TAI FOONG USA

FISHERY IMPROVEMENT PROJECT

MEXICO GULF OF CALIFORNIA
BROWN SHRIMP - TRAWL

ACTION 2

IMPLEMENT AND ENSURE THE CONTINUITY OF THE FISHERY MONITORING PROGRAM TO ASSESS THE IMPACT OF THE FISHERY ON SECONDARY AND ETP SPECIES

SIX-MONTH ROGRESS REPORT

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Action 2. Implement and ensure the continuity of the fishery monitoring program to assess the impact of the fishery on secondary an ETP species.

This activity is guided by the development of four specific tasks, all of which involve actions to be carried out during the fishing season, particularly through the onboard monitoring program. Implemented for the second consecutive year, this program has observers currently aboard the fleet, collecting data, documenting good practices, and ensuring compliance with the established methodology.

Task 1. Develop and implement an onboard monitoring program of the fishery. (Secondary, and ETP species).

The 2024–2025 onboard monitoring program was successfully completed, concluding last March. This onboard monitoring program recorded data from more than 180 trawl hauls of the shrimp fleet across 11 different fishing zones. Throughout all hauls, there were no interactions with ETP species. In addition, onboard observers verified and confirmed the proper use of the fishing gear, which included the TED device.

Table 1. Number of trawl hauls and fishing zones recorded by the onboard observer program of the shrimp fleet in the Gulf of California during the 2024–2025 season.

Fishing Zone	Number of trawl hauls
BOCA SUR BAHIA DE LOBOS	30
EL CHOYUDO	2
EL CIARIC	12
EL COLORADO	6
EL KIROPO	6
EL MAYO	10
EL TOBARI	8
GUAYMAS	2
MULEGÉ	90
PUNTA ARBOLEA	4
SANTO DOMINGO	16
Total	**186**

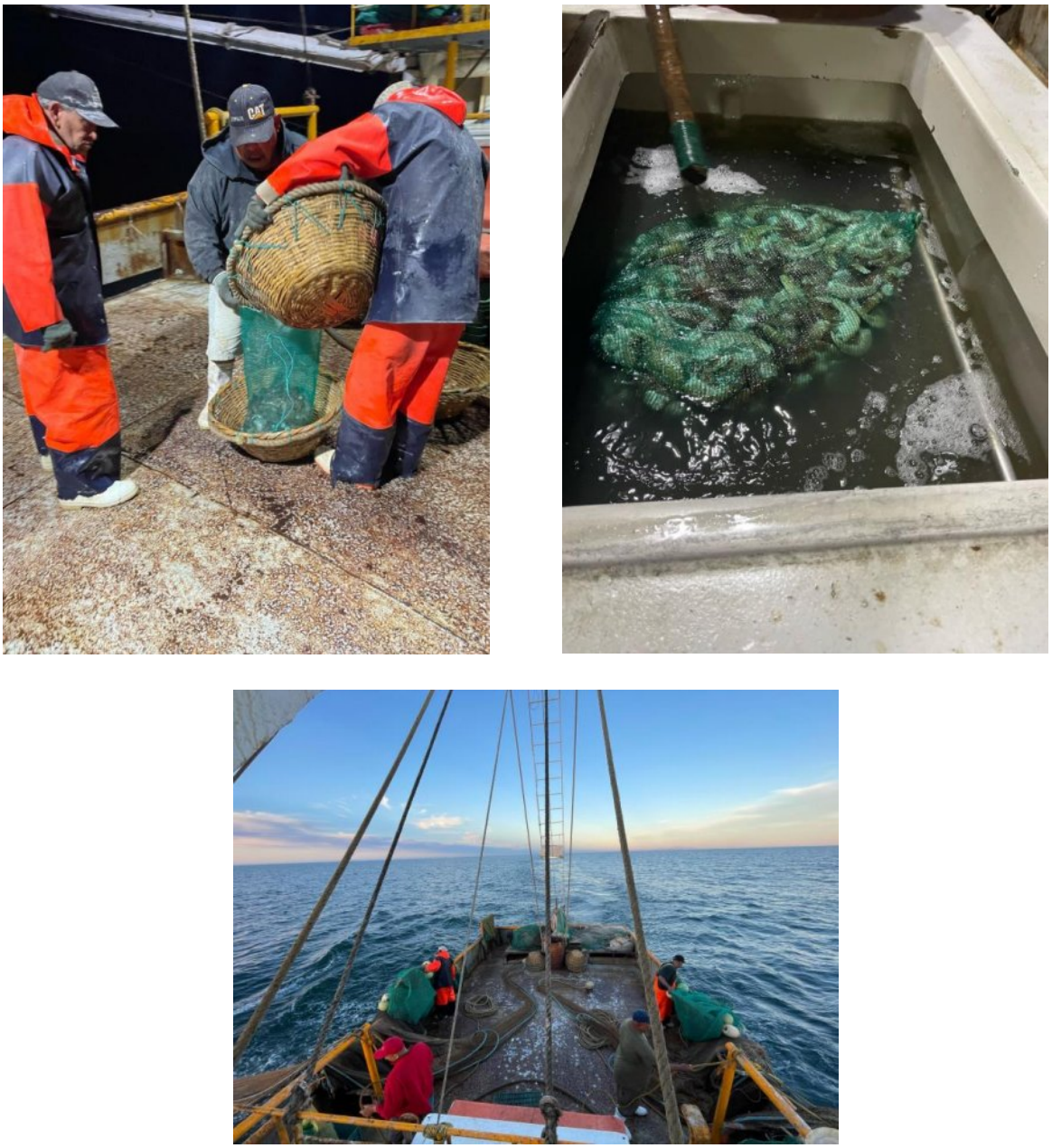

Figure 1. Images taken by onboard observers of the shrimp fleet, documenting good practices and the monitoring protocol of the program.

It is important to highlight that this activity is one of the most significant within the Fishery Improvement Project due to the amount of information it is generating for the fishery. For this reason, efforts will be made to double the coverage of the onboard monitoring program for the 2025–2026 season, which will begin next September. The financial resources for hiring onboard observers have already been secured; the

only remaining step is to wait for the season to start to design the coverage program for the vessels participating in the FIP.

Task 2. Develop a research project to assess the vulnerability of bycatch species (Rays).

The PSA analysis was carried out for the submission of the annual report (February 2025). This report includes the results to date on the assessment of the fishing gear's impact, mainly on rays. The following table shows the occurrence of these species as bycatch in the fishery.

Table 1. Species and their frequency of occurrence in brown shrimp fleet hauls, based on data from the 2024–2025 onboard monitoring program.

Species	Frecuency
Diplobatis ommata	3
Gymnura marmorata	31
Narcine entemedor	2
Raja equatorialis	8
Rhinobatos leucorhynchus	66
Urotrygon chilensis	8
Urotrygon munda	58
Urotrygon rosergi	5
Zapterix xyster	2

To complement the analysis, the results from the 2025–2026 season will be incorporated once it begins, to have two years of sampling and complete the assessment of the impact on ray's trough a PSA.

Based on the current data, ray bycatch is estimated at 0.001%, with 80% of individuals being returned to the sea in accordance with the training and experience of the onboard observers.

Task 3. Gather fishing operation information through logbooks.

Progress continues in compiling information from the fishing logbooks. To date, 92% of the data corresponding to the 2023–2024 season has been processed, although some inconsistencies have been identified and are currently being resolved. These inconsistencies include coordinate adjustments, poor legibility of records, and other factors. In addition, data entry for the 2024–2025 season has already begun, with 21% of the logbooks processed so far.

Table 2. Catch percentage by season from brown shrimp fleet logbooks, Gulf of California

Seasons	**Logbooks**	**% of progress**
Season 2023-2024	92	82%
Season 2024-2025	26	21%

Table 3. Shrimp fleet fishing sites with onboard observers, Gulf of California, two seasons.

Season 2023-2024	Season 2024-2025
El Colorado	Boca Sur Bahía Lobos
Las Calaveras	El Choyudo
Las Guasimas	El Ciriac
San José	El Colorado
Santo Domingo	El Kiropo
	El Mayo
	El Tobari
	Guaymas
	Mulegé
	Punta Arboleda
	Santo Domingo

Task 4. Evaluate the fishery's impact on the ecosystem structure.

To continue analyzing the effects of the fishery on the ecosystem, a specific research line will be developed to implement the Benthic Impact Tool, which will generate a Spatial Impact Atlas and an MSC score for each habitat (Indicator 2.3.1a of the MSC Standard v3.1).

Table 3. Activity Schedule Proposal and Expected Outcomes

Month	Activities	Outputs
1	i. Review of specialized literature ii. Selection of study areas iii. Interviews with fishers and experts	Technical document with validated fishing zone boundaries.
2	i. Collection of fishing effort data ii. Fishing gear characterization	Georeferenced database of fishing effort Technical profiles of the fishing gear
3	i. GIS analysis of benthic habitats ii. Review of associated bycatch	Habitat map Ecological description of benthic fauna
4	i. Parameterization of the Benthic Impact Tool (BIT) model ii. Integration of input data (effort, substrate, gear, fauna)	Interim report on model setup with preliminary simulations
5	i. Analysis of results: Relative Benthic Status (RBS), depletion rates, and recovery rates	Spatial impact atlas MSC score for each habitat (Indicator 2.3.1a of the MSC Standard v3.1)
6	i. Final technical report ii. Draft paper writing	Final report Scientific publication draft

Once this information is obtained, and with the participation of a group of experts using an RBF approach, a Scale Intensity Consequence Analysis (SICA) will be carried out to identify the broader ecosystem impacts of the fishery. Another approach under consideration is the implementation of an Ecopath with Ecosim analysis, through which simulations will be developed to assess the potential

ecosystem effects of different biomass levels of the target species and their eventual impacts on key species within the trophic web.

However, as is well known, both analyses require a substantial amount of input data. For this purpose, information from the 2023–2024, 2024–2025, and 2025–2026 seasons of the onboard monitoring program will be used to support and feed into these analyses.