

# Supplementary Material 1: Estimation of the maximum number of operational buoys

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# 1 Summary

The total number of authorized operational buoys was calculated considering the **large-scale purse seine vessels only**, with data from an International Seafood Sustainability Foundation (ISSF) report (Justel-Rubio and Recio 2023, for ICCAT, IOTC and WCPFC vessels) and data from the IATTC website. This method gives an estimated total maximum number of **237,870** operational buoys at each moment, which is much higher than the last global estimate of DFADs deployments (81,000 to 121,000 deployments in 2013 estimated by Gershman, Nickson, and O’Toole 2015).

# 2 Data

Large-Scale Purse-Seine vessels (LSPS) having  $335 m^3$  fish hold volume or greater were considered (Justel-Rubio and Recio 2023). The number of LSPS vessels considered was based on the Table 5 in Justel-Rubio and Recio (2023) (Figure 1).

	CCSBT	IATTC	ICCAT	IOTC	WCPFC
CCSBT	0				
IATTC		222	19	1	28
ICCAT			108	14	18
IOTC				96	29
WCPFC					326

Figure 1: Table 5 from Justel-Rubio and Recio (2023): Distribution of large-scale tropical purse seine ( $\geq 335m^3 FHV$ ) tRFMO authorizations. Numbers in yellow represent the total number of vessels authorized in the tRFMO (including both vessels authorized by that tRFMO only and vessels authorized also in other tRFMOs).

**IATTC:** The limit on the number of operational buoys in the IATTC depends on the vessel class (IATTC 2021). For that reason, the calculation was performed using IATTC data. The vessel list was downloaded from the following web page on March, the 14<sup>th</sup> 2023 : <https://www.iattc.org/en-US/Management/Vessel-register>.

## 2.1 Calculation

tRFMOs limit the number of operational buoys to 300, 300 and 350 per vessels for the ICCAT (ICCAT 2022), IOTC (IOTC 2019) and WCPFC (WCPFC 2021) respectively.

## 2.2 Results

Table 1: Limit, per tRFMO, of the number of operational buoys when considering only the large-scale purse-seine vessels. Data source: Justel-Rubio and Recio (2023) and IATTC data

tRFMO	Limit on operational buoys
IATTC	62570
ICCAT	32400
IOTC	28800
WCPFC	114100
Total	237870

## References

- Gershman, Dave, Amanda Nickson, and Megan O’Toole. 2015. “Estimating the Use of FADs Around the World.” PEW Charitable Trusts. <http://pew.org/1XUPV4w>.
- IATTC. 2021. “Resolution on the Conservation Measures for Tropical Tunas in the Eastern Pacific Ocean During 2022-2024.” Resolution C-21-04. Inter-American Tropical Tuna Commission. [https://www.iatcc.org/GetAttachment/e3dc0a7e-e73c-4b8e-889e-a4cd2cdd7b8b/C-21-04-Active\\_Tuna-conservation-in-the-EPO-2022-2024.pdf](https://www.iatcc.org/GetAttachment/e3dc0a7e-e73c-4b8e-889e-a4cd2cdd7b8b/C-21-04-Active_Tuna-conservation-in-the-EPO-2022-2024.pdf).
- ICCAT. 2022. “Recommendation by ICCAT Replacing Recommendation 21-01 on a Multiannual Conservation and Management Programme for Tropical Tunas.” Rec 22-01. International Commission for the Conservation of Atlantic Tunas. <https://www.iccat.int/Documents/Recs/compendiopdf-e/2022-01-e.pdf>.
- IOTC. 2019. “Resolution 19/02 - Procedures on a Fish Aggregating Devices (FADs) Management Plan.” <https://www.iotc.org/cmm/resolution-1902-procedures-fish-aggregating-devices-fads-management-plan>.
- Justel-Rubio, Ana, and Lorena Recio. 2023. “A Snapshot of the Large-Scale Tropical Tuna Purse Seine Fishing Fleets as of June 2023 (Version 11).” {ISSF} {Technical} {Report} 2023-04. Pittsburgh, PA, USA: International Seafood Sustainability Foundation.
- WCPFC. 2021. “Conservation and Management Measure for Bigeye, Yellowfin and Skipjack Tuna in the Western and Central Pacific Ocean.” CMM-2021-01. Western; Central Pacific Fisheries Commission. <https://www.wcpfc.int/doc/cmm-2018-01/conservation-and-management-measure-bigeye-yellowfin-and-skipjack-tuna-western-and>.