
Harbour and grey seals' foraging ecology in the Eastern English Channel highlight potential competitive trophic interactions

Yann Planque*^{†1}, Cécile Vincent^{‡2}, Florence Caurant^{§2}, Marie-Hélène Picard³, Marta Tykarska³, Matthieu Authier³, and Jérôme Spitz^{¶3}

¹Centre d'Études Biologiques de Chizé (CEBC) – Université de La Rochelle, CNRS : UMR7372 – UMR 7372 CNRS - Université de La Rochelle. Bâtiment "Institut du Littoral et de l'Environnement", 2 rue Olympe de Gouges, 17000 La Rochelle, France

²Centre d'Études Biologiques de Chizé (CEBC) – Université de La Rochelle, CNRS : UMR7372 – UMR 7372 CNRS - Université de La Rochelle. Bâtiment "Institut du Littoral et de l'Environnement", 2 rue Olympe de Gouges, 17000 La Rochelle, France

³Observatoire Pelagis – Université de La Rochelle, CNRS : UMS3462 – Université de La Rochelle / CNRS. 5 allée de l'Océan, 17000 La Rochelle, France

Abstract

Harbour (*Phoca vitulina*) and grey seals (*Halichoerus grypus*) are sympatric species occurring in the Eastern English Channel (EEC). Harbour seal colonies are established since the 1990's and increase (+21%/year), reaching nowadays around a thousand individuals. Several hundreds of grey seals were also observed in recent years (+30%/year) and may result from movements from the North Sea. In a context of potential competitive trophic interactions, we assessed their foraging ecology in the EEC by using a multi-disciplinary approach combining telemetry, stable isotopes and scat analyses. We analysed 283 harbour seal scats and 143 grey seal scats containing the remains of 6509 and 1388 individual preys respectively. Harbour seals' diet was mostly composed of juvenile and small flatfish (86% of ingested biomass [CI95%: 68-100]) including sole and plaice. Grey seals' diet was characterized by a higher variety of prey including 61% [38-87%] of the same flatfish species but larger in size, as well as 29% [13-54%] of round fish (mainly herring, whiting and pout) and 10% [1-23%] of squids. Carbon and nitrogen stable isotopes analysis of whiskers from 38 seals suggested a trophic overlap between the two seal species although grey seals generally fed on higher trophic level prey. The estimated total biomass consumed from 2015 to 2017 increased from 592 [490-701] to 750 [632-878] tons year for harbour seals, and increase from 422 [369-476] to 750 [675-827] tons for grey seals respectively. Lastly, telemetry showed that foraging areas of both species partly overlapped. Although some spatial and trophic partitioning was highlighted between the two species, harbour seals' trophic niche is included within the grey seals' one. The abundance of grey seals and their prey consumption will probably overtake that of harbour seals in the next years, potentially leading to an increase of competitive interactions which could affect harbour seal population dynamics.

*Speaker

[†]Corresponding author: yann.planque@univ-lr.fr

[‡]Corresponding author: cvincent@univ-lr.fr

[§]Corresponding author: fcaurant@univ-lr.fr

[¶]Corresponding author: jerome.spitz@univ-lr.fr