

How urban living shapes reproductive decisions and success in gulls

Project ID: 3614

Supervisory team

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Registered institution: Swansea University

Host institutions: University of Exeter/Swansea University

Project description: How urban living shapes reproductive decisions and success in gulls. Some wild animals live and reproduce in urban environments, where they encounter novel resources and challenges. Yet we know surprisingly little about the costs and benefits of urban living, or how animals adjust their behaviour and physiology while maintaining health, welfare and reproductive success. Apparent success may reflect abundant food and nesting opportunities but could conceal nutritional, physiological or reproductive costs. Understanding why individuals differ in their responses can reveal the biological mechanisms that enable animals to adapt to rapid environmental change. Urban herring gulls (*Larus argentatus*) provide an exceptional system for addressing these questions. Individuals make different choices about where to nest, what to eat, and how to raise their offspring. Some nest at ground level, others on low roofs or high buildings, and their diets range from marine prey to human-derived foods. You will study approximately 100 breeding gull pairs on Swansea University's campus, linking nest-site choice and nutritional ecology with parental behaviour, physiology, affective state and reproductive success. Across breeding seasons, you will map available and occupied nest sites and follow identifiable birds and nests using observations, fixed cameras, ringing records and drone surveys. Monitoring will quantify reproductive decisions and outcomes, including egg laying, parental care, hatching, chick growth, survival and fledging. For focal parents, GPS tracking and dietary measures will establish reliance on urban, terrestrial and marine resources, while behavioural experiments and physiological sampling (faecal and feather glucocorticoids) will assess behavioural flexibility, affective state, stress and reproductive investment. These data will reveal how nest-site and foraging decisions relate to parental phenotype and chick success, whether different indicators of health and wellbeing align, and whether apparently successful urban breeding conceals costs to parents or offspring. You will gain interdisciplinary training in field biology, behavioural experiments, biologging, physiology, spatial analysis and statistical modelling. The project combines Swansea expertise in movement ecology, animal behaviour and endocrinology with Exeter expertise in cognition, behavioural plasticity and experimental studies of wild gulls. Support from Swansea's biodiversity staff and established ringing networks provides access, existing records and opportunities for long-term monitoring. You will establish general principles explaining how animals maintain health and reproductive success under environmental change, while informing evidence-based coexistence with urban wildlife. By linking environmental and nutritional inputs to behaviour, physiology, welfare and life-history outcomes, the project directly addresses BBSRC priorities in frontier discovery bioscience and integrated animal health.



Our aim as the SWBio DTP is to support students from a range of backgrounds and circumstances. Where needed, we will work with you to take into consideration reasonable project adaptations (for example to support caring responsibilities, disabilities, other significant personal circumstances) as well as flexible working and part-time study requests, to enable greater access to a PhD. All our supervisors support us with this aim, so please feel comfortable in discussing further with the listed PhD project supervisor to see what is feasible.