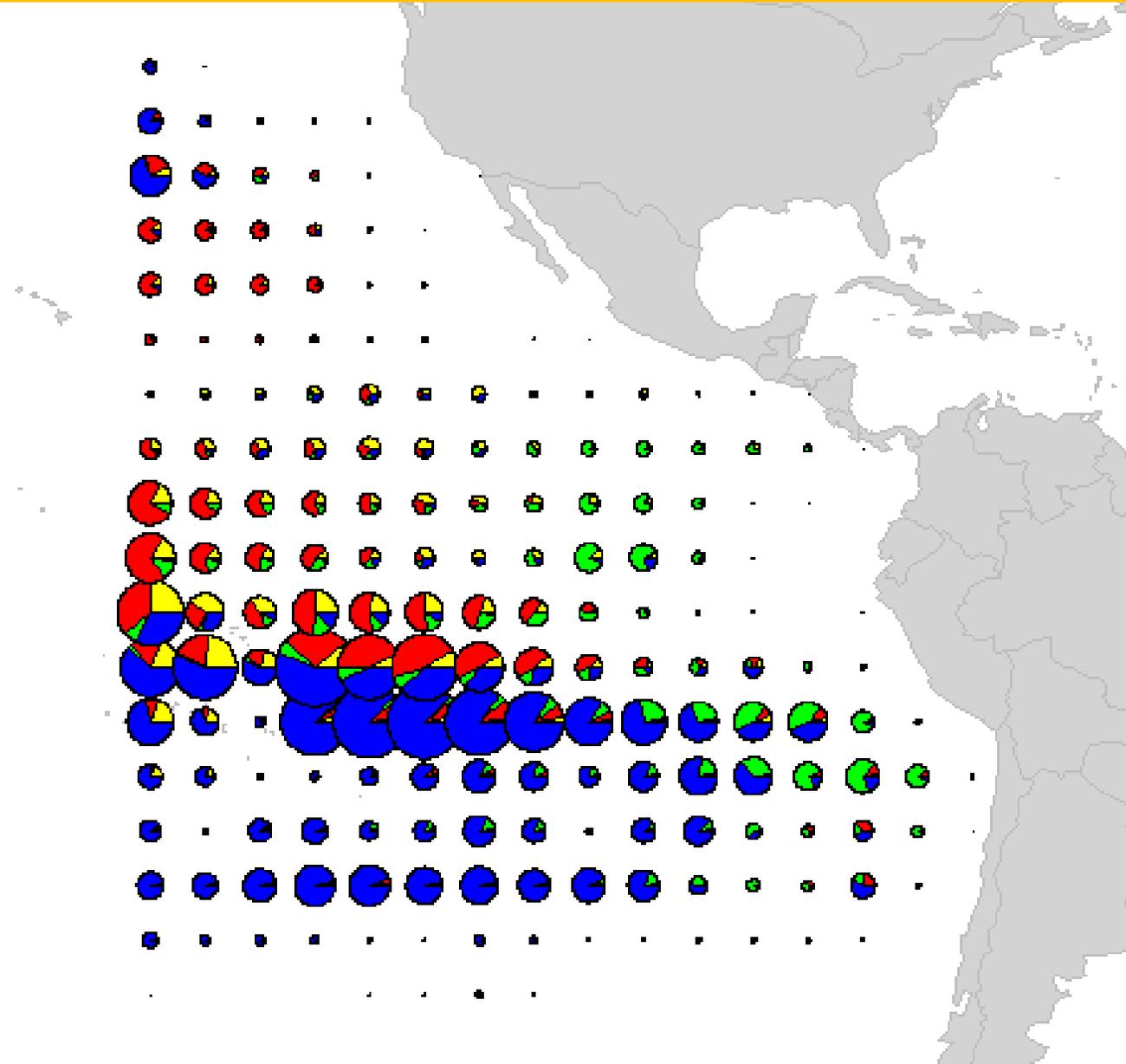
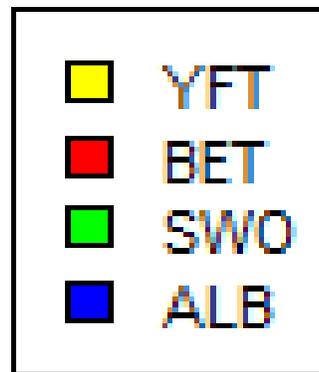


title



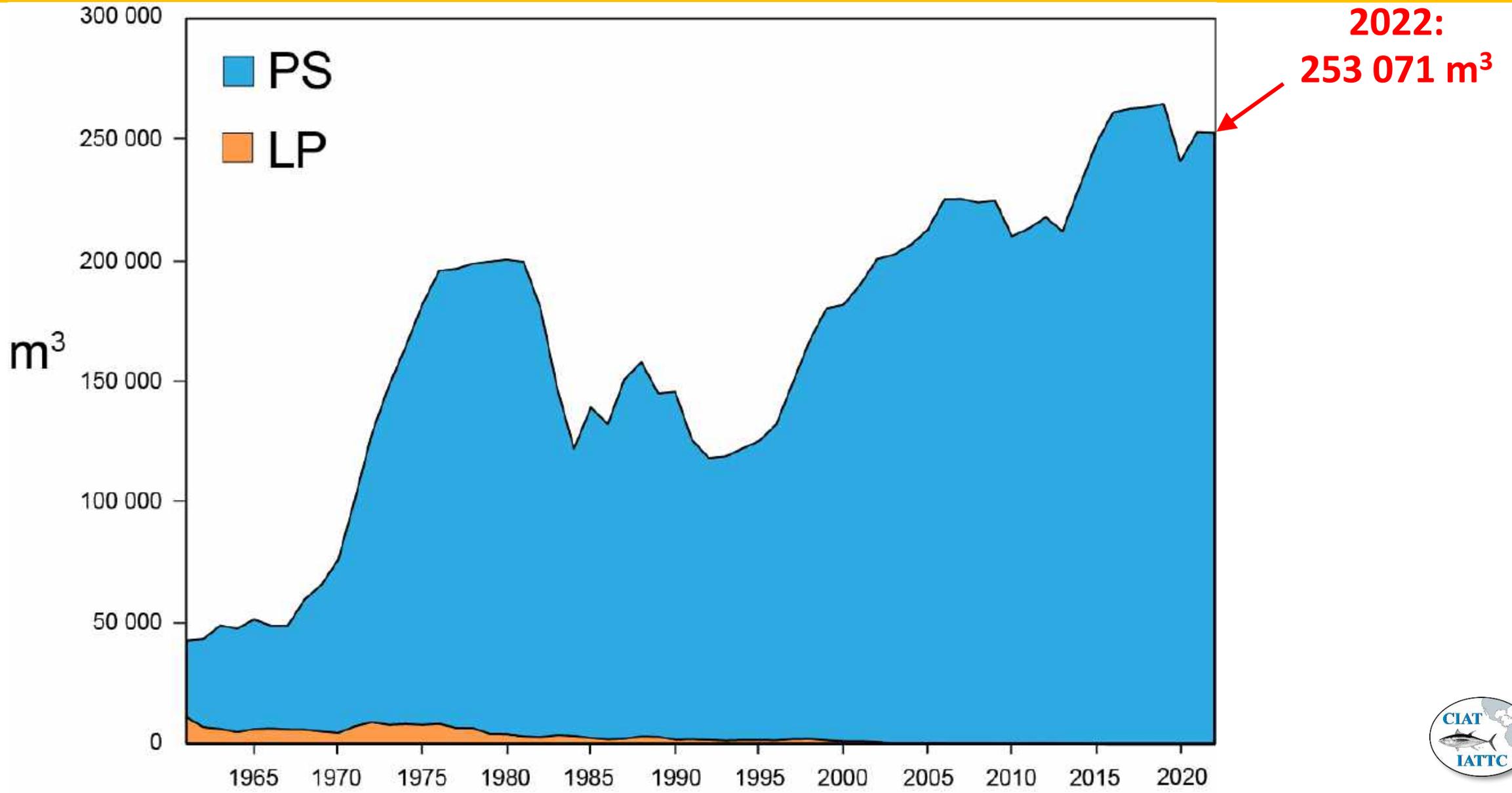
Distribución de las capturas palangreras (2017-2021)

Distribution of the loingline catches (2017-2021)



Capacidad de la flota

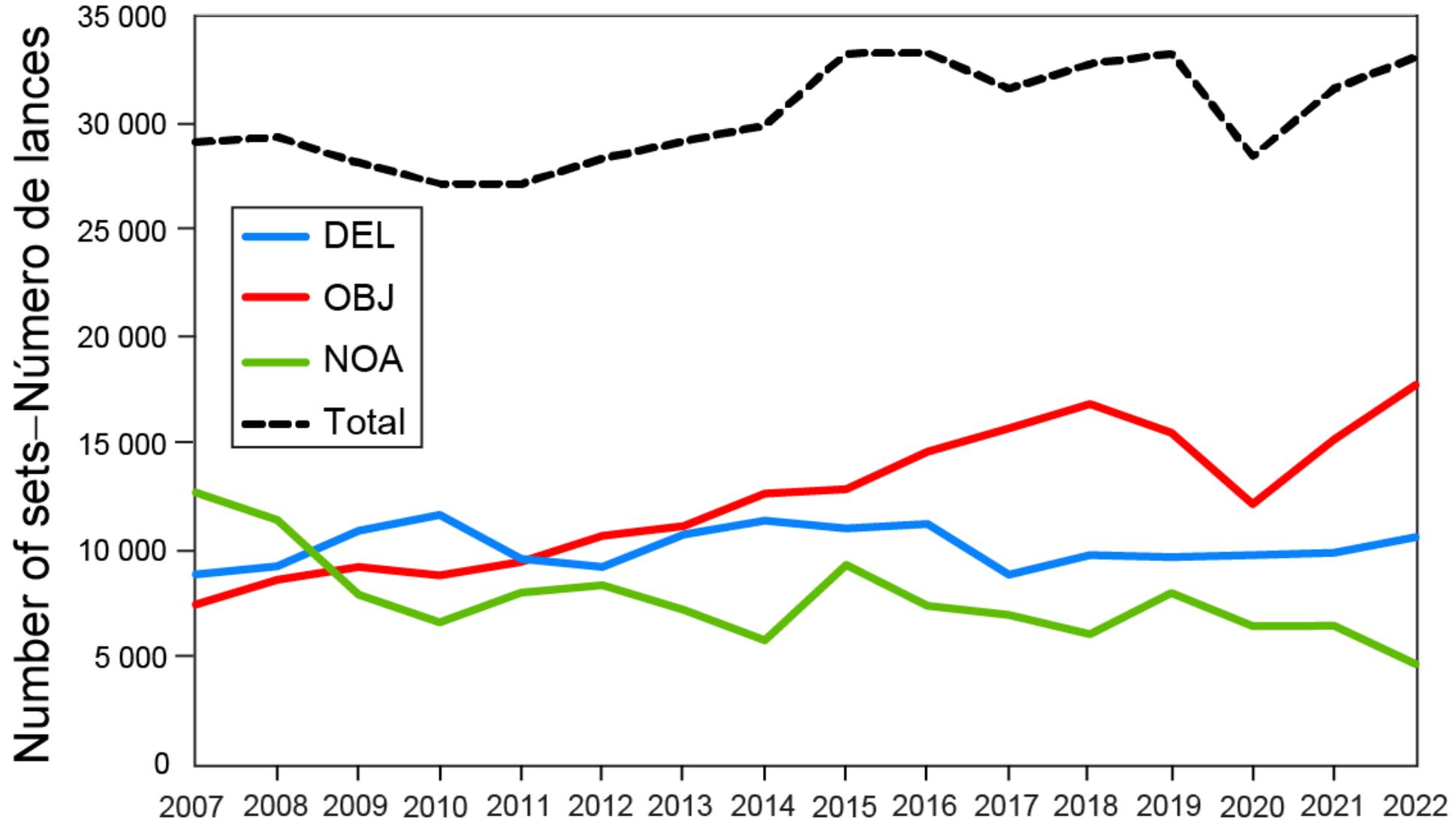
Fleet capacity



Esfuerzo de pesca: pesquería de cerco

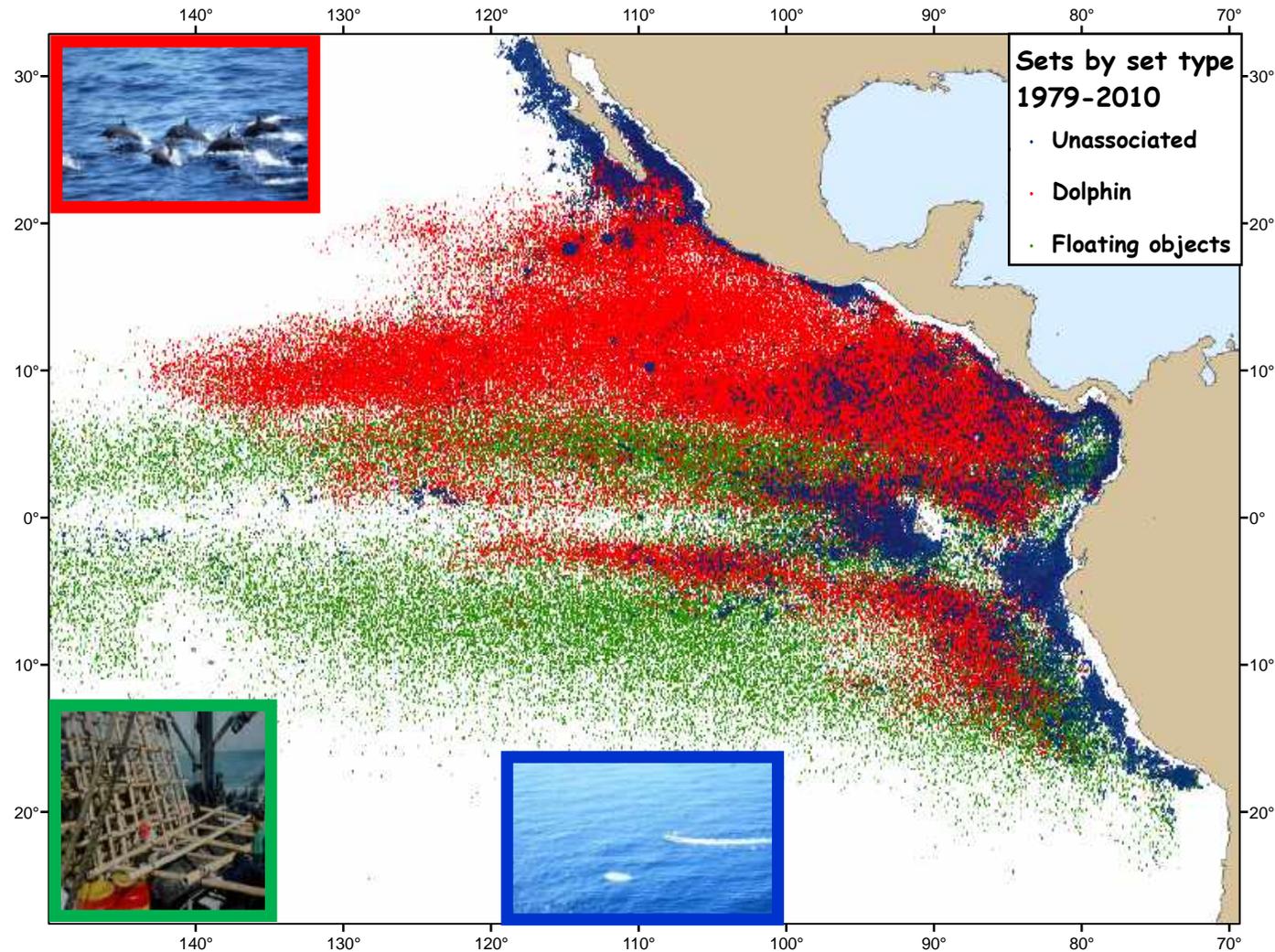
Fishing effort: purse-seine fishery

Numero de lances de cerco, por tipo / Number of purse seine sets, by set type



Purse seine tuna fisheries in the EPO

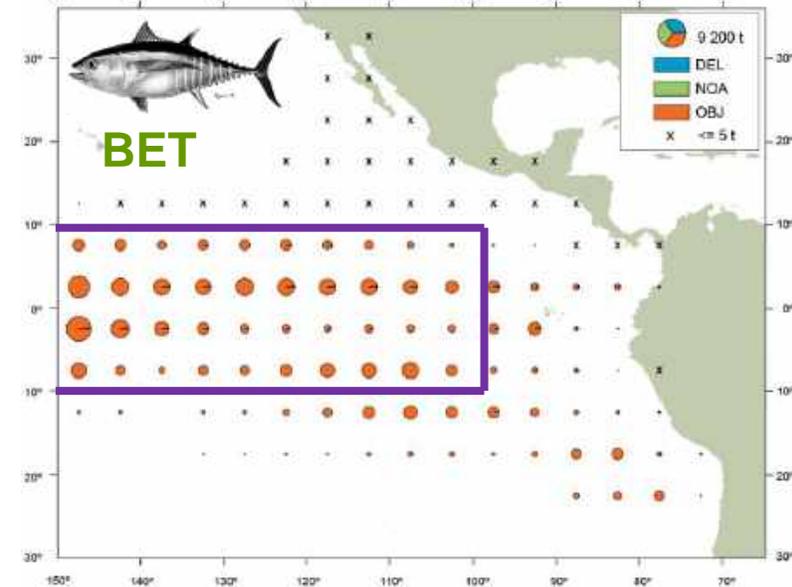
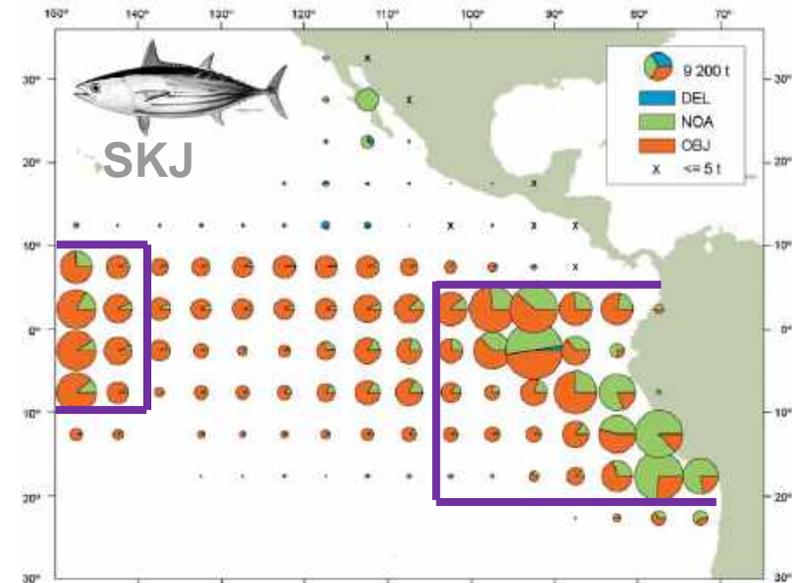
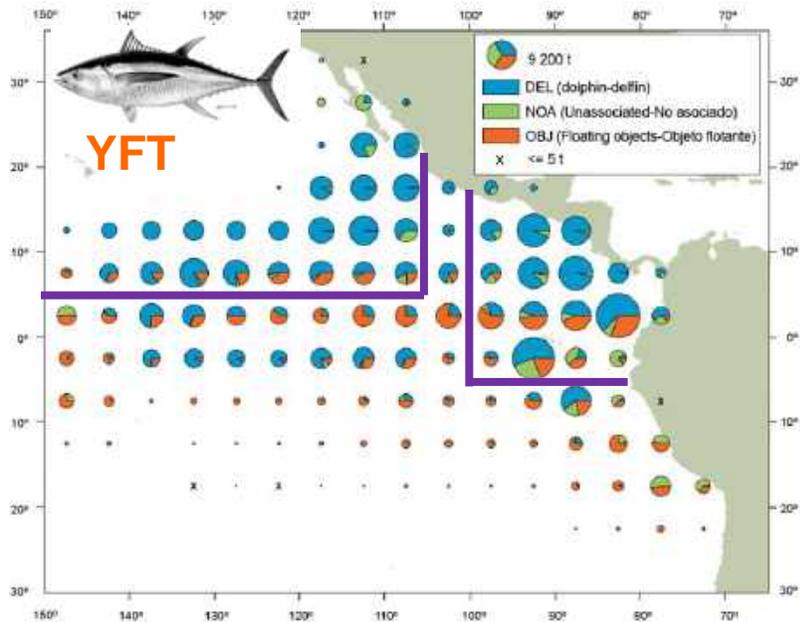
3 set types



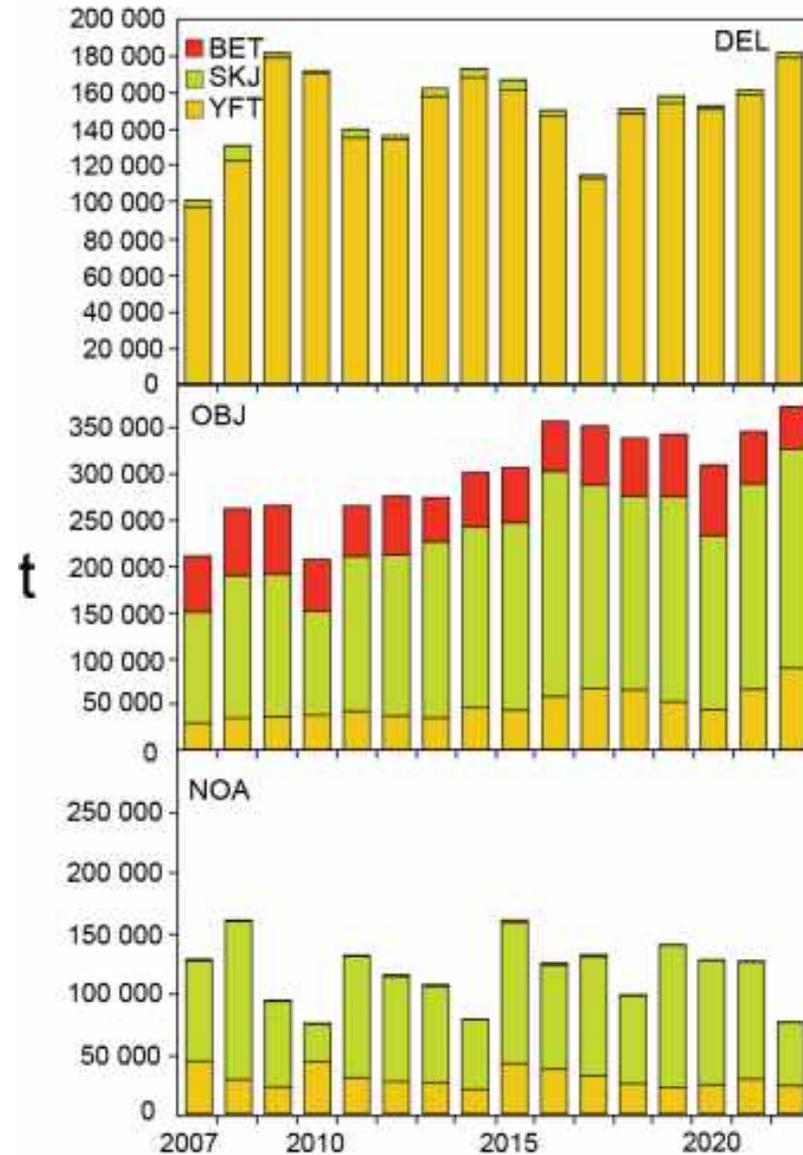
Purse seine tuna fisheries in the EPO

3 set types

Average annual distributions of tuna purse seine catches, by set type, 2017-2021



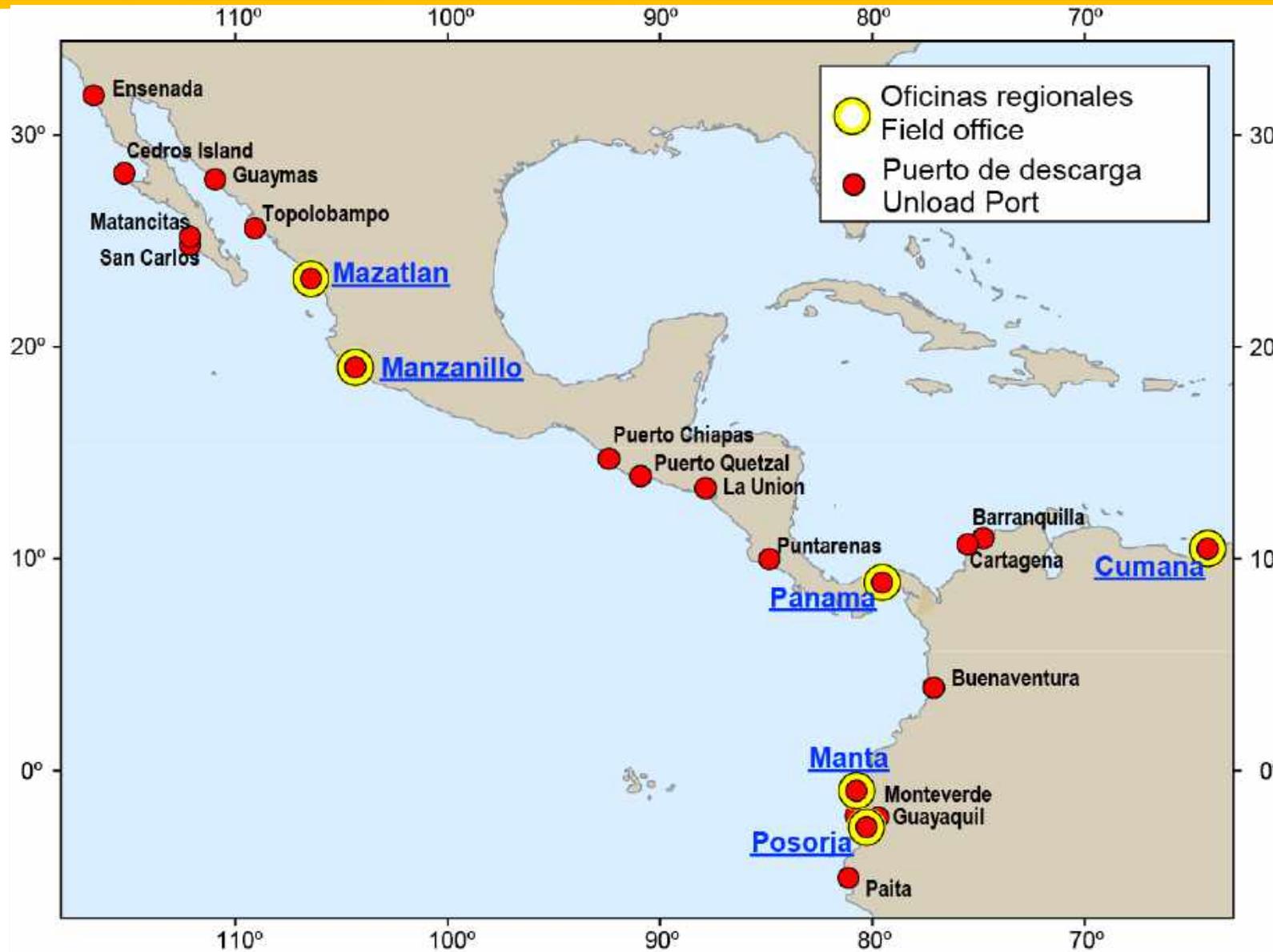
The fisheries: Purse-seine catches of tunas, by species and set type, 2007-2022



Data collection programs

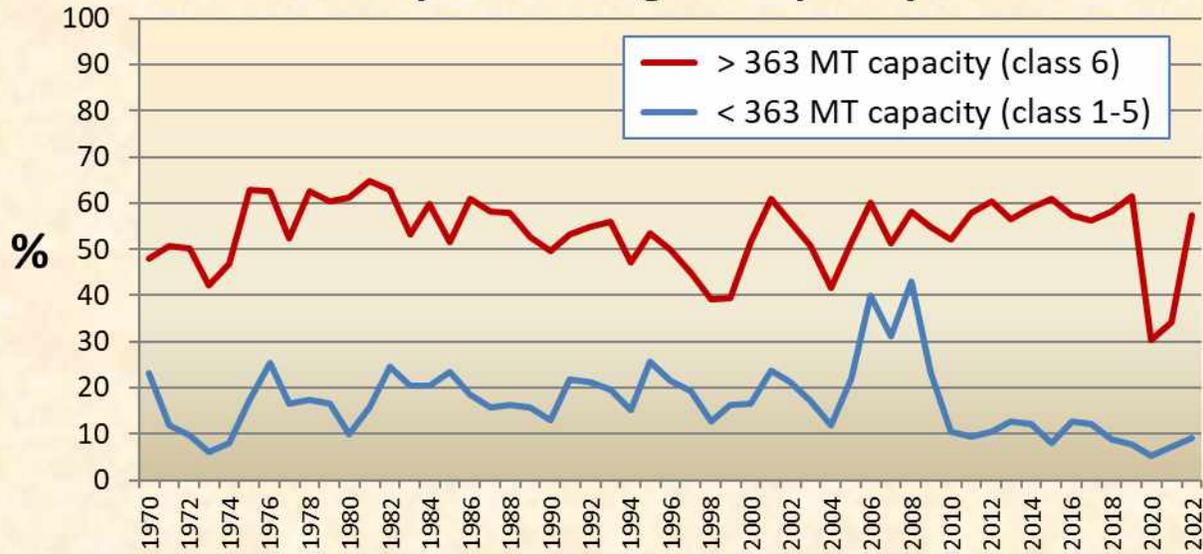
- Purse seine (will expand in later presentations)
 - Cannery/processors
 - Primary source for total fleet catch
 - Logbooks
 - Set-level information
 - Observers
 - 100% coverage of large vessels (class 6)
 - IATTC and member country programs
 - Detailed data on fisheries operation and catch
 - Small, medium, and large size categories
 - At-sea reports
 - Near real-time catch
 - Port sampling
 - Species composition and length composition

CIAT oficinas regionales IATTC field offices

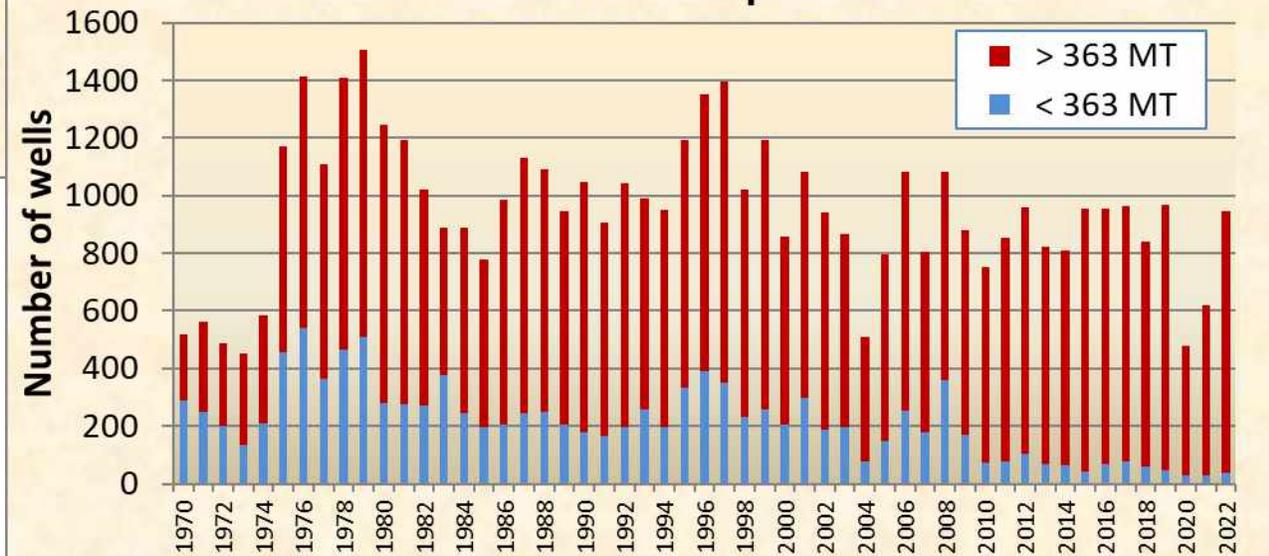


CIAT oficinas regionales IATTC field offices

Percent of trips with Length Frequency: 1970-2022

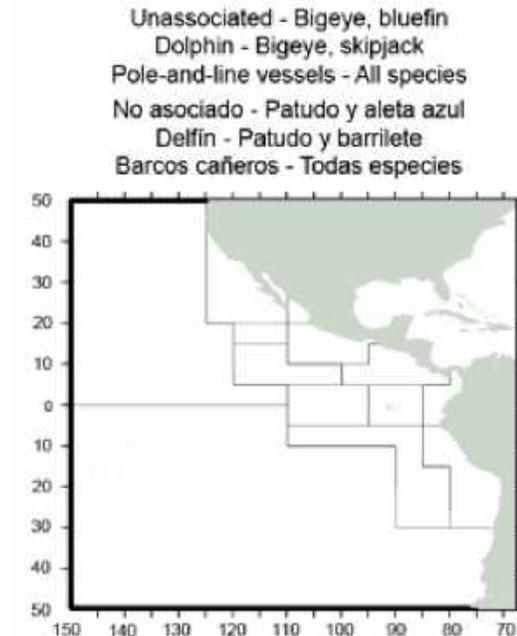
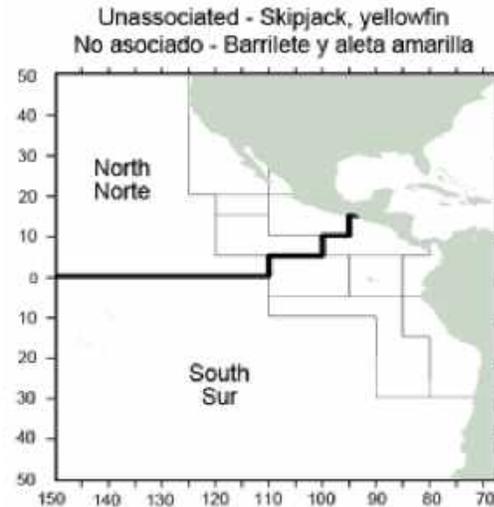
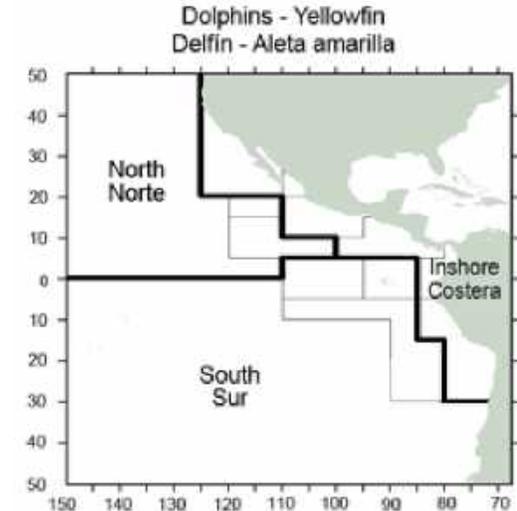
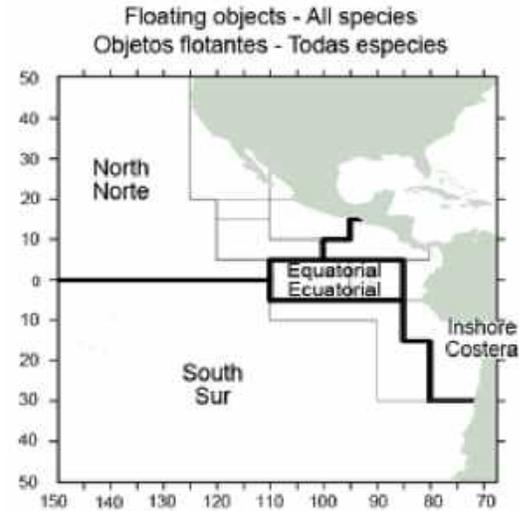
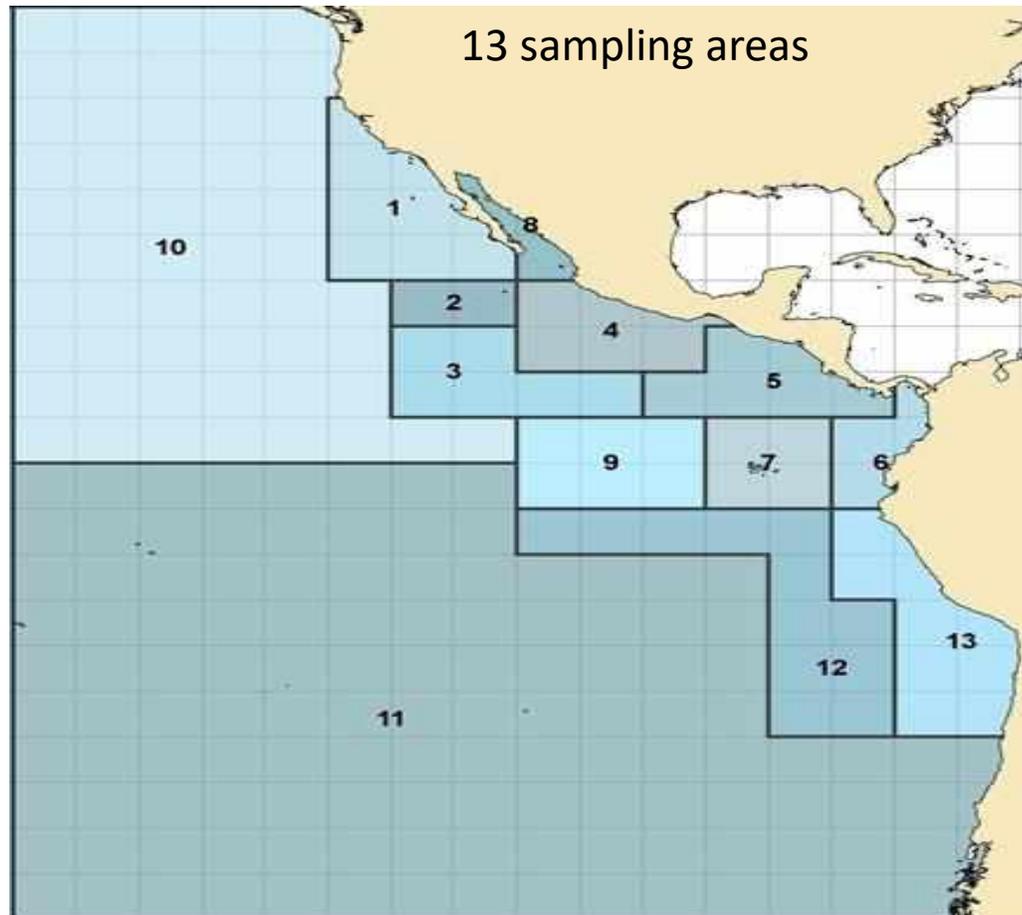


Number of wells sampled: 1970-2022



Áreas históricas de las pesquerías

Historic fisheries areas



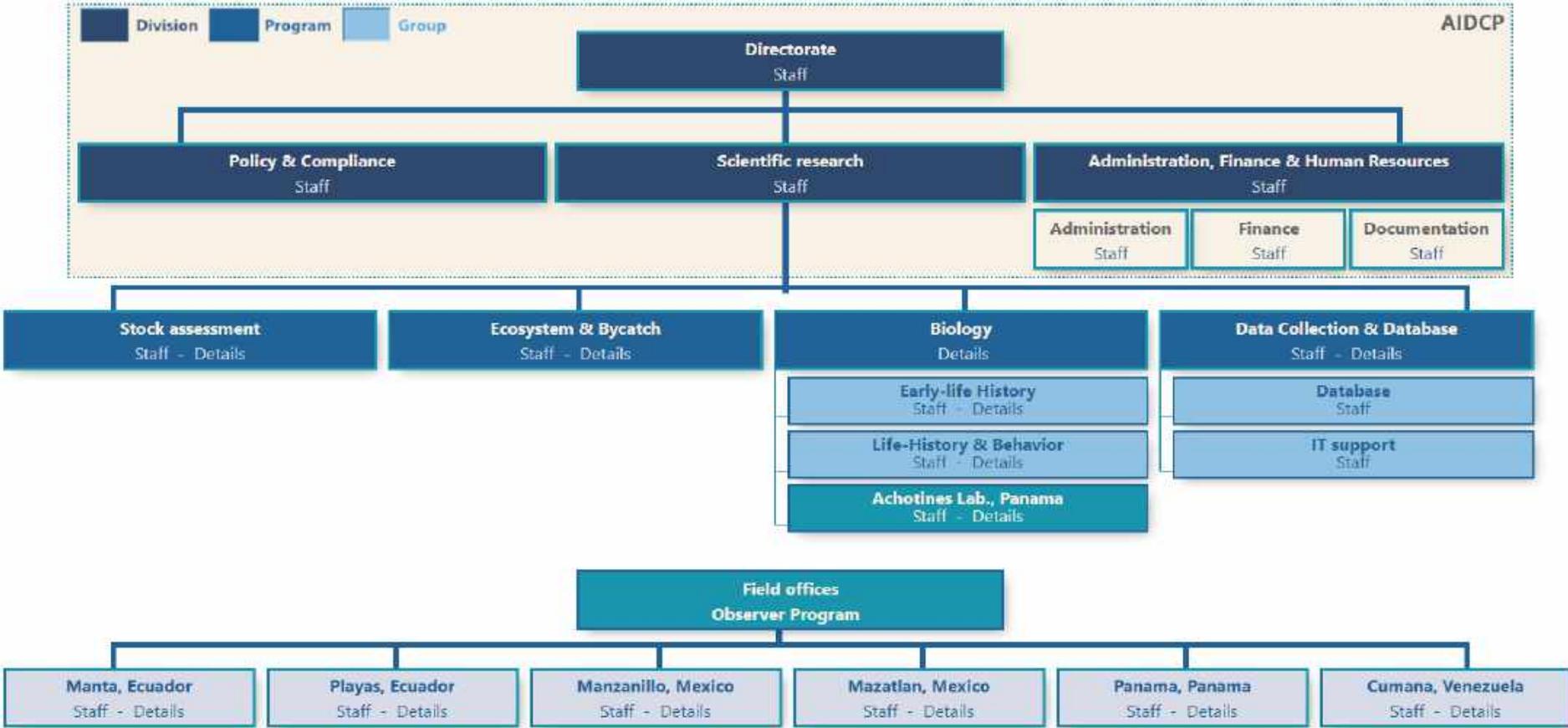
Data collection programs: (longline) Data provision (RESOLUTION C-03-05)

2. The data be provided, by species and fishing gear, where practical, via vessel logbooks and unloading records, and otherwise in aggregated form as in the following table, with Level 3 catch and effort data as a minimum requirement, and, whenever possible, Levels 2 and 1 catch and effort data and length-frequency data.

Category	Level	Resolution	Data
Catch and effort	1	Set-by-set, logbook data with information on gear configuration and target species	Total catch in numbers, and weight if available; fishing effort
	2	1°x1°-month, with information on gear configuration and target species	
	3	5°x5°-month, with information on gear configuration and target species	
Length frequency	1	Set position, start or end of set	Length or weight of individual fish
	2	Grid position, best possible spatial-temporal resolution of area of capture	



Staff



SSP 2019-2023



Recolección de datos en apoyo científico de la ordenación

Data collection for scientific support of management

Estudios del ciclo vital en apoyo científico de la ordenación

Life-history studies for scientific support of management

Pesquerías sostenibles

Sustainable fisheries

Impactos ecológicos de la pesca: evaluación y mitigación

Ecological impacts of fisheries: assessment and mitigation

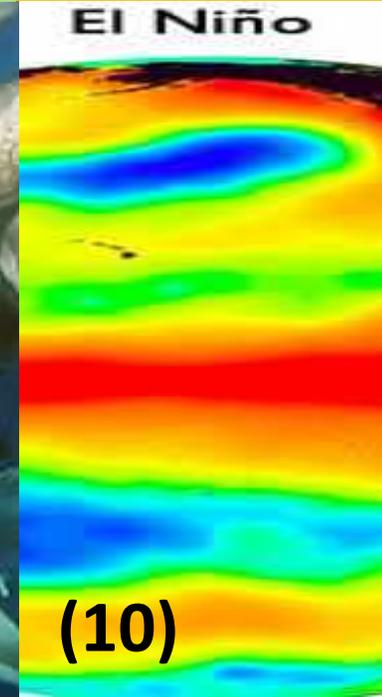
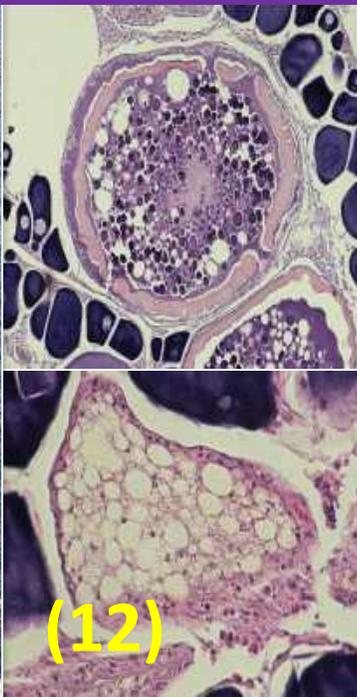
Interacciones entre el medio ambiente, el ecosistema, y la pesca

Interactions among the environment, the ecosystem and fisheries

Transferencia de conocimientos y fomento de capacidad

Knowledge transfer and capacity building

Excelencia científica
Scientific excellence

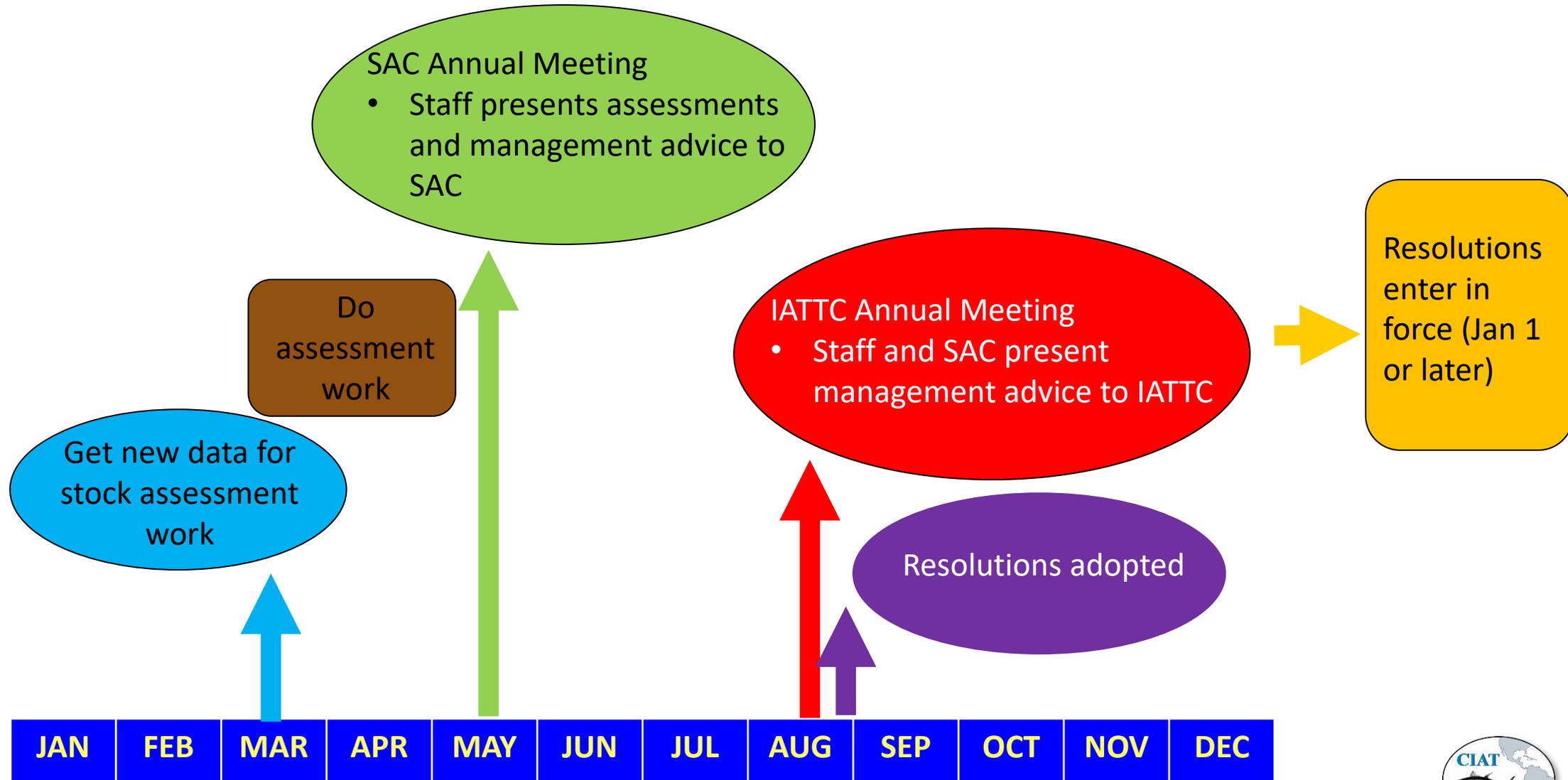


Stock assessments

- Benchmark stock assessments (every 3 years)
 - Investigate model assumptions and improve methodology
 - Decide on the base case methodology / model grid (since 2020)
 - Conduct sensitivity analyses to proposed changes / risk analysis (since 2020)
- Stock status indicators (every year)
- Independent reviews of assessment methods
- IATTC/CAPAM methodology workshop
 - Selectivity, growth, data weighting...



IATTC annual working cycle



Management: Antigua Convention

ARTICLE II. OBJECTIVE

The objective of this Convention is to ensure the long-term conservation and sustainable use of the fish stocks covered by this Convention, in accordance with the relevant rules of international law.

... ensure the long-term **conservation** and **sustainable use** of the fish...

- Maintain or restore the populations of harvested species at levels of abundance which can produce the **Maximum Sustainable Yield (MSY)**
- Apply the **Precautionary Approach**:

“...be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.”



Management: Harvest control rule (RESOLUTION C-16-02)

3. The harvest control rule (HCR) recommended by the scientific staff for the purse-seine fishery for tropical tunas shall be adopted, in accordance with the following principles:
 - a. The scientific recommendations for establishing management measures in the fisheries for tropical tunas, such as closures, which can be established for multiple years, shall attempt to prevent the fishing mortality rate (F) from exceeding the best estimate of the rate corresponding to the maximum sustainable yield (F_{MSY}) for the species that requires the strictest management.
 - b. If the probability that F will exceed the limit reference point (F_{LIMIT}) is greater than 10%, as soon as is practical management measures shall be established that have a probability of at least 50% of reducing F to the target level (F_{MSY}) or less, and a probability of less than 10% that F will exceed F_{LIMIT} .
 - c. If the probability that the spawning biomass (S) is below the limit reference point (S_{LIMIT}) is greater than 10%, as soon as is practical management measures shall be established that have a probability of at least 50% of restoring S to the target level (dynamic S_{MSY}) or greater, and a probability of less than 10% that S will descend to below S_{LIMIT} in a period of two generations of the stock or five years, whichever is greater.
 - d. For fisheries that use gears other than purse-seine nets, the recommendations by the IATTC scientific staff on additional management measures shall be as consistent as possible with those adopted for the purse-seine fishery, while taking account of the impact of those fisheries on the species compared with that of purse-seine fishery.

$$F \leq F_{MSY}$$

$$P(F > F_{LIMIT}) \leq 10\%$$

Rebuild to $P(F \leq F_{MSY}) \geq 50\%$ and
 $P(F > F_{LIMIT}) \leq 10\%$ ASAP

$$P(S < S_{LIMIT}) \leq 10\%$$

Rebuild to $P(S \geq dS_{MSY}) \geq 50\%$ ASAP
And $P(S < S_{LIMIT}) \leq 10\%$ in max(2
generations or 5 years)

Management: Reference points (RESOLUTION C-16-02)

1. For the purposes of this Resolution, the following definitions¹ apply:
 - a. A limit reference point is a conservation reference point based on a level of spawning biomass (S_{LIMIT}) or fishing mortality (F_{LIMIT}) that should be avoided because going beyond it could endanger the sustainability of the stock; $E_{0.5R0}$ and $S_{0.5R0}$ assuming steepness $h = 0.75$ were adopted by the 87th meeting of the IATTC as interim limit reference points for tropical tunas in the EPO.
 - b. A target reference point is a management objective based on a level of spawning biomass (S_{TARGET}) or a fishing mortality rate (F_{TARGET}) that should be achieved and maintained. S_{MSY} and F_{MSY} were adopted by the 87th meeting of the IATTC as interim target reference points for tropical tunas in the EPO.
 - c. Harvest Control Rules (HCRs) are decision rules that aim to achieve the target reference point and avoid the limit reference point by specifying pre-agreed management actions.

Limit reference points:
 $S_{LIMIT} = S(0.5R_0, h=0.75)$
 $F_{LIMIT} = F(S_{LIMIT})$

Target reference points:
 F_{MSY} and S_{MSY}

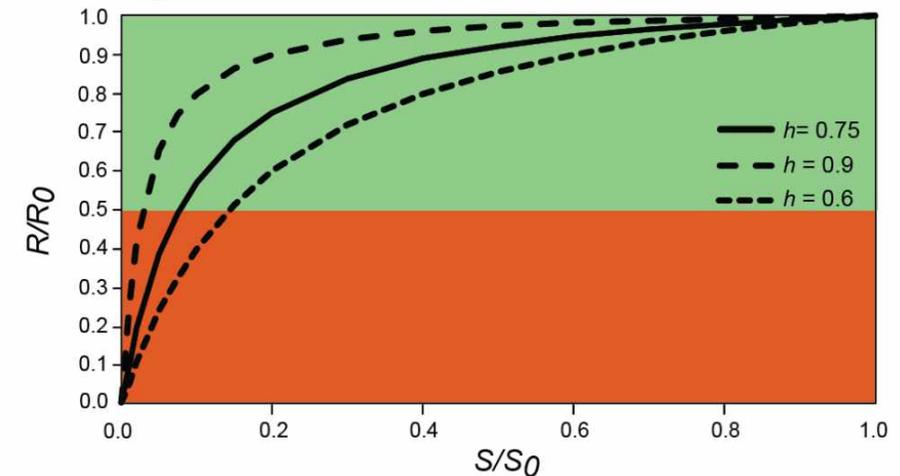


FIGURE 1. The Beverton-Holt stock-recruitment relationship with three different values for steepness (h). The orange area represents recruitment below the LRP definition of $0.5R_0$.

FIGURA 1. La relación población-reclutamiento de Beverton-Holt con tres valores diferentes de inclinación (h). La zona naranja representa reclutamiento inferior a la definición del PRL de $0.5R_0$.

Main management actions

- Limit access to the fishery (purse seine capacity restriction)
- Temporal closure for purse seiners (72 days)
- Spatial closure for purse seiners (“corralito”)
- Longline catch limits
- Dolphin mortality limits (DMLs)
- Others (ban on discards, FAD limits)

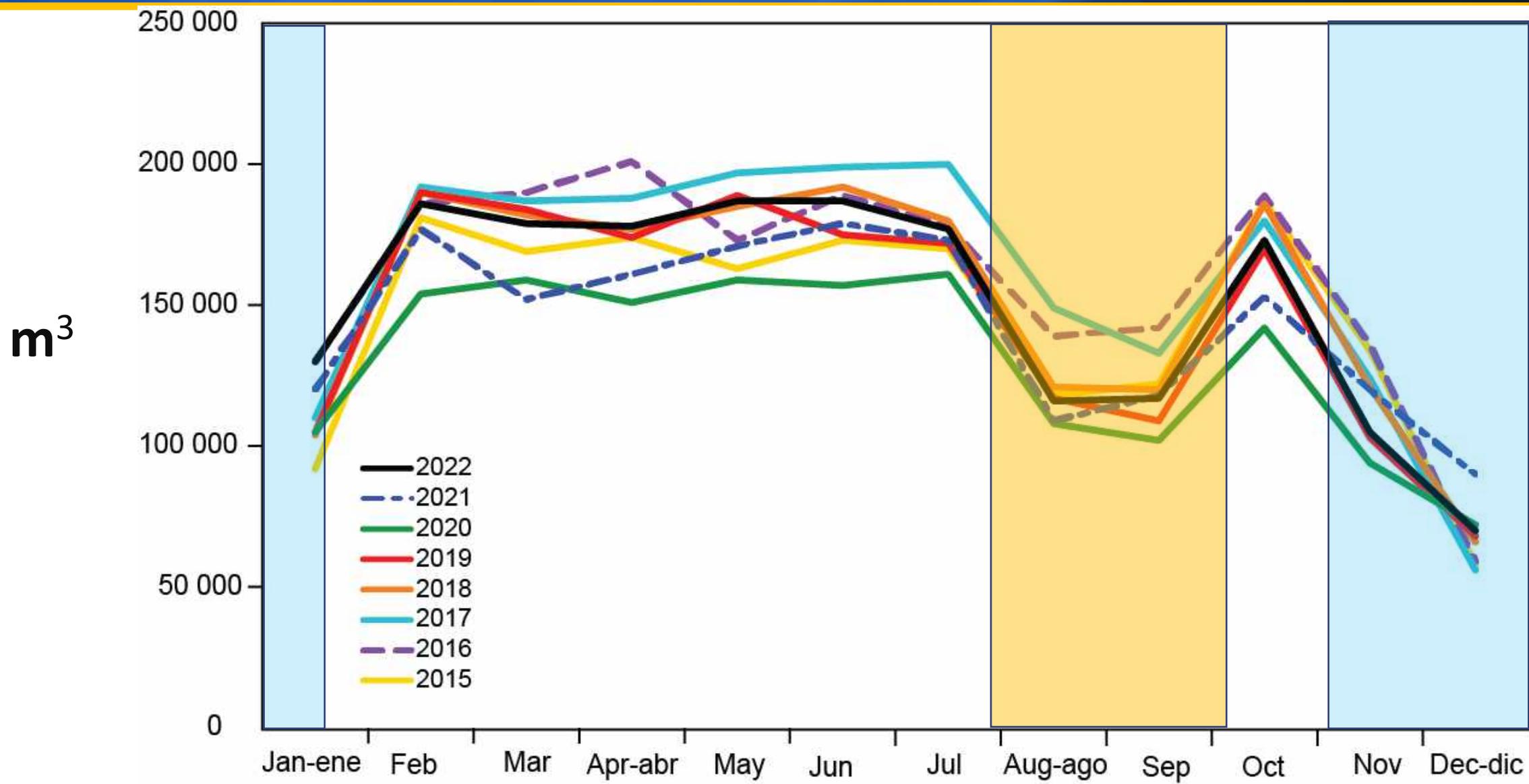
Main management actions

- 72 days (2 periods)

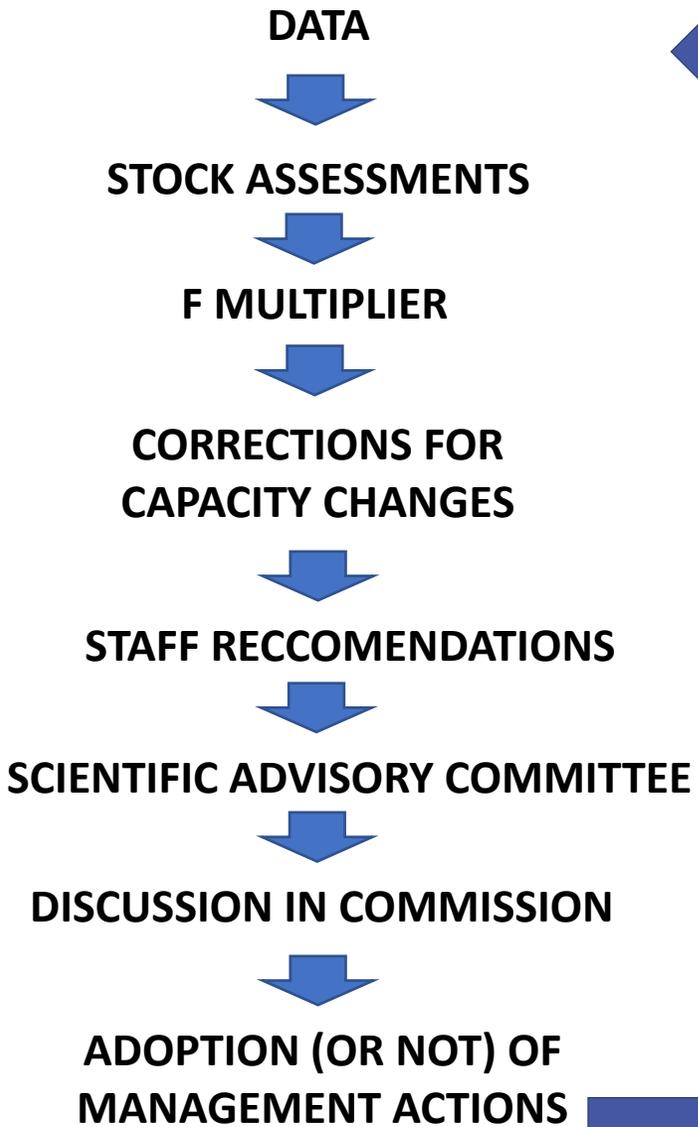


Capacidad promedio (metros cúbicos) de buques cerqueros en el mar en el OPO en 2015-2022 por mes

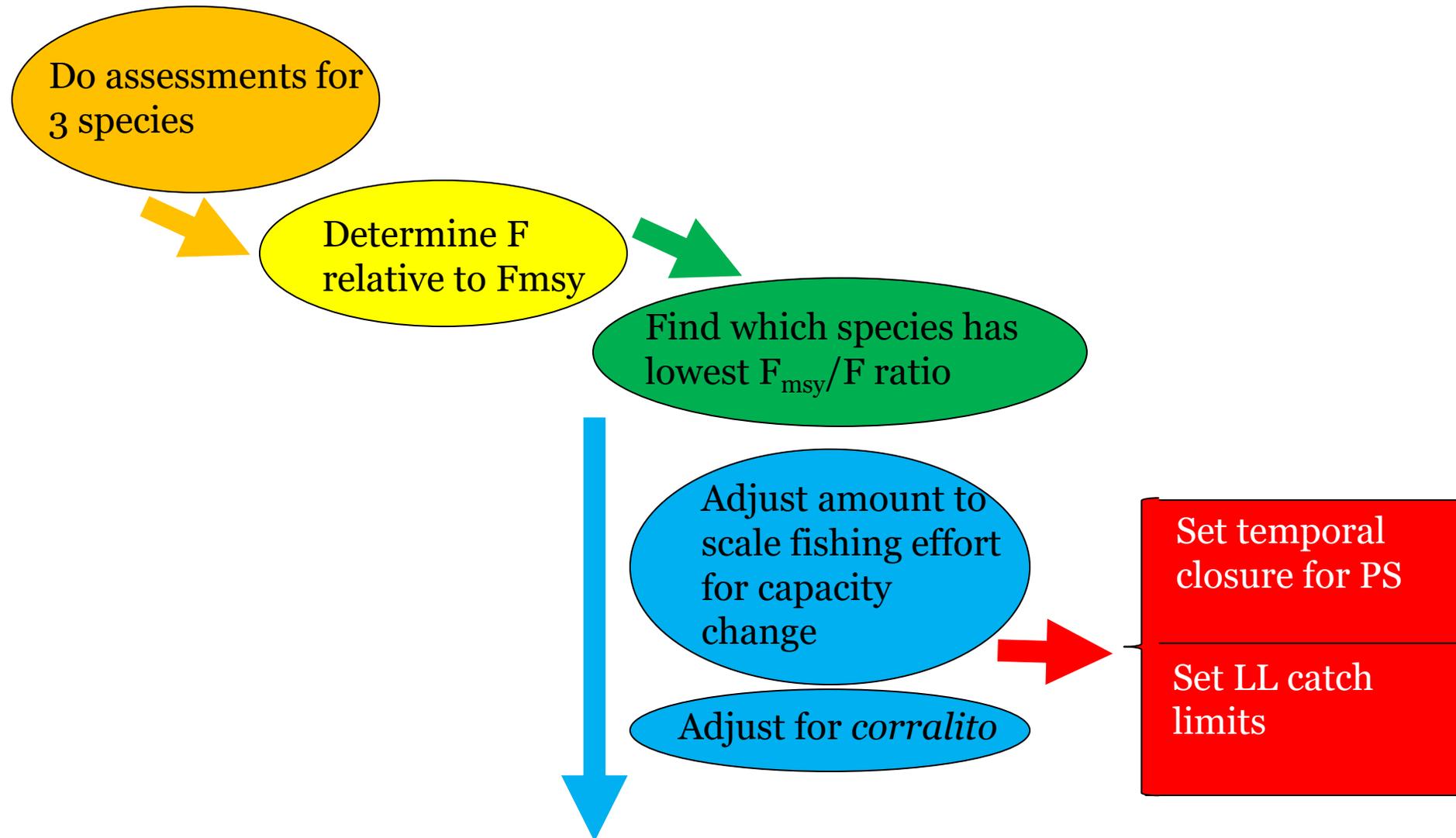
Average capacity (cubic meters) of purse-seine vessels at sea in the EPO in 2015-2022 by month



Management: Process



Assessment and management approach at IATTC

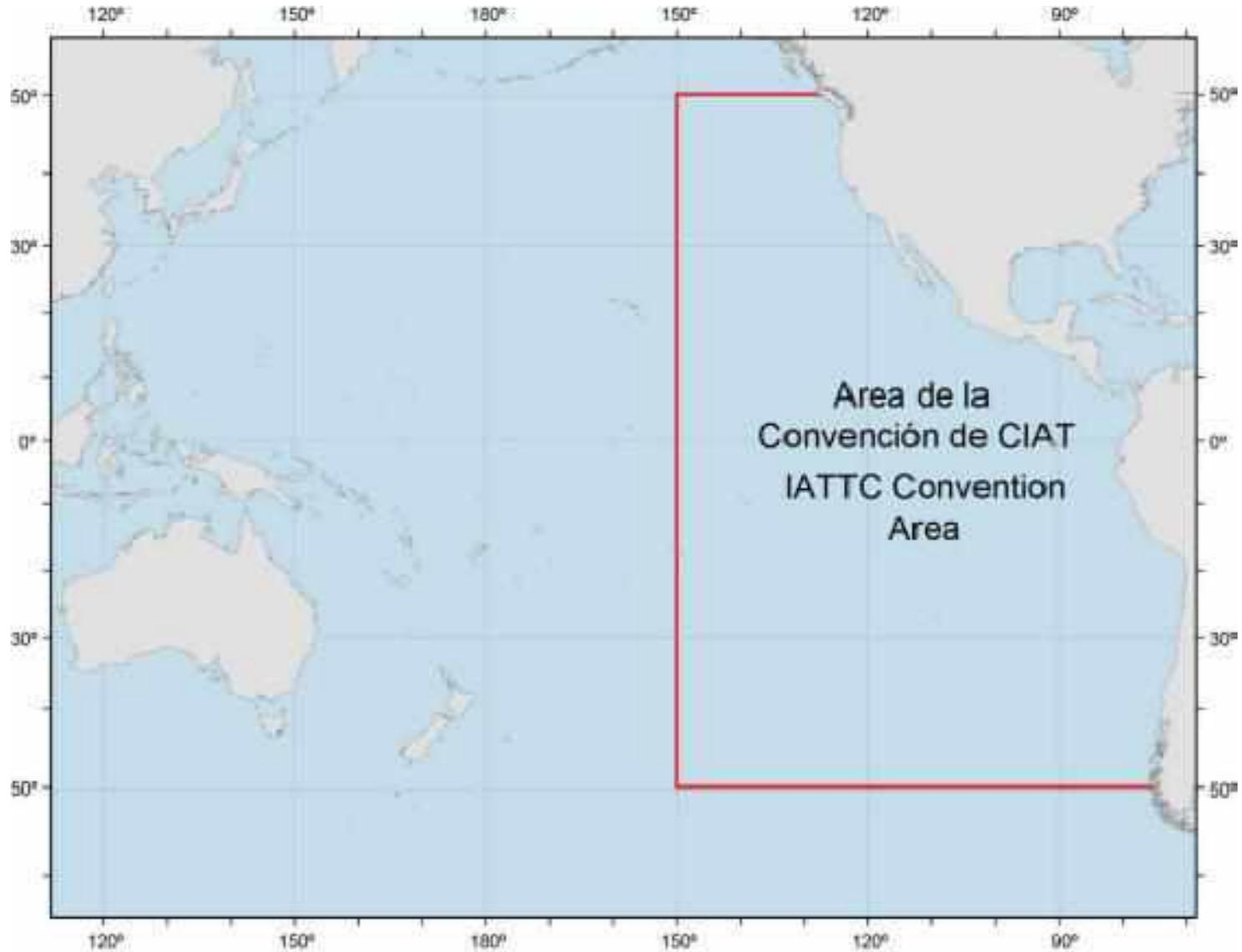




Questions?



IATTC structure: Convention area



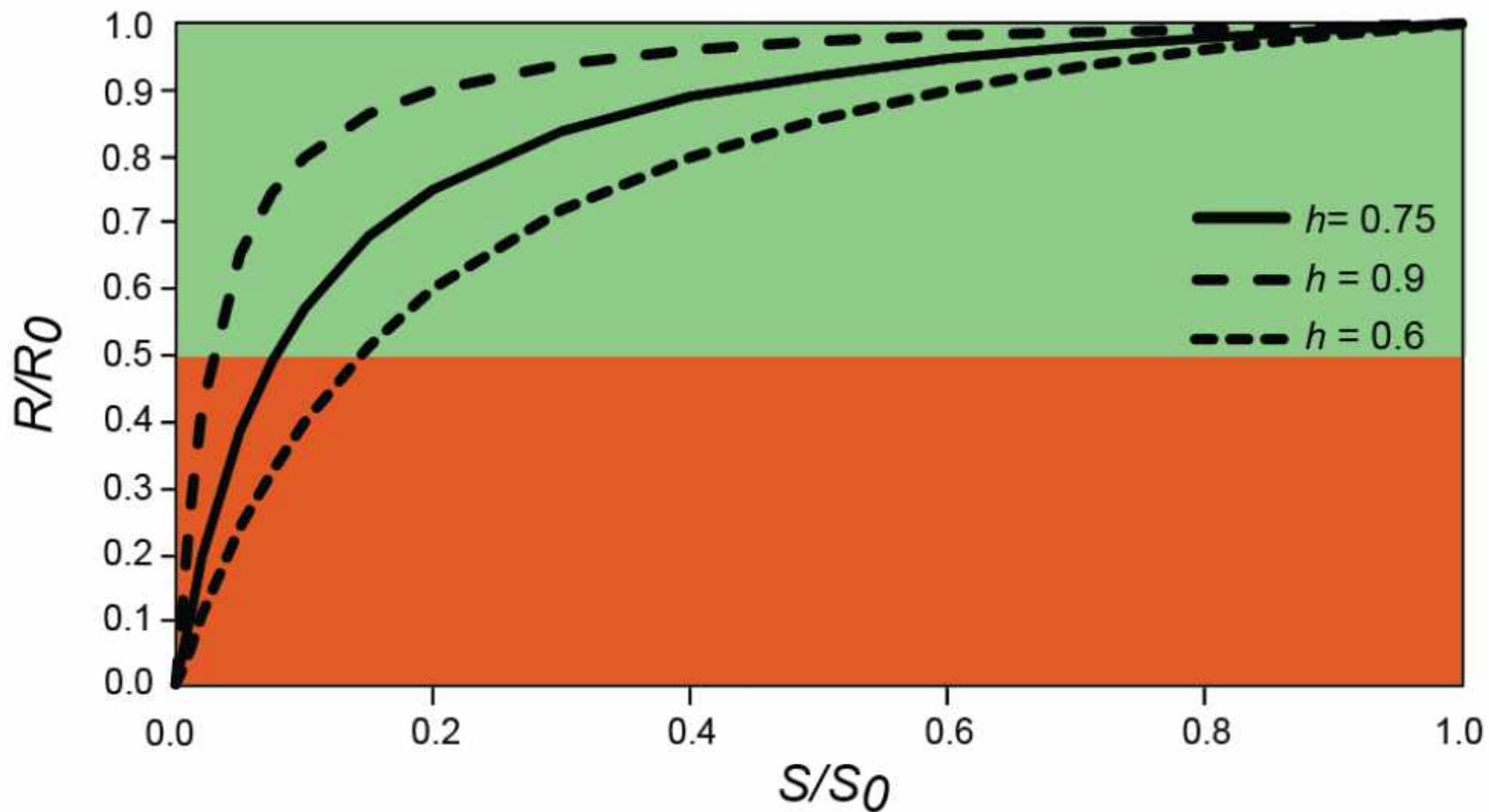


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