Action Item 2.1 Report – Shark Bycatch Outcome & Management Improvement Initiative

Brazil South Atlantic Swordfish - Longline (Hilo) FIP
Action 2 – A.I. (2.1)
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Hilo Fish Company

Purpose:

Review of Brazilian Fleet Impacts on ETP Shark Species and Management Measures for the Brazil South Atlantic Swordfish – Longline (Hilo) Fishery Improvement Project (FIP).

1. Context within the FIP

This report fulfills Action Item 2.1 of the Brazil South Atlantic Swordfish – Longline (Hilo) FIP. It evaluates the impacts of fishing by the Brazilian pelagic longline fleet within the Unit of Assessment (UoA) on Endangered, Threatened, and Protected (ETP) shark species and reviews management measures mandated by Brazil's Ministry of Fisheries and Aquaculture (MPA) and Ministry of Environment and Climate Change (MMA), as well as ICCAT. This document serves to establish a baseline understanding of the status of shark bycatch in the UoA, as to inform future FIP actions to decrease the shark bycatch incidents.

2. Unit of Assessment (UoA)

The Brazilian swordfish longline fishery within this FIP UoA operates in the South Atlantic Ocean, between the latitudes of 12° S and 36° S (Figure 1). The vessels within the UoA land their catches at the ports of Itajaí in Santa Catarina, Itaipava in Espírito Santo, and Rio Grande in Rio Grande do Sul. Larger domestic fishing vessels harvest outside the 200-mile Brazilian EEZ while the smaller vessels fish inside the EEZ.

3. Species Interactions Overview

Brazilian pelagic longline fisheries targeting tunas and swordfish generate substantial shark bycatch, with more than a dozen pelagic shark species routinely captured across the southwestern and equatorial Atlantic. Observer analyses of longline operations conducted between 2004 and 2010, representing more than 21 million hooks, identified blue shark (*Prionace glauca*) as the dominant species in catches, followed by makos, oceanic whitetip, silky, and thresher sharks. Fishing effort was concentrated between approximately 10° N and 30° S and 20° W to 40° W, with heterogeneous catch per unit effort (CPUE) across the region but consistent blue shark occurrence throughout all

fishing areas. Importantly, areas of elevated fishing activity overlapped with biologically important habitats, including nursery zones for species such as oceanic whitetip sharks, indicating increased vulnerability of juvenile life stages to longline mortality (Frédou et al., 2015).

At a broader scale, pelagic longline fisheries account for the majority of global shark mortality, with large-scale fleets responsible for approximately 90% of blue shark catches worldwide. Global estimates indicate at least 189,783 t of blue shark landed annually, with additional discards potentially exceeding 81,000 t, underscoring the magnitude of fishing mortality associated with longline operations and the exposure of shark populations to fishing pressure in Brazilian waters (Poseidon, 2022).

4. Blue Shark Impacts

Blue sharks represent the species most affected by Brazilian pelagic longline fisheries, both as bycatch and increasingly as a retained component of catch. Their wide distribution, high encounter probability with pelagic gear, and overlap with major fishing grounds contribute to elevated capture rates relative to other elasmobranchs (Frédou et al., 2015).

Globally, blue sharks constitute the dominant species in pelagic shark fisheries associated with longline operations. In 2019, minimum landed catch was estimated at approximately 189,783 t live-weight equivalent, corresponding to more than seven million individuals, with additional discards estimated at approximately 81,000 t. Large-scale commercial fleets account for the majority of removals, and the Atlantic Ocean alone represents roughly one-third of global blue shark catch, directly overlapping with Brazilian fishing activity (Poseidon, 2022).

Despite the magnitude of fishing pressure, regulatory responses in Brazil have evolved gradually. Historically considered “predictable bycatch” in surface longline fisheries targeting swordfish, blue shark has recently been reclassified under certain fishing modalities as a managed species subject to quota-based controls aligned with ICCAT allocations per *Interministerial Ordinance MPA/MMA no. 24, of January 29, 2025*. While this approach improves monitoring and accountability, sustained fishing mortality combined with increasing market value, estimated at approximately US $411 million ex-vessel globally in 2019, continues to present conservation risks given the species’ life-history characteristics and extensive exploitation across ocean basins (Poseidon, 2022).

5. Other ETP Shark Species

In addition to blue sharks, the Brazilian pelagic longline fishery interacts with multiple ecologically and trophically important (ETP) shark species of conservation concern. Commonly recorded species include shortfin mako (*Isurus oxyrinchus*), longfin mako (*Isurus paucus*), oceanic whitetip (*Carcharhinus longimanus*), silky shark (*Carcharhinus falciformis*), bigeye thresher (*Alopias superciliosus*), common thresher (*Alopias vulpinus*), and crocodile shark (*Pseudocarcharias kamoharai*). Temporal patterns demonstrate species-specific variability, with some populations exhibiting declines following peak interaction periods, reflecting differences in ecological vulnerability and population status (Frédou et al., 2015).

Spatial overlap between fishing effort and biologically important habitats further increases conservation risk, particularly for species with slow growth, late maturity, and low reproductive output. Such life-history traits reduce resilience to fishing mortality and contribute to the recognized global vulnerability of pelagic sharks interacting with longline fisheries (Frédou et al., 2015).

International analyses also highlight that incomplete taxonomic reporting and limited discard estimates remain significant barriers to effective management of non-target shark species across tuna Regional Fisheries Management Organizations (RFMOs). Improvements in monitoring, observer coverage, and reporting resolution are therefore critical to ensuring that conservation measures benefit not only blue sharks, but also other threatened pelagic species affected by longline fisheries (Poseidon, 2022).

6. ICCAT Management Framework

ICCAT's shark bycatch management framework integrates mandatory reporting requirements, finning prohibitions, species-specific retention bans, and stock rebuilding measures, with compliance evaluated through formal monitoring and review processes. Contracting Parties are required to submit annual Task 1 and Task 2 data, including information on landings, discards, effort, and size composition, and for certain prohibited species must record the number of individuals released with life-status information through observer programs (ICCAT, 2010a).

A central pillar of ICCAT management is the prohibition of finning and the requirement for full utilization. Early measures established fin-to-carcass weight ratios, while more recent policies require sharks to be landed with fins naturally attached, an approach now widely recognized as best practice for improving traceability and compliance (ICCAT, 2004).

ICCAT also implements species-specific retention prohibitions and rebuilding measures for vulnerable taxa commonly encountered in pelagic longline fisheries. Oceanic whitetip, silky, and hammerhead sharks are subject to no-retention requirements, while North Atlantic shortfin mako is managed under rebuilding measures that include mandatory safe-handling and release practices to improve post-release survivability (ICCAT, 2010a; 2010b; 2011; 2021).

The effectiveness of these measures depends on accurate reporting and adequate observer coverage, as data gaps and incomplete discard reporting continue to constrain management outcomes across regional fisheries (Poseidon, 2022).

7. Brazilian National Management Measures

Brazil has developed a regulatory framework governing shark conservation that combines species-specific protections, landing requirements, and management instruments aligned with international obligations. National legislation prohibits capture, retention, landing, storage, and commercialization of species classified as Critically Endangered or Endangered under national listings aligned with IUCN criteria, while Vulnerable species are subject to controlled management measures linked to recovery planning per the *MMA Ordinance No. 445, of December 17, 2014.*

Several pelagic shark species commonly encountered in longline fisheries, including oceanic whitetip and silky sharks, are explicitly protected under national regulations consistent with ICCAT retention bans. Finning is prohibited, sharks must be landed with fins naturally attached, and transfers of sharks or shark products between fishing vessels are prohibited, improving traceability and enforcement.

Brazil's National Plan of Action for Sharks (PAN Sharks) provides a strategic framework for conservation, monitoring, and research priorities. However, regulatory gaps remain regarding quantitative bycatch controls in multispecies fisheries. Aside from a 20% by-weight bycatch limit applicable to associated-school fisheries, Brazil lacks a comprehensive national bycatch cap across fishing modalities, which has historically contributed to ambiguity in retention rules for non-target species in pelagic longline fisheries.

Recent regulatory developments have clarified management for certain species, including blue shark, through quota-based approaches aligned with ICCAT allocations and supported by monitoring systems designed to track landings and compliance as defined in *Interministerial Ordinance MPA/MMA No. 24, Of January 29, 2025*. While these measures strengthen accountability, effective implementation depends on continued improvements in monitoring coverage and enforcement capacity.

8. Findings and Gap Analysis

The Brazilian fleet operating within the Unit of Analysis (UoA) demonstrates measurable interactions with pelagic shark species, particularly blue shark and several ETP species of conservation concern. Management coverage is substantial, incorporating both ICCAT and national measures; however, effectiveness depends on implementation, monitoring, and reporting accuracy. Key gaps remain in bycatch reduction methods, discard reporting resolution, independent verification systems, and standardized release practices.

9. Recommendations for the FIP

1. Implement new gear types & mitigation protocols to reduce shark bycatch onboard fishing vessels.
2. Strengthen vessel-level reporting of shark interactions and discard condition.
3. Implement standardized safe handling and release protocols.
4. Increase observer or electronic monitoring coverage.
5. Provide fisher training programs aligned with MMA regulations.
6. Document compliance with national and ICCAT measures for FisheryProgress reporting.

10. Relevance to MSC Performance Indicators

This action supports MSC Performance Indicators:
- 2.3.1 ETP Outcome
- 2.3.2 ETP Management
- 2.3.3 ETP Information

11. Conclusion

Shark bycatch associated with Brazilian pelagic longline fisheries represents a significant ecological and management challenge due to the diversity of affected species, the scale of fishing effort, and the biological vulnerability of pelagic sharks to fishing mortality. Observer and fleet data demonstrate interactions across extensive areas of the southwestern and equatorial Atlantic, including species of high conservation concern such as oceanic whitetip, silky, mako, and thresher sharks. Spatial overlap between fishing activity and biologically important habitats further increases the risk of population-level impacts.

Brazil has made measurable progress through strengthened conservation measures, including finning prohibitions, fins-naturally-attached landing requirements, species-specific retention bans, and quota-based management aligned with ICCAT frameworks. Nevertheless, challenges remain in monitoring coverage, discard reporting accuracy, and

clarity of bycatch controls in multispecies fisheries. These constraints are consistent with broader challenges identified across tuna RFMOs.

The analyses presented in this report provide a scientifically grounded baseline for advancing shark conservation within the Fishery Improvement Project framework. By integrating fleet interaction data, regulatory context, and international management requirements, the report identifies priority areas for improvement, including physical bycatch reduction methods, enhanced monitoring coverage, improved species-level reporting, adoption of safe handling practices, and strengthened compliance with ICCAT conservation measures.

Implementation of targeted management actions under the FIP, including mitigation measures, fisher training, improved monitoring systems, and collaboration with national authorities and ICCAT, provides a pathway toward measurable reductions in shark bycatch mortality while maintaining the economic viability of the fishery. Continued integration of scientific evidence, regulatory alignment, and stakeholder engagement will be essential for improving conservation outcomes for vulnerable pelagic shark species in Brazilian longline fisheries.

Appendix A: Shark Species and Management Summary

Species	Interaction Level	Management Measures
Blue Shark	High	ICCAT TAC, Brazil Portaria 30/2025
Shortfin Mako	Moderate	ICCAT Rec. 21-09
Oceanic Whitetip	Low	ICCAT Rec. 10-07, Brazil INI 1/2013
Silky Shark	Low	ICCAT Rec. 11-08
Thresher Sharks	Low	General ICCAT shark measures

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