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**Modelling the oceanic habitats of Silky shark (Carcharhinus falciformis), implications for conservation and management**

**Authors:** Jon Lopez, Diego Alvarez-Berastegui, Maria Soto, Hilario Murua

**Abstract**

Investigating the relationship between abundance and environmental conditions is of primary importance for the correct management of marine species, especially for highly migratory pelagic species like silky sharks (Carcharhinus falciformis), a species that is currently ranked by the IUCN as near threatened or vulnerable, depending on the region. Tropical tuna purse seine vessels annually deploy thousands of drifting fish aggregating devices (FADs) to facilitate their catch of tuna. However, the use of these devices increases the by-catch rate, along with other potential impacts on the ecosystem. This work provides first insights into the environmental preferences of silky sharks by modelling their abundance with a set of biotic and abiotic oceanographic factors, spatial-temporal terms and fishing operation variables. We used Spanish observer data from 2003 to 2015, corresponding to ~7500 fishing sets for the Atlantic Ocean. Oceanographic data (SST, SST gradient, salinity, SSH, CHL, CHL gradient, oxygen, and current information such as speed, direction and kinetic energy) were downloaded and processed for the study period and area from the MyOcean-Copernicus EU consortium. Results provide information on the dynamics and hotspots of silky shark abundances as well as the most significant habitat preferences and drivers of the species. Models detected a significant relationship between seasonal upwelling events, mesoscale features and shark abundance and suggested strong movement and interaction between productive systems and the spatial-temporal dynamics of sharks. This information could be used to assist tuna-RFMOs in the conservation and dynamic management of this vulnerable non-target species.

**Keywords:** sharks, habitat modelling, dynamic ocean management, bycatch mitigation, tuna fishery, FADs, environmental drivers, regime shift identification

**Contact author:** Jon Lopez PhD, AZTI Foundation, email: jlopez@azti.es , Tel: +34 634 209 738