Large Marine Ecosystems such as the Canary Current system off West Africa sustain high abundance of small pelagic prey, which attracts marine predators. Seabirds are top predators often used as biodiversity surrogates and sentinel species of the marine ecosystem health, thus frequently informing marine conservation planning. This study presents the first data on the spatial (GPS-loggers) and trophic (stable isotope analysis) ecology of a tropical seabird – the endangered Cape Verde shearwater Calonectris edwardsii. This information is related with marine environmental predictors (species distribution models), existent areas of conservation concern for seabirds (i.e. marine Important Bird Areas; marine IBAs) and threats to the marine environment in the West African areas heavily used by the shearwaters.

• There was an apparent inter-annual consistency on the spatial, foraging and trophic ecology of Cape Verde shearwater, but a strong alteration on the foraging strategies among breeding phases (i.e. incubation to chick-rearing)
• During incubation, birds mostly targeted a discrete region off West Africa, known by its enhanced productivity profile and thus also highly exploited by international industrial fishery fleets
• When chick-rearing, adults exploited the comparatively less productive tropical environment within the islands of Cape Verde, at relatively close distance from their breeding colony
• The species enlarged its trophic niche and increased the trophic level of their prey from incubation to chick-rearing, likely to provision their chicks with a more diversified and better quality diet

(A) Cape Verde shearwaters foraging regions during incubation (blue) and chick-rearing (red)
(B) other seabirds, (C) mIBAs and (D) fisheries

How was this research performed?


[1] vitorpaiva@ci.uc.pt; tommymelo@hotmail.com

IDEN7fied areas of megafauna
Confirmed, proposed and candidate marine Important Bird Areas (mIBAs)
Identified areas of megafauna bycatch and foreign license fishing region (within lines). Percentages over the plots depict the overlap between.

(A) Home range (95% kernel UD; lines) and core Foraging areas (50% kernel UD; filled polygons) of Cape Verde shearwaters Calonectris edwardsii from Raso Islet (white star) in 2013 (blue; N = 69 trips from 22 ind.) and 2014 (red; N = 68 trips from 21 ind.). 1 = Cabo Blanc; 2 = Southemmost area of the Parc National Du Banc D’Arguin; 3 = Cap-Vert, Dakar, Senegal
(B) Areas of Restricted Search zones (ARS; circles) of birds in 2013 (blue) and 2014 (red). Circles represent the ARS zones with maximum First Passage Time (FPT, with size proportionate to the size of ARS zone). SSF – Shelf-Slope Front
(C) Isotopic niche area based on stable isotope ratios (δ13C and δ15N) in whole blood of birds in 2013 (blue dots) and 2014 (red dots). The Standard ellipses areas (SEA) are represented by the solid bold lines (see Jackson et al. 2011 for more details on these metrics of isotopic niche width).

There was a high overlap between the Cape Verde shearwaters foraging areas with those of European shearwater species that overwinter in this area and known areas of megafauna bycatch off West Africa, but very little overlap with existing marine Important Bird Areas. Further investigation on the potential nefarious effects of fisheries on seabird communities exploiting the Canary Current system off West Africa is needed.