



Call for Applicants for two PhD bursaries on bycatch and environmental impacts of tropical tuna fisheries in the Eastern Central Atlantic Ocean

Overview

In the context of the recently-funded Horizon Europe [REDUCE project](#), [David M. Kaplan](#), Senior Researcher at the [MARBEC](#) laboratory in Sète, France, and colleagues are happy to announce a call for applicants for two 3-year PhD bursaries on the theme of bycatch and other non-target environmental impacts of tropical tuna purse seine fisheries in the Eastern Central Atlantic Ocean. **Applications are due by January 26, 2024 and should be submitted via [email](#).** Further details are provided below.

Context of the thesis projects

REDUCE project

The [REDUCE \(Reducing bycatch of threatened megafauna in the East Central Atlantic\) project](#), funded by the EU Horizon Europe program for the period 2024-2027 with a total budget of approximately 9 million € and including 13 partners from five different countries (Spain, France, Portugal, Senegal, United Kingdom), aims to promote more sustainable fisheries management and reduce the bycatch of some of the most threatened marine wildlife as a result of European distant-water fisheries active in the Eastern Central Atlantic. Though bycatch and other indirect environmental impacts (e.g., abandoned, lost or discarded fishing

gear - ALDFG) of distant-water fisheries have historically been given relatively less attention than target catch, these impacts threaten a number of emblematic and/or threatened marine megafauna and are increasingly central to discussions and management actions for these fisheries. Integrating researchers with expertise in a variety of fishing fleets/gears (purse seine, longline, pole-and-line, trawling) and taxonomic groups (e.g., tunas, sharks, turtles, sea birds), the REDUCE project will focus on developing and testing new technologies and management strategies for better assessing, monitoring and reducing the bycatch of birds, turtles, cetaceans, sharks and rays by European distant-water fishing fleets.

The REDUCE project is co-led by Professor Jacob González-Solís and Lecturer Manel Gazo of the University of Barcelona. French Institute for Research in Development (IRD) participation in the project is led by Senior Researcher [David M. Kaplan](#) of the Marine Biodiversity, Exploitation & Conservation ([MARBEC](#)) laboratory based in southern France. The IRD budget for the REDUCE project is approximately 700k€.

Tropical tuna purse seine fisheries context

France and Spain have large purse seine fleets in the Atlantic and Indian Oceans that catch more than 100,000 tonnes of tropical tunas per year per ocean. Careful management of these fisheries is essential to their sustainability. In addition to catching target tuna species, these fisheries also catch non-negligible quantities of bycatch, representing between 5% and 15% of the total caught biomass and including some sensitive species such as sharks ([David M. Kaplan and Tolotti 2023](#); [David M. Kaplan et al. 2014](#); [Mannocci et al. 2020](#)). Furthermore, purse seine vessels are increasingly dependent on the use of drifting fish aggregating devices (dFADs), human-made rafts deployed by fishers to aggregate tropical tunas and facilitate their catch, for a large part of their catch ([Floch et al. 2016](#); [Maufroy et al. 2017](#)). These devices are associated with a number of negative environmental impacts, including increased bycatch ([David M. Kaplan et al. 2014](#)), potential for ghost fishing ([Filmalter et al. 2013](#)), coastal stranding events ([Imzilen et al. 2021](#)) and creation of ALDFG ([Imzilen et al. 2022](#)). Both PhD projects are within the overall context of understanding these negative environmental impacts and finding ways to reduce the environmental footprint of European distant-water fisheries in the Eastern Central Atlantic Ocean.

Thesis directors

The two thesis projects will be under the direction of IRD Senior Researcher [David M. Kaplan](#), with potential for co-direction/co-advising from Francis Marsac (IRD), Jacob Solis (UB), David March Morla (UV) and/or Nuno Queiroz (CIBIO-UP).

Host laboratory

The PhDs will be carried out at the [MARBEC](#) laboratory in [Sète, France](#). Students will be enrolled in the [GAIA Doctoral School](#) of the [University of Montpellier](#).



Figure 1: MARBEC Sète Laboratory. [CC BY](#) Stephane Lesbats, Ifremer

Available data

For more than 50 years, the IRD has studied tropical tuna fisheries in the Atlantic and Indian Oceans. This work is currently carried out by MARBEC with data management assured by its pelagic ecosystem observatory ([Ob7](#)). MARBEC activities related to tropical tuna fisheries include fishery data collection and management, scientific research and expert advice to management. Fine scale data managed by the Ob7 on French fishing activities, fishing vessel trajectories, observer data on bycatch and floating object deployments will be available to the PhD projects. In addition, as the REDUCE consortium contains national experts and data managers for the Spanish tropical tuna purse seine fleet and the Spanish and Portuguese longline, pole-and-line and trawler fleets, data from these fisheries may also be made available as needed by project objectives.

Description of PhD projects

The two PhD projects differ in their focuses and methodologies, with the first having a strong field component and being primarily focused on the environmental impacts of the waste generated by the use of dFADs by tropical tuna purse seine vessels, and the second being primarily,

but not exclusively, desk based and focusing on bycatch distributions and species compositions for PS fisheries and other EU distant-water fleets. More details on each project are provided below.

Phd #1: DFAD environmental impacts

This thesis will focus on the following issues using a combination of field work to examine the impacts of dFAD use on coastal habitats and communities and desk-based work on bycatch rates and composition:

- Potential for dFAD ghost fishing via entanglement/netting
- Coastal impacts of DFAD strandings
- Artisanal fisher interactions with dFADs
- Impacts on bycatch quantity and species composition of dFAD set time, soak time and type/structure

PhD #2: Bycatch and marine spatial planning

This thesis will focus on the following issues using a combination of desk-based examinations of observer and logbook data on bycatch rates and species composition and field work to understand shark bycatch drivers:

- Modeling of bycatch distributions using both individual and joint SDMs
- Biological/ecological drivers of bycatch hotspots, including field work to identify reproductive status of shark aggregations
- Impact of time-area closures and/or other forms of marine spatial planning on bycatch of emblematic species

How to apply

Desired qualifications

Appropriate candidates for these PhD projects will have the following skills and qualifications:

- A Masters or equivalent degree in marine science, fisheries science or a related discipline
- A positive work ethic, capacity for independently advancing project goals and a strong intellectual curiosity
- Ability to work collaboratively both within the MARBEC laboratory team and the REDUCE international consortium

- Sufficient proficiency in scientific English to work in a multi-lingual environment and write scientific publications
- Some previous experience using computational tools potentially relevant to the projects, such as R, Python, SQL databases, statistical models, species distribution models, etc.
- Previous experience with tropical tuna fisheries and/or environmental impacts of fisheries will be considered a plus

Application materials

Applications should be emailed to David M. Kaplan, preferably using this [link](#). In the text of the email, as well as the attached letter of motivation, please indicate which of the two PhD projects interests you. Also indicate whether you would prefer doing an eventual interview for the position in French or if you could do the interview in English. Please attach to the email PDF file(s) containing:

- 1) A full CV
- 2) Transcripts from your most recent graduate or undergraduate studies including if possible your class ranking
- 3) A letter of motivation. The letter should clearly indicate which of the two PhD projects you are applying for and include the names and contact information for 2-4 professional references who can vouch for your aptness for the proposed projects.

Application materials should be sent no latter than **January 26, 2024**.

Selection process

Applications will be given an initial review by a small selection committee consisting of the thesis directors and several other REDUCE project members. A short list of candidates will be invited to an interview to be conducted via video conference consisting of a short presentation of the candidate's CV and interest in the PhD project followed by questions from the selection committee. Final selection of the students for each PhD bursary will be made 1-3 weeks after the interview.

Cited references

Filmalter, John David, Manuela Capello, Jean-Louis Deneubourg, Paul Denfer Cowley, and Laurent Dagorn. 2013. "Looking Behind the Curtain: Quantifying Massive Shark Mortality in Fish Aggregating Devices." *Frontiers in Ecology and the Environment* 11 (6): 291–96. <https://doi.org/10.1890/130045>.

- Floch, Laurent, Patrice Dewals, Dominique Irié, Pascal Cauquil, Daniel Gaertner, Pierre Chavance, Alexandra Maufroy, and Emmanuel Chassot. 2016. “Statistics of the French Purse Seine Fishing Fleet Targeting Tropical Tunas in the Atlantic Ocean (1991-2014).” *Collect. Vol. Sci. Pap. ICCAT* 72 (3): 577–99.
- Imzilen, Taha, Christophe Lett, Emmanuel Chassot, and David M. Kaplan. 2021. “Spatial Management Can Significantly Reduce dFAD Beachings in Indian and Atlantic Ocean Tropical Tuna Purse Seine Fisheries.” *Biological Conservation* 254 (February): 108939. <https://doi.org/10.1016/j.biocon.2020.108939>.
- Imzilen, Taha, Christophe Lett, Emmanuel Chassot, Alexandra Maufroy, Michel Goujon, and David M. Kaplan. 2022. “Recovery at Sea of Abandoned, Lost or Discarded Drifting Fish Aggregating Devices.” *Nature Sustainability* 5 (April): 593–602. <https://doi.org/10.1038/s41893-022-00883-y>.
- Kaplan, David M., Emmanuel Chassot, Justin M. Amandé, Sibylle Dueri, Hervé Demarcq, Laurent Dagorn, and Alain Fonteneau. 2014. “Spatial Management of Indian Ocean Tropical Tuna Fisheries: Potential and Perspectives.” *ICES Journal of Marine Science* 71 (7): 1728–49. <https://doi.org/10.1093/icesjms/fst233>.
- Kaplan, David M, and Mariana Travassos Tolotti. 2023. “Silky Shark Abundance Index Based on CPUE Standardization of French Indian Ocean Tropical Tuna Purse Seine Observer Bycatch Data.” IOTC-2023-WPEB19-34_Rev1. Réunion, France: IOTC 19th Working Party on Ecosystem and Bycatch.
- Mannocci, Laura, Fabien Forget, Mariana Travassos Tolotti, Pascal Bach, Nicolas Bez, Hervé Demarcq, David Kaplan, et al. 2020. “Predicting Bycatch Hotspots in Tropical Tuna Purse Seine Fisheries at the Basin Scale.” *Global Ecology and Conservation* 24 (December): e01393. <https://doi.org/10.1016/j.gecco.2020.e01393>.
- Maufroy, Alexandra, David M. Kaplan, Nicolas Bez, De Molina, Alicia Delgado, Hilario Murua, Laurent Floch, and Emmanuel Chassot. 2017. “Massive Increase in the Use of Drifting Fish Aggregating Devices (dFADs) by Tropical Tuna Purse Seine Fisheries in the Atlantic and Indian Oceans.” *ICES Journal of Marine Science* 74 (1): 215–25. <https://doi.org/10.1093/icesjms/fsw175>.