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Overview: Our research aims to understand how ecology and evolution shape both the demography and the health of vertebrate populations in the wild, and in turn, how the demographic processes are determining the strength of trait selection. To reach these objectives, we are bridging conceptual and methodological advances from population ecology, evolution, demography, epidemiology and statistics. As our study models are vertebrate species with high societal value, our research projects are often led in collaboration with the Office Français de la Biodiversité (OFB) and have an explicit applied component to improve the exploitation or the conservation of the targeted species.

Research axes:

- Quantifying the amount and the shape of individual heterogeneity in vertebrate populations in the wild, as well as its role in demographic and eco-evolutionary processes (with a special focus on mammals)
- Identifying and assessing the relative influence of the environmental (i.e. weather conditions, population density, habitat quality, predation, diseases, interspecific competition and anthropic pressure), evolutionary (e.g. phylogenetic inertia, lifestyle, size, and life history strategy), and individual (e.g. age, sex, or size) attributes that shape the diversity of individual trajectories, within and among populations of vertebrates
- Identifying population responses to global change, from phenotypic traits to demographic outputs such as population growth, age-structure and generation time
- Quantifying the magnitude of the sex-differences in trait-specific trajectories (with a special focus on the senescence process) and identifying the eco-evolutionary roots of these differences
- Identifying the genetic and physiological markers of aging for mammalian populations in the wild
- Exploring the evolutionary causes and consequences of actuarial and reproductive aging in the wild
- Assessing the health, demographic, and evolutionary implications of physiological stress at the individual level and quantifying their impact on population dynamics
- Determining the physiological and demographic implications of toxic pollutants for mammals in the wild
- Measuring health, behavioral, and demographic consequences of parasitism exposure
- Providing tools for the development of reliable predictions for population forecast of mammals with a high societal value

Biological models: Our research mostly relies on the long-term monitoring of mammalian populations in the wild. Thanks to a long-term collaboration with the OFB, we are collecting individual longitudinal data on a wide array of traits for more than 40 years for roe deer (Chizé and Trois-Fontaines study areas, France). Other ongoing long-term programs are focused on the Alpine marmot (Réserve de la Grande Sassière, France), Mouflon (Caroux-Espinouse massif, France), Wild boar (Châteauvillain, France), and Giraffe (Hwange, Zimbabwe).

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