Thesis Abstracts

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MORANT ETXEBARRIA, J. (2022). *Behavioural ecology and conservation of the Egyptian Vulture in human-dominated landscapes: insights from long-term monitoring and movement ecology*. PhD thesis, University of the Basque Country, Spain. 313 pp. Correspondence: jmorant@aranzadi.eus

Human activities transformed virtually all landscapes worldwide to fulfil their basic needs (e.g. resource extraction, agriculture or leisure activities). By doing so, they also affect species inhabiting these human-dominated landscapes. Due to their historical link to human activities, apex predators, especially vultures, are especially vulnerable to human-induced behavioural alterations and have undergone population declines worldwide. Therefore, finding a solution that reconciles vulture conservation and human activities in such landscapes is necessary. By using a set of behavioural indicators (e.g. breeding, occupancy/ detectability and space use) from long-term monitoring and movement ecology, this thesis aims to build links between behaviour and conservation of Egyptian Vulture *Neophron percnopterus* in human-dominated landscapes. The current dissertation shows that the species invests similar effort in parental care and that incubation and hatching are important tipping points during the breeding season (Chapter 1). This information could be, in turn, used to design cost-effective monitoring while accounting for imperfect detection and breeding phenology and other environmental variables that could help to adapt monitoring programs to different available budgets (Chapter 2). Similarly, the knowledge of breeding behaviour of the species could be used to infer the impact of habitat alterations on species nest occupancy and reproduction patterns and to improve conservation programs (Chapter 3), and test whether management programs and collaboration networks resulted effective in reducing the synergistic effect of various human disturbances (Chapter 4). Finally, it poses an advance in the understanding of how certain human activities that provide continuous and predictable food pulses, such as farming, could alter species space use and favour residency in partial migratory species (Chapter 5), and that human-driven changes in migratory behaviour could even have consequences on fitness and energy use of different migratory phenotypes (Chapter 6). Overall, this work demonstrates the utility of increasing vulture behaviour knowledge to ascertain the effects of human activities on the species and find coherent conservation solutions that favour its persistence and promote vulture-human coexistence in anthropogenic landscapes.

Peer-reviewed research derived from the thesis:

Morant, J., Zabala J., Martínez J. E. & Zuberogoitia I. 2018. Out of sight, out of mind? Testing the effects of overwinter habitat alterations on breeding territories of a migratory endangered species. *Animal Conservation* 21: 465-473.

Morant, J., López-López P. & Zuberogoitia I. 2019. Parental investment asymmetries of a globally endangered scavenger: unravelling the role of gender, weather conditions and stage of the nesting cycle. *Bird Study* 66: 329-341.

Morant, J., González-Oreja J.A., Martínez J. E., López-López P. & Zuberogoitia, I. 2020. Applying economic and ecological criteria to design cost-effective monitoring for elusive species. *Ecological Indicators* 115: 106366.

Morant, J., Abad-Gómez, J. M., Álvarez, T., Sánchez, Á., Zuberogoitia, I. & López-López, P. 2020. Winter movement patterns of a globally endangered avian scavenger in south-western Europe. *Scientific Reports* 10: 1-11.

Morant, J., Scacco, M., Safi, K., Abad-Gómez, J.M., Álvarez, T., Sánchez, Á., Phipps W.L., Carbonell, I., García J., Prieta J., Zuberogoitia, I. & López-López, P. 2022. Environmental and social correlates, and energetic consequences of fitness maximisation on different migratory behaviours in a long-lived scavenger. *Behavioral Ecology and Sociobiology* 76: 111.

Zuberogoitia, I., Morant, J., González-Oreja, J. A., Martínez, J. E., Larrinoa, M., Ruiz, J., Aginako,I., Cinos, C., Díaz, E., Martínez, F., Galarza, A., Pérez de Ana, J.M., Vacas, G., Lardizabal, B., Iriarte, I. & Zabala, J. 2021. Management actions promote human-wildlife coexistence in highly anthropised landscapes: the case of an endangered avian scavenger. *Frontiers in Ecology and Evolution* 491.

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