**Abstract of Anne-Sophie Deville's PhD Thesis,**
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## Energetic needs and spatial distribution of the Greater Flamingo (*Phoenicopterus roseus*), salt pans reconversion consequences for the conservation of the species

Understanding and predicting the consequences of land-use changes on species are essential to decrease the negative effects on biodiversity. Salt harvesting in commercial saltpans shaped anthropogenic habitats harboring a typical biodiversity. This is particularly true for the emblematic Greater flamingo (*Phoenicopterus roseus*) in the Mediterranean basin, saltpans offering foraging and nesting sites to this species. Nevertheless, the saltpans industry currently undergoes profound changes. In the Camargue (southern France), the saltpans of Salin-de-Giraud, which hold the unique French breeding site of the Greater flamingo, recently ceased their activity over half of the surface. The remaining part could be used for other industrial activities. Here, we aim at understanding and predicting the impacts of these changes on the breeding flamingo population, using an individual-based mechanistic model. This model needs three key parameters, the determination of which structured this work: i) the flamingo' efficiency to ingest food in function of the type and the density of prey, ii) flamingo energy requirements, iii) others environmental factors than food resources explaining flamingos' distribution in the saltpans. Our results show i) the importance of prey in the water column (e.g. *Artemia spp*.), easier to filter for flamingos comparing to prey in the sediment, ii) a flamingo preference for simple shaped ponds (i.e. circular) with low and medium salinity (<150 $g.l^{-1}$), iii) a higher sensitivity of males to a decrease of food resources due to their higher energy requirements comparing to females. This study allowed implementing an individual-based mechanistic model providing a decision-making tool to discuss the future management of the saltpans of Salin-de-Giraud. Our study argues in favour of further use and development of this type of predictive tool to anticipate the effects of land-use changes on biodiversity. We also open up perspectives about the methods available to anticipate these impacts.

**Keywords:**
*Artemia spp*., biological conservation, foraging ecology, ecological compensation, individual-based mechanistic models, energetic models, MORPH, NicheMapper™, *Phoenicopterus roseus*, saltpans

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