



## **PLENARY 08**

*26<sup>th</sup> Meeting of the  
International Scientific Committee for Tuna  
and Tuna-Like Species in the North Pacific Ocean  
Taipei City, Chinese Taipei  
22-29 June 2026*

### **NATIONAL REPORT OF MEXICO (MEXICAN TUNA AND TUNA-LIKE FISHERIES IN THE NORTH PACIFIC OCEAN IN 2024)<sup>1</sup>**

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<sup>1</sup> Prepared for the 26<sup>th</sup> Meeting of the International Scientific committee on Tuna and Tuna-like Species in the North Pacific Ocean (ISC) held June 22-29, 2026, in Taipei City, Chinese Taipei. Document should not be cited without permission of the authors.

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## Summary

This national report describes recent trends in the Mexican tuna fishery for tuna and tuna-like species in the ISC area. In Mexico, the Mexican Institute of Sustainable Fisheries and Aquaculture Research (Instituto Mexicano de Investigación en Pesca y Acuicultura Sustentables, IMIPAS, formerly INAPESCA and INP) was established more than sixty years ago to systematically conduct scientific research on Mexico's marine resources and fisheries. The IMIPAS is responsible of providing the scientific bases for the management advice to the fisheries authorities in México and has established along its coastal states, in both the Pacific and Gulf of Mexico, 14 regional aquaculture and fisheries centers (CRIAPs) which are the centers and laboratories in charge of data collection, sampling, monitoring, and assessment of the main fisheries and aquaculture activities on a regional scale. Since 1992, the IMIPAS has incorporated into this effort the work of the National Tuna-Dolphin Program (Programa Nacional de Aprovechamiento del Atún y Protección del Delfín, PNAAPD of FIDEMAR), which closely monitors and studies the tuna fishery of its purse seine and longline national fleets. The data reported here is based on the combined efforts of these different and unified groups.

## 1 SHARKS

During 2025–2026, Mexican scientists continued their active participation in the Shark Working Group (SHARKWG) of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC), with particular emphasis on the North Pacific blue shark (*Prionace glauca*). The work conducted during this period focused primarily on developing a conceptual model for blue sharks as part of preparatory activities for future stock assessment.

Following the last in-person SHARKWG meeting held in January 2025 in Yokohama, Japan, the Working Group's schedule was modified. Initially, the development of the blue shark conceptual model was expected to be combined with the CPUE standardization meeting planned for March 9–14, 2026. However, budgetary, staffing, and scheduling constraints made it unfeasible to hold such a meeting at the NOAA facilities in La Jolla, California. Due to these circumstances, efforts toward CPUE standardization were postponed, and priority was instead given to developing the blue shark conceptual model. To maintain progress, two one-day virtual meetings were scheduled for May 7 and May 18, 2026, focused exclusively on developing the conceptual model.

On February 3, 2026, the SHARKWG Chair presented the overall plan for developing a blue shark conceptual model. The proposal included several categories, with specific SHWG members assigned responsibility for contributing information relevant to each category. Category leaders were also designated to identify specific aspects or potential issues associated with the information incorporated into the conceptual model. The main categories included Biology and Ecology, Fisheries, and Assessments. Mexico contributed particularly to the fisheries component, including catch, history, regulations, and target-related information, and also participated in broader discussions on biology, ecology, and assessment issues. An online survey was distributed to allow Working Group members to provide references and information for the different categories of the conceptual model. The information was compiled through the “North Pacific Ocean Blue Shark Literature Review Data Collection” form, available at:

<https://docs.google.com/spreadsheets/d/15m6yrXqzmckL55yQ9arRZtWZ6om0nuM-ihfccobyb7c/edit?usp=sharing>.

Mexico's contributions to the literature review included several studies and working documents relevant to blue sharks in the Mexican Pacific. These contributions were submitted as part of the **List of Mexico's Contributions to the North Pacific Ocean Blue Shark Literature Review Data Collection (Responses)**, prepared to support the development of the North Pacific blue shark conceptual model. The information provided by Mexico included peer-reviewed publications, theses, internal IMIPAS reports, cruise reports, and previous ISC working documents related to age and growth, reproduction, movement, trophic ecology, environmental effects, fisheries, catch history, and the legal and institutional framework applicable to shark fisheries in Mexico. The following entries summarize the Mexican contributions included in the literature review.

Blanco-Parra, M.P. et al. (2008). *Age and growth of the blue shark, Prionace glauca* Linnaeus, 1758, in the Northwest coast off Mexico. *Revista de Biología Marina y Oceanografía* 43(3): 513–520. Available at: <https://rbmo.uv.cl/es/978-uncategorised/267-513-520>

### Key findings and summary notes

Sharks in the catches were juveniles of age four ( $134 \pm 13$  cm TL) and age seven ( $174 \pm 21$  cm TL), 19% were males and 22% were females. The von Bertalanffy growth parameters were:  $L_{\infty} = 299.85$  cm TL,  $k = 0.10$  years<sup>-1</sup> and  $t_0 = -2.44$  years for males and  $L_{\infty} = 237.5$  cm TL,  $k = 0.15$  years<sup>-1</sup> and  $t_0 = -2.15$  years for females; differences in growth were found between sexes. Growth parameters were within the range of previous values reported for blue sharks in the Pacific Ocean.

Carrera-Fernández, M. et al. (2010). *Reproductive biology of the blue shark Prionace glauca* (Chondrichthyes: Carcharhinidae) off Baja California Sur, México. *Aqua, International Journal of Ichthyology* 16(3): 101–110. Available at: [http://www.aqua-aquapress.com/pdf/16\(3\)\\_Prionace.pdf](http://www.aqua-aquapress.com/pdf/16(3)_Prionace.pdf)

### Key findings and summary notes

The size at maturity ( $L_{50}$ ) for males was 184 cm total length (TL) and 196 cm TL for females. The litter size ranged from 9 to 64, with a mode of 33 embryos. Ovulation, fertilization, presence of uterine eggs and the smallest embryos were observed in August and September; whereas complete embryos were recorded in May and July, with a gestation period of 9 to 11 months.

Godínez-Padilla, C. et al. (2022). *Marine-climate interactions with the blue shark (Prionace glauca) catches in the western coast of Baja California Peninsula, Mexico*. *Fisheries Oceanography* 31(15). Available at: <https://doi.org/10.1111/fog.12578>

### Key findings and summary notes

Catches were composed mainly by juvenile females (58–199 cm TL) and males (60–179 cm TL). From the exploratory analysis of annual correlations of climate indices with CPUE, the local climate SanDiAs Index explained most variation in CPUE. A generalized additive model (GAM) with 13 predictor variables explained 50.5% of the total blue shark CPUE and 65.5% for juvenile females. The GAM results revealed blue shark CPUE is influenced by five relevant factors: SST, NPGO, year, latitude with distance to coast and quarter interactions, and hooks set. There is a trend to increase or decrease of CPUE when compared with the delay of NEI and SanDiAs indices in more than 1 year. Local and regional climate indices can be successful tools for forecasting blue shark catches in the Northwestern Mexican Pacific.

Polo-Silva, C.J. et al. (2012). *Trophic inferences of blue shark (Prionace glauca) in the Mexican Pacific from stable isotope analysis in teeth*. *Rapid Communications in Mass Spectrometry* 26(14): 1631–1638. Available at: <https://doi.org/10.1002/rcm.6275>

### Key findings and summary notes

Significant differences in  $\delta^{13}C$  values for tooth root were found between immature and mature males, with depleted values of  $^{13}C$  in immature individuals. No statistical differences were found between maturity stages in females for both the C and N isotopes in any part of the tooth, which suggests that females were consuming the same prey in the same area. In addition, we observed significant differences in  $\delta^{15}N$  values between the tooth crown and root. Isotopic analysis in the tooth crown (dentin) and root

may represent a new tool to describe the feeding ecology of different species of elasmobranchs, showing dietary change over a short timescale.

Briones-Mendoza and Armijos-Bravo. (2012). *Edad y crecimiento del tiburón azul Prionace glauca* (Linnaeus, 1758) en la zona del Pacífico ecuatoriano. Universidad Laica Eloy Alfaro de Manabí. Ecuador. Available at: <https://repositorio.ulead.edu.ec/handle/123456789/1481>

#### **Key findings and summary notes**

The estimated growth parameters for the two parameters of the von Bertalanffy model, selected with Akaike from a multimodel approach, were  $L_{inf} = 454$  cm LT,  $k = 0.07$  for females,  $L_{inf} = 418$  cm LT,  $k = 0.08$  for males.

López-López, L.E. (2023). *Estimación de la edad y crecimiento del tiburón azul (Prionace glauca* Linnaeus 1758), en el norte del Pacífico mexicano mediante un enfoque multimodelo. Tesis de Maestría, ICMYL. UNAM. México. Available at: <https://hdl.handle.net/20.500.14330/TES01000835790>

#### **Key findings and summary notes**

The growth parameters, estimated with the three- and two-parameter von Bertalanffy growth models (selected as the best in a multimodel approach), were  $L_{inf} = 236.3$  and  $k = 0.21$  for females. Unreliable growth parameters for the males were obtained.

Castillo-Géniz, J.L. et al. (2024). *Biología reproductiva del tiburón azul, Prionace glauca* (Linnaeus, 1758) que habita las aguas del Pacífico mexicano. IMIPAS. Documento interno inédito. México.

#### **Key findings and summary notes**

The report provides strong empirical evidence on the reproductive biology of the blue shark in the northeastern Pacific, highlighting a biennial reproductive cycle, a sex-balanced population structure, and reproductive parameters consistent with the international literature. Despite limitations in temporal coverage and in the representation of some key reproductive stages, the study generated a robust and highly relevant database for stock assessments and demographic models, particularly for a previously underrepresented region.

Oñate González, E.C. (2008). *Descripción de los movimientos del tiburón azul (Prionace glauca) usando telemetría satelital*. Tesis de Maestría en Ciencias. Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California. xv, 65 hojas. Available at: <https://cicese.repositorioinstitucional.mx/jspui/handle/1007/750>

#### **Key findings and summary notes**

A general trend of southward movements was observed, except on the biggest shark (230 cm TL female) that remained around the tagging area. This difference in behavior could be evidence of sexual segregation known in blue shark. Southward movement can be related with the seasonal movement of cold water masses that move southward during winter and spring along the California and Baja California

Peninsula west coast. A depth preference for depths between 10 to 50 m and less than 5 m was observed. The vertical movement analysis suggests that the blue shark's movements and behavior may be related to prey behavior and the depth of the minimum oxygen level in the water column.

Castillo-Géniz, J.L. et al. (2024). *Prospección y evaluación de recursos pesqueros en el noroeste mexicano: Marcaje de tiburones. Campaña Océano Pacífico 2023, B/I Dr. Jorge Carranza Fraser.* Available at: <https://doi.org/10.64106/acervo.imipas.18>

### **Key findings and summary notes**

The blue shark was the dominant species, confirming its ecological and fisheries importance in the region. Spatial pattern: Higher abundance in central Baja California, decreasing northward where mako increases. Environmental relationships: Catch rates are positively associated with moderate temperatures and higher dissolved oxygen. Decline in catches above ~18°C. Size–environment relationship: Smaller individuals linked to moderate temperatures. Larger individuals associated with warmer (~24°C) and lower salinity waters. Tagging success was high, demonstrating feasibility of offshore tagging campaigns. Low recapture (4 individuals so far), all near tagging sites suggests limited short-term displacement or low reporting rates. Study provides independent fishery data, complementing observer and commercial data sets. Biological samples collected enable future work on age validation, genetics, trophic ecology, and contamination.

Tovar-Ávila, J. et al. (2023). *Prospección y evaluación de recursos pesqueros en el noroeste mexicano: Marcaje de tiburón. Campaña Océano Pacífico 2022, B/I Dr. Jorge Carranza Fraser.* Available at: <https://doi.org/10.64106/acervo.imipas.17>

### **Key findings and summary notes**

Estimated intrinsic population growth rates: Blue shark: median  $r \approx 0.384$  (range: 0.195–0.533) Shortfin mako: median  $r \approx 0.102$  (range: 0.007–0.318) High sensitivity to biological inputs, particularly: Natural mortality (M) Age at maturity Survival rates Elasticity results: Juvenile survival is the dominant driver of population growth in both species Species-specific differences: Blue shark - male maturity age most influential Shortfin mako - female maturity age most influential Model structure insight: Different survival assumptions (e.g., empirical vs theoretical estimators) produce substantially divergent outcomes Synthesis insight: Population productivity estimates for pelagic sharks are highly unstable under parameter uncertainty, reinforcing the need for robust biological inputs.

Furlong-Estrada, E. et al. (2017). *Caracterización de la pesquería de tiburón azul (*Prionace glauca*) en el Pacífico Norte mexicano: un antecedente histórico.* Available at: [https://www.gob.mx/cms/uploads/attachment/file/270430/3\\_Ciencia\\_Pesquera\\_25-1.pdf](https://www.gob.mx/cms/uploads/attachment/file/270430/3_Ciencia_Pesquera_25-1.pdf)

### **Key findings and summary notes**

Significant differences in size composition between fleets: Artisanal fishery targets juveniles (mean ~119 cm TL) Medium-scale fleet captures mostly pre-adults and adults (mean ~177 cm TL) Age structure: Range: ~1–10 years Majority between 2–4 years Growth parameters (Von Bertalanffy):  $L_{\infty}=310.8$ ,  $k=0.16 \text{ year}^{-1}$ ,

t0=-2.15 years. Fishing impact differs by fleet: Artisanal- juveniles, Medium-scale- pre-adults and adults (~64%). Population appears relatively stable, likely due to high productivity (fast growth, high fecundity) However, 61% of sampled individuals were immature, indicating substantial fishing pressure on non-reproductive segments. Blue shark is: A major component of catches (target and bycatch historically) Economically important in the region Study highlights the importance of historical fishery data for improving stock assessments

Yokoi, H., Ijima, H., Ohshimo, S. et al. (2017). *Impact of biology knowledge on the conservation and management of large pelagic sharks*. *Scientific Reports* 7, 10619. Available at: <https://doi.org/10.1038/s41598-017-09427-3>

### **Key findings and summary notes**

Median population growth rates: Blue shark:  $r = 0.384$  (0.195–0.533); Shortfin mako:  $r = 0.102$  (0.007–0.318). High variability in growth rate estimates is driven by biological uncertainty. Key drivers differ by species: Blue shark: male maturity age is most influential. Shortfin mako: female maturity age is most influential. Juvenile survival shows highest elasticity- critical for population dynamics. Survival assumptions (e.g., Hoenig vs Peterson & Wroblewski) strongly affect outputs. Results suggest: Potential underestimation in previous studies (especially for mako). Population growth rates can inform Bayesian stock assessment priors and ERA productivity metrics.

Ramírez-Soberón et al. (2026). *Revisión normativa y administrativa de la pesquería de elasmobranchios en México*. IMIPAS. Documento interno inédito. México.

### **Key findings and summary notes**

Legal and institutional framework applicable to shark fisheries in Mexico; international cooperation with international bodies and instruments applicable to shark regulation.

Sosa-Nishizaki, O., Márquez-Farías, J.F. y Villavicencio-Garayzar, C.J. (2008). *Estudio de caso: Pesquerías de tiburones pelágicos a lo largo de la costa oeste de México*. En *Tiburones del océano abierto* (eds. T.J. Pitcher, M.D. Camhi, E.K. Pikitch y E.A. Babcock). Available at: <https://doi.org/10.1002/9781444302516.ch24>

### **Key findings and summary notes**

SECTIONS: Artisanal fishery, Pelagic longline fishery, Gill-net fisheries, Shrimp trawl bycatch, Fisheries interactions and stock assessment, Regulations.

Fernández-Méndez, J.I. et al. (2025). *Update on standardized catch rates for blue shark (*Prionace glauca*) in the 2006–2022 Mexican Pacific longline fisheries based upon a shark scientific observer program*. Working document submitted to the ISC Shark Working Group Workshop, 27 January–3 February 2025, hybrid meeting. Available at: [https://isc.fra.go.jp/pdf/SHARK/ISC25\\_SHARK\\_1/ISC\\_2025\\_SHARKWG-1-01.pdf](https://isc.fra.go.jp/pdf/SHARK/ISC25_SHARK_1/ISC_2025_SHARKWG-1-01.pdf)

### Key findings and summary notes

A relatively stable trend of the standardized abundance indices from 2006 to 2022 for the Ensenada fleet. For the Mazatlán fleet, the standardized abundance indices show lower levels in the last years of the series (due to target shifting).

Tim Sippel. (2013). *Estimates of Mexico's blue shark catch from 1976–2010*. Available at: [https://isc.fra.go.jp/pdf/SHARK/ISC13\\_SHARK\\_1/04-sippel\\_Mexico\\_BlueShark\\_Catch\\_Estimates%20.pdf](https://isc.fra.go.jp/pdf/SHARK/ISC13_SHARK_1/04-sippel_Mexico_BlueShark_Catch_Estimates%20.pdf)

### Key findings and summary notes

Estimated total Mexican Pacific blue shark catch ranged from 903-4764 mt during 1976-2010. This resulted in blue sharks comprising from 6 -18% of total Mexican shark catch on the Pacific Coast

Sosa-Nishizaki, O. and Castillo-Géniz, J.L. (2016). *Blue shark catches estimations for the Mexican Pacific (1976–2014)*. Working document submitted to the ISC Shark Working Group Workshop, 14–21 November 2016, Haeundae Grand Hotel, Haeundae-gu, Busan, South Korea. Available at: [https://isc.fra.go.jp/pdf/SHARK/ISC16\\_SHARK\\_1/ISC2016-SHARKWG-1-24-Sosa\\_Blue\\_shark\\_catches\\_Mexico\\_1976-2014.pdf](https://isc.fra.go.jp/pdf/SHARK/ISC16_SHARK_1/ISC2016-SHARKWG-1-24-Sosa_Blue_shark_catches_Mexico_1976-2014.pdf)

### Key findings and summary notes

Catches show a constant increasing tendency since 1990, from a level of 1,130 t to 4,469 t in 2010, and reaching a peak in 2014 with 5,502 t. Baja California seems to be the most important landing place for the species, followed by Baja California Sur, however in 2014, Sinaloa became the second most important landing state for blue shark. This general increment is related with the expansion of the fishing grounds from the longline fishery based in Mazatlan, Sinaloa, that fish off Revillagigedo Islands.

Sosa-Nishizaki, O. (2013). *Unofficial blue shark catch estimations for the Mexican Pacific (1976–2011)*. Working document submitted to the ISC Shark Working Group Workshop, 16–24 April, National Research Institute of Far Seas Fisheries, Shizuoka, Japan. Available at: [https://isc.fra.go.jp/pdf/SHARK/ISC13\\_SHARK\\_2/Info1-Unofficial\\_Mexican\\_BS\\_report\\_to\\_ISC\\_SHARKWG.pdf](https://isc.fra.go.jp/pdf/SHARK/ISC13_SHARK_2/Info1-Unofficial_Mexican_BS_report_to_ISC_SHARKWG.pdf)

### Key findings and summary notes

Catches show a constant increasing trend since 1990, from a level of 1,130 t to 4,469 t in 2010, to decrease to 3,719 t in 2011. Baja California seems to be the most important landing place for the species, followed by Baja California Sur.

This compilation provided the basis for the technical discussions held during the first virtual meeting for the 2026 blue shark conceptual model, held on May 7, 2026, in which Mexico participated through Georgina Ramírez-Soberón, José Ignacio Fernández-Méndez, Javier Tovar-Ávila and Luis Vicente González-Ania. The discussion focused on stock structure, reproduction, growth, longevity, movement patterns and alternative hypotheses for the conceptual model. The literature review and the associated Mexican

contributions were used to guide the discussion on regional differences, biological uncertainty, selectivity, and the relative contribution of the eastern North Pacific to the broader conceptual model for blue shark.

### **1.1 STOCK STRUCTURE**

A presentation was given on horizontal movement patterns based on information compiled by the Working Group. The discussion emphasized the need to evaluate whether observed spatial patterns represent true biological structure or are influenced by fishery-dependent sampling, tagging-recovery dynamics, and data availability. In particular, the Working Group discussed evidence of connectivity between the eastern and western Pacific regions, as well as uncertainty about the extent to which movement across regions may support a single-stock hypothesis or alternative spatially structured hypotheses.

Some tagging and genetic evidence was interpreted as supporting a single-stock hypothesis. However, the occurrence of neonates and seasonal timing patterns may suggest at least two pupping areas. The Working Group recognized that available information remains insufficient to quantify the relative contribution of proposed pupping grounds to recruitment. Additional references were identified for incorporation into the conceptual model, including information available at <https://meetings.wcpfc.int/node/19794> and <https://doi.org/10.7554/eLife.62508>

### **1.2. REPRODUCTIVE DISCUSSION**

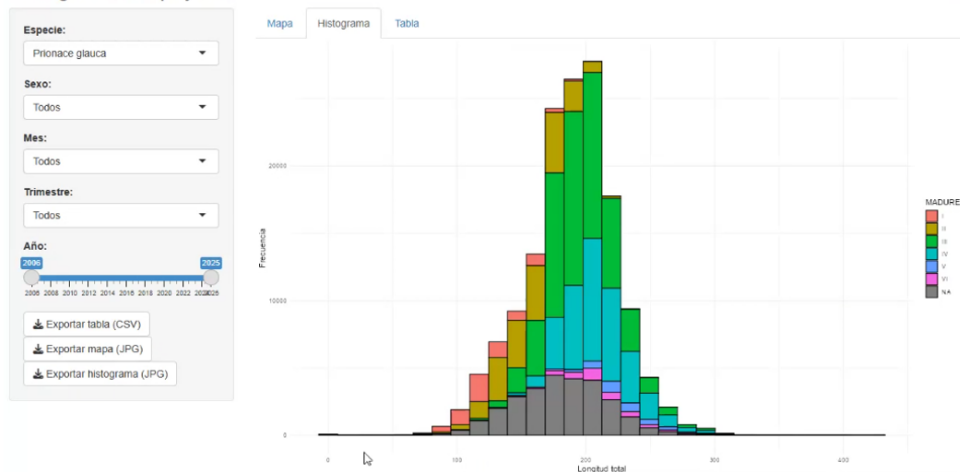
The Working Group discussed potential regional differences in the reproductive cycle of the blue shark. Information from Japan supports an annual reproductive cycle, whereas a Mexican study provides evidence suggesting a possible biennial cycle in the eastern Pacific. However, the Group recognized that data gaps might limit the interpretation of reproductive periodicity. It was therefore suggested that both annual and biennial reproductive-cycle hypotheses could be considered in the development of future assessments, without making a definitive decision at this stage.

The discussion also considered whether differences among regions may be biological or may reflect methodological inconsistencies, sampling limitations, or incomplete temporal coverage. The need to clarify reproductive periodicity was recognized as particularly relevant to future assessment work and potential applications, such as Close-Kin Mark-Recapture approaches. Mexico's reproductive information was considered important because it provides recent empirical evidence from the eastern North Pacific, where biological information remains comparatively limited.

### **1.3. GROWTH & LONGEVITY DISCUSSION**

Upon reviewing Fujinami's et al. (2017) table, a substantial difference was identified in the size range of individuals used in the analysis. Fujinami considered much larger individuals. The methodology applied may also influence the estimates. However, studies that include a broader size range are likely to be more representative. While methodological differences clearly exist, the size range considered in the Natanson study conducted in the Atlantic should also be taken into account. The Mexican delegation was asked to

provide the size range of individuals comprising the blue shark catch. A rapid review of the Observer Program data was conducted to verify the requested information.

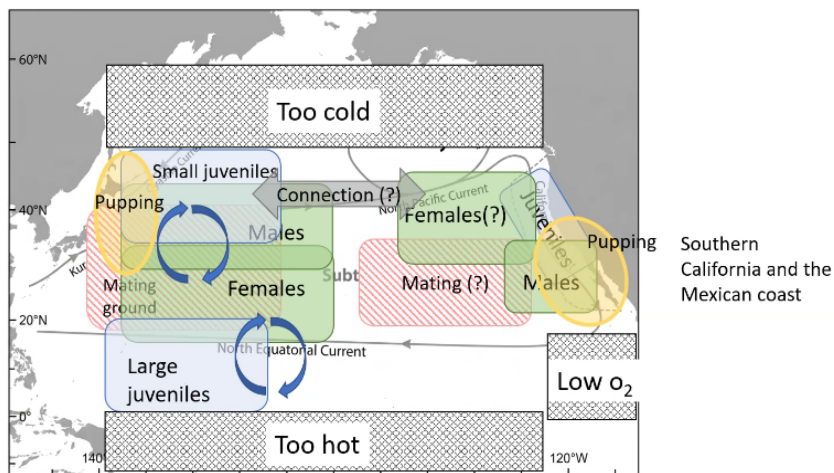


**Figure 1.** A graph shared from the observer data records that Mexico has available: 75-300 cm TL for both sexes. Males appear to be very slightly larger than females.

When the topic of longevity was addressed, given its likely relationship to sample size and the size of the individuals included in the studies, the Mexican delegation explained that studies in Mexico rely heavily on artisanal fisheries. This implies a significant selectivity issue, as fishing gear in these fisheries tends to target or capture smaller individuals. In addition, these are predominantly coastal fisheries, which may affect the representativeness of the samples and, consequently, influence age and growth studies. It was also suggested that observer data could present selectivity issues.

**1.4. DRAFT CONCEPTUAL MODEL DISCUSSION**

Using all the literature information the group had shared, Jhen put together this draft model.



**Figure 2.** Draft model of the blue shark *Prionace glauca*

Using information compiled from the literature review and contributions from Working Group members, a draft conceptual model was presented for discussion. The discussion addressed whether two pupping grounds actually exist, or whether the observed pattern reflects the locations where sampling and observations have been conducted. It was noted that there is a low probability of capturing large sharks in the open ocean using pelagic fishing gear and that longline fisheries generally do not capture neonates.

Japan raised the possibility that information on embryo size in adult females could be used to infer pupping grounds and timing, suggesting that parturition of gravid females may occur farther offshore. However, it remains unclear whether these areas are distinct or whether a central pupping ground exists from which juveniles later disperse toward western coastal regions. Data from the United States and Mexico suggest that pupping areas in the eastern Pacific may be predominantly coastal. Mexico confirmed that juveniles are strongly associated with coastal habitats along the Mexican coast.

Mexico suggested that vertical distribution should be incorporated into the conceptual model, as females may occupy deeper portions of the water column than males, which could explain their apparent absence or underrepresentation in some fisheries catches. Evidence from tagging surveys indicated that large mature females were not captured until longline gear was deployed at greater depths.

Participants emphasized the need to consider selectivity differences among fisheries, given that fisheries-dependent information largely informs current understanding of spatial patterns in size composition and sex distribution for this species

The second virtual meeting for the 2026 blue shark conceptual model was held on May 18, 2026. José Ignacio Fernández-Méndez, Alberto Rodríguez Madrigal, Georgina Ramírez-Soberón, Javier Tovar-Ávila, Luis Vicente González-Ania, and Luis Daniel Carrillo-Colín represented Mexico. The meeting continued the discussion on movement, vertical behavior, and stock structure; the spatial distribution of mature females and males; and implications for future abundance indices and assessment structure.

## **1.5. GENERAL DISCUSSION**

During this second meeting, the Working Group discussed information from tagging studies, including changes in vertical behavior in individuals exhibiting directed movements. It was suggested that the distribution area for mature females in the conceptual model should be expanded farther south, potentially reaching near the equator, whereas the distribution area for males could extend farther north and west. These spatial considerations are relevant for determining the appropriate spatial basis for abundance indices in the eastern Pacific, particularly for adult females.

The issue of connectivity between eastern and western regions was revisited. Conventional tagging information indicated that only a small proportion of tags released in the eastern Pacific were recaptured in the western Pacific, suggesting limited observed exchange. From a stock assessment perspective, it was noted that if movement rates between regions are low, fishing activity in one region may not necessarily have a measurable effect on the other. Nevertheless, uncertainty remains, and the group discussed the possibility of considering multiple stock-structure hypotheses, including a pan-Pacific model, a spatial mixing model, and separate eastern and western regional models.

Participants also discussed possible spatial structuring for future assessment models. Japan suggested that, given the apparently limited connectivity between eastern and western regions, eastern and western substocks may need to be considered. However, it was also recognized that applying a spatial model would require assumptions regarding migration rates, which remain highly uncertain. The United States noted that Stock Synthesis could be configured as a spatial model, although the stock-recruitment relationship would remain pooled across regions; therefore, separate models may also be warranted.

The Working Group further discussed candidate abundance indices and the definition of fishery structure for the next assessment. The Hawaiian shallow-set fishery was identified as a potential index, although concerns were raised about its size composition and sex bias. Japan also described targeting effects in the Japanese shallow-set longline fleet, where the Kesenuma fleet targets swordfish during winter and spring and shifts northward to target blue shark during summer. These examples reinforced the need to carefully consider fleet definitions, seasonality, spatial structure, and target effects when developing abundance indices. A missing reference on Hawaii post-release mortality was also identified and is available at <https://repository.library.noaa.gov/view/noaa/28914>.

Overall, the 2025–2026 activities of the SHARKWG emphasized that the conceptual model for North Pacific blue shark should explicitly incorporate uncertainty in stock structure, movement, reproductive periodicity, pupping areas, vertical distribution, fishery selectivity, regional differences in biological parameters and the spatial basis for candidate abundance indices. Mexico’s participation contributed directly to these discussions by providing information from the Mexican Pacific, including fishery-dependent observer data, biological studies, historical catch estimates, environmental analyses, fishery descriptions, tagging information and national expertise on the eastern North Pacific blue shark fishery.

## **1.6. FUTURE SCHEDULING**

Future work will include further refinement of the blue shark conceptual model and preparation for the data-preparation meeting, expected to be hosted by Japan during the second week of January 2027. It was proposed that the meeting be held from January 12 to January 18. The Working Group indicated that tree-based analyses and additional review of fishery structure may help define spatial and fleet stratification for the next assessment. The key fleets identified for this analysis included the Japanese KK shallow-set fleet, the Taiwanese fleet, and the United States Hawaii longline fleet.

Mexico will continue contributing information from national research programs, observer data, historical catch reconstructions, biological studies, and fishery monitoring activities to support the assessment process and improve scientific understanding of blue sharks in the North Pacific.

## **2 DATA REVISION OF MEXICO FOR 2026 2022**

### **2.1. INTRODUCTION**

The ISC Statistic Working Group (STATWG) requires members of the working groups to present a data revision report to the STATWG upon making a data revision. The Mexican Fisheries Commission (CONAPESCA) is the agency responsible for collecting and managing official catch data. Until recently,

catches for all shark species were grouped under the general categories “Tiburón” (“shark”) and “cazón” (“small shark”, usually referring to individuals below 1.5 m in length, regardless of the species). Only in recent years has species-specific reporting begun, and a consistent, country-wide recording system has yet to be established.

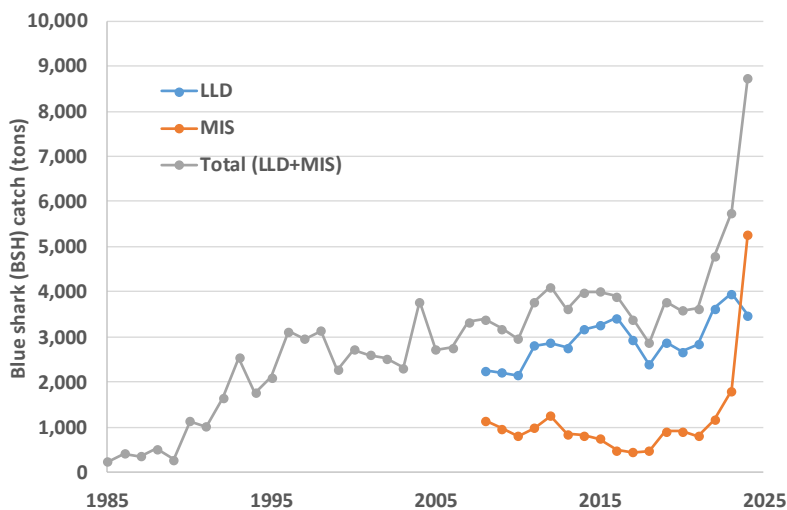
Mexican researchers from IMIPAS and academia have been engaged in recent years in reconstructing historical shark catches for the main species in Mexican fisheries, based on official total and catch data, bibliographic searches of local catch composition data in publicly accessible documents such as scientific articles, theses, unpublished technical reports, conference proceedings, local species identification guides, and faunal lists (Sosa-Nishizaki et al., 2014, 2017; Saldaña-Ruiz et al., 2017). An assessment of the inherent uncertainty in the reconstruction was carried out using methods reported in the literature (Harper et al., 2014; Zeller et al., 2015; CCA, 2019).

## 2.2. DATA REVISION

### 2.2.1. CATEGORY 1

#### Blue shark (BSH)

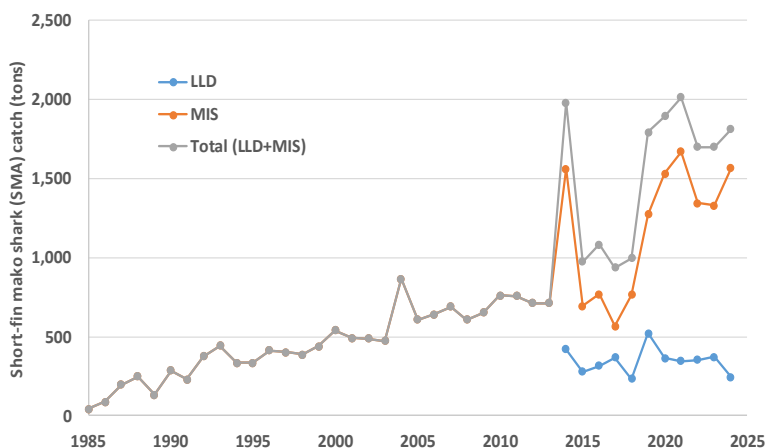
Blue shark (BSH) catches are shown in Figure 3 and Table 1. Catches from 1985 to 2007 come from the reconstruction process mentioned above, and catches from 2008 to 2024 come from official CONAPESCA statistics.



**Figure 3.** Blue shark (BSH) catches from 1985 to 2024 for industrial longline (LLD) and artisanal (MIS) fisheries (1985-2007, reconstructed process; 2008-2024 from official statistics, see text).

## Short-fin mako shark (SMA)

Short-fin mako shark (SMA) catches are shown in Figure 4 and Table 2. As was the case for the blue shark, catches from 1985 to 2007 come from the reconstruction mentioned above, and catches from 2008 to 2024 come from official CONAPESCA statistics.



**Figure 4.** Short-fin mako shark (SMA) catches from 1985 to 2024 for industrial longline (LLD) and artisanal (MIS) fisheries (1985-2007, reconstructed process; 2008-2024 from official statistics, see text).

**Table 1.** Blue shark (BSH) catches from 1985 to 2024 for industrial longline (LLD) and artisanal (MIS) fisheries (1985-2007, reconstructed process; 2008-2024 from official statistics, see text).

	LLD	MIS	Total (LLD+MIS)
1985			228
1986			406
1987			351
1988			509
1989			280
1990			1,130
1991			1,015
1992			1,637
1993			2,540
1994			1,756
1995			2,099
1996			3,117
1997			2,948
1998			3,135
1999			2,262
2000			2,719
2001			2,588
2002			2,523

2003			2,306
2004			3,782
2005			2,721
2006			2,766
2007			3,324
2008	2,244	1,140	3,384
2009	2,204	971	3,175
2010	2,148	806	2,954
2011	2,799	981	3,780
2012	2,864	1,242	4,106
2013	2,764	849	3,613
2014	3,168	813	3,981
2015	3,254	743	3,997
2016	3,411	483	3,894
2017	2,942	442	3,384
2018	2,391	474	2,865
2019	2,873	902	3,775
2020	2,675	901	3,576
2021	2,834	797	3,631
2022	3,620	1,160	4,780
2023	3,960	1,798	5,758
2024	3,471	5,271	8,742

**Table 2.** Short-fin mako shark (SMA) catches from 1985 to 2024 for industrial longline (LLD) and artisanal (MIS) fisheries (1985-2007, reconstructed process; 2008-2024 from official statistics, see text).

	LLD	MIS	Total (LLD+MIS)
1985		42	42
1986		86	86
1987		196	196
1988		247	247
1989		134	134
1990		287	287
1991		228	228
1992		376	376
1993		443	443
1994		335	335
1995		334	334
1996		413	413
1997		401	401
1998		388	388
1999		438	438
2000		539	539
2001		492	492
2002		488	488

2003		472	472
2004		864	864
2005		608	608
2006		640	640
2007		689	689
2008		609	609
2009		652	652
2010		761	761
2011		758	758
2012		714	714
2013		712	712
2014	421	1,560	1,981
2015	280	693	973
2016	315	769	1,084
2017	368	567	935
2018	233	765	998
2019	522	1,273	1,795
2020	363	1,531	1,894
2021	345	1,670	2,015
2022	353	1,346	1,699
2023	371	1,330	1,701
2024	246	1,566	1,812

### 3 TUNAS

In this region, the Mexican fleet concentrates mainly on the yellowfin (YFT) (*Thunnus albacares*), which is the prime target tuna species. The Mexican tuna purse seine fishery is one of the largest in the (ETP) since the mid 1980's. Due to its large volumes, YFT is the main component of Mexico's catch. Other tuna species that are also caught, but contrastingly in lower proportions, are: the skipjack (*Katsuwonus pelamis*) and, for the last 25 years, in northerly zones of the Mexican EEZ, the bluefin (*Thunnus orientalis*), which is targeted by some vessels and, sporadically, the albacore (*Thunnus alalunga*). The fishing operations of the Mexican purse seine fishery comprise a vast area in the EPO, under the IATTC convention area.

The YFT landings of Mexico in 2025 was 194658 mt. That catch set the highest record in this fishery, surpassing the previous record set in 2024. Comparatively, the lowest recorded capture in this fishery during recent years was in the 2006 season, with only 102472 mt., value, which is closer to the 1980's development phase. After 2008, catch levels recovered. The fleet has partially compensated for its catches primarily with skipjack.

These highly consistent reported catches are the result of the combination of the fishing experience and performance of the fleet, as well as the effect of high recruitments in previous years, and are not related to any significant increase in the fishing effort or a greater expansion of its carrying capacity during the corresponding years. Lower catches in 2006 and 2007 are probably related to a decline in yellowfin tuna

population levels (lower recruitment) and excessive catches of juvenile tunas in coastal areas of the EPO. In recent years, catches have increased to new record levels.

The purse seine fleet is subdivided into purse seine vessels, most of them with observers on board all tuna fishing trips, and a small quantity of pole and line vessels (Table 3). The whole fleet is quite stable in number, composition and carrying capacity since the 1990's.

Yellowfin tuna has always been the primary catch, and skipjack is always second in volume. Other tuna species have high values because the fleet has compensated for lower yellowfin catches with other tunas, with skipjack, but a slight increase is also related to Bluefin tuna catches in some particular years (Table 4).

**Table 3.** Size, composition, and carrying capacity of the active Mexican tuna fleet from 2007 to 2025, in EPO

YEAR	No. of active tuna boats	No. of m PSeiners > 400 m3	No. of PSeiners < 400 m3	No. of active Bait Boats
2007	55	42	11	2
2008	49	39	8	2
2009	46	38	6	2
2010	42	36	3	3
2011	43	38	3	2
2012	45	39	3	3
2013	43	37	3	3
2014	47	42	3	2
2015	47	42	3	1
2016	47	42	3	1
2017	51	46	5	0
2018	53	48	5	0
2019	51	46	5	0
2020	48	44	4	0
2021	51	46	5	0
2022	52	47	5	0
2023	53	49	4	0
2024	50	47	3	0
2025	50	47	3	0

**Table 4.** Total tuna catch of YFT, SKJ ALB and PBF by the Mexican fishery (2005-2025)

YEAR	YFT	SKJ	ALB	PBF
2005	113279	32985	0	4542
2006	68644	18655	109	9806

2007	65834	21970	40	4147
2008	85517	21931	10	4407
2009	99157	9310	17	3019
2010	101523	6090	25	7746
2011	102887	8600	0	2731
2012	93686	18259	0	6668
2013	113619	17185	0	3154
2014	120986	8777	0	4862
2015	106188	23497	0	3082
2016	93904	13286	0	2709
2017	80747	21400	0	3643
2018	102000	16700	0	2840
2019	106000	19700	0	2249*
2020	102295	7240	0	3285
2021	108043	7995	0	3027
2022	119555	15609	0	3194
2023	140853	10900	0	3407**
2024	156822	23294	0	3558**
2025	194658	6705	0	6180**

\*This amount includes 245 tons of PBF released alive. This value is preliminary and subject to official validation by CONAPESCA.

\*\*Includes catch of artisanal vessels with longline. These values are preliminary and subject to official validation by CONAPESCA.

### 3.1 BLUEFIN TUNA

All the fishing zones for bluefin tuna used by the Mexican fleet are located on the Northwest side of the Baja California peninsula, within Mexico's Exclusive Economic Zone (EEZ), and have been closer to the ranching locations in recent years. Recorded catches of PBF are registered from March to September, a

time when the transpacific migration of this stock is closer to the Mexican Pacific coast, due to oceanographic factors. Sea conditions, together with the presence of the species, enabled the development of this new fishery, predominantly associated with ranching activities in the northwestern coastal area of Mexico. Temperature is an important factor in determining where PBF is found. The fishing season has shifted from May-June to starting in the first quarter in recent years.

The time series of bluefin tuna captured by Mexico from 2005 to 2025 is presented in Table 4. This represents a small proportion of the Mexican tuna catch, although very valuable. The 3,700 mt. The catch reported in 1996 was the first record for this fishery, and the fleet has targeted first-year bluefin tuna. Again, in 2004 and 2006, new records were established for this tuna species in Mexico. In 2007, the catch returned closer to the average. In 2009, due to the international economic crisis, many companies ceased operations, and catches were below average. In 2010, catches increased again, and since 2012, management measures have been implemented in the IATTC area to limit the PBF catch. The catch in the Eastern Pacific, nevertheless, is below the historic highs observed in the 1960s and 1970s. The information provided makes it clear that bluefin fishing has not been a significant activity in Mexico for many years. It also shows that, even in some fishing seasons, there were no captures of this stock, or that captures were only at low levels. Therefore, it is clear that fishing for bluefin in Mexico was considered only an opportunistic activity. However, for more than 25 years (1996 to the present), there has been greater interest in this species, mainly due to ranching activities in the Northwest region of Mexico.

The catches of Bluefin for ranching are performed only with commercial purse seiners (normally searching for YFT) with a deeper purse seine net. Bluefin tunas are transferred from the purse seine net to “transfer” nets, then to the enclosures and fattening nets located in northern Baja California Peninsula.

In addition, a small artisanal vessel activity caught 18 tons of PBF in 2025, and a US sport fishery that operates in the Mexican EEZ, as reported by the US, and a Mexican sport fishery that caught 4 tons in 2025.

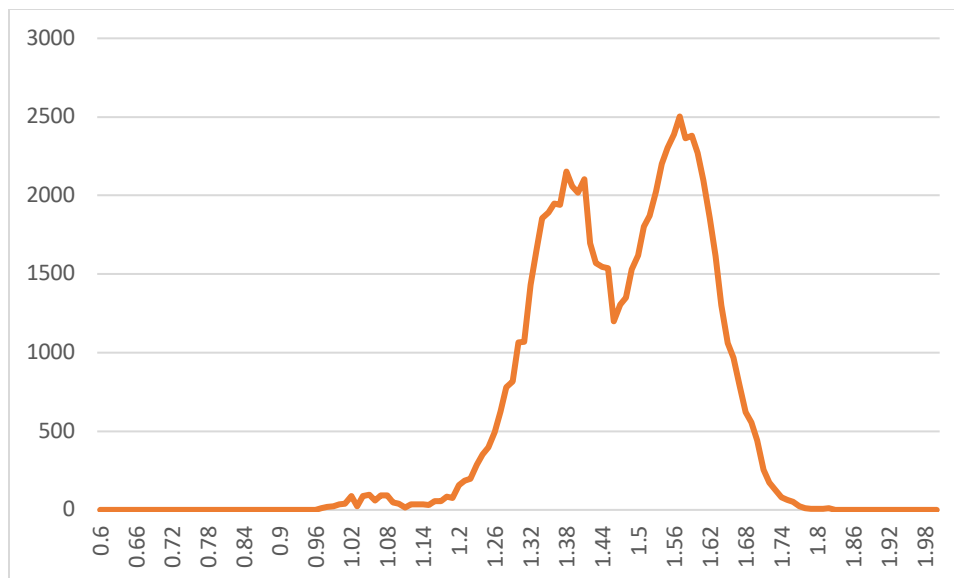
### **3.2 EFFORT**

Only six vessels participated in the PBF catch in 2025, plus eight artisanal vessels.

### **3.3 RANCHING ACTIVITIES**

Ranching activities started in 1996 but fully developed until 2001. Catch before 2012 (quotas implemented since that year) have been variable, making evident that oceanographic conditions and the eastern distribution of the species are limiting factors for the Mexican bluefin fishery.

The size composition of the PBF catch for farming is obtained from stereoscopic cameras that are used during transfer operations. Information is available, used to estimate size composition of the catch and shared with ISC as well as IATTC. Data for 2025 fishery is shown in Figure 5.



**Figure 5.** PBF size composition caught by Mexican purse seiners and transferred to alive pens in 2025

### 3.4 MANAGEMENT

Management of the tuna fishery is done within the framework of the IATTC. For tropical tunas the main aspect of regulation is a time closure and for PBF a Catch quota. The catch of PBF is closely monitored by 100% scientific observer's coverage on board all the fishing activities (both a national and IATTC observer programs). All information is reported and shared between observer programs and based on the quota and catch amount information is reported daily to Mexican authority and IATTC to ensure a quick response from managers and timing of the closure season. All catch is within catch limits established in IATTC resolution C-24-02. Part of the PBF catch limit authorized for Mexico has been cut from the available amount for purse seiners in order to give permits for artisanal vessels. The PBF catch of those vessels is small.

### 3.5 RESEARCH

Some of the research related to tuna and tuna like species can be obtained by contact with authors of documents published in "El Vigia" of the PNAAPD (see [www.fidemar.org](http://www.fidemar.org))

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