(Invasive) alien vertebrates

Presence, distribution and potential spreading of the invasive alien species, raccoon (*Procyon lotor*), in Tuscany, in relation to environmental characteristics at different spatial scales

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Invasive alien species (IAS) are a major global threat to ecosystems, disrupting biodiversity and ecosystem functions and contributing significantly to biodiversity loss. Human activities have driven the spread of species beyond their native ranges, increasing introductions worldwide. Raccoon (*Procyon lotor*), an opportunistic mesopredator native to Central America, the United States, and southern Canada, was introduced to Tuscany through the accidental release from a local zoo, near the border of Foreste Casentinesi National Park. Known for its adaptability, raccoon can modify its behaviour and diet in response to local conditions, enabling it to thrive in various habitats, from human-modified landscapes to natural areas. In Tuscany, it has established a stable population, with predation as the primary impact on native species.

Our study aimed to assess the influence of landscape and fine-scale characteristics on raccoon distribution in Tuscany and create dispersal maps to forecast potential expansion into nearby regions. According to the Italian National Management Plan of the Raccoon, we stratified our study area based on proximity to water sources. We divided the territory into 2.5 x 2.5 km cells and randomly selected trap points along streams or rivers within each cell. Camera traps were deployed starting in June 2024, with sampling planned to continue through 2025. Landscape characteristics were calculated within a buffer around each sampling point, an area equivalent to the average home range size observed for male raccoons from data collected outside their native range. Similarly, fine-scale characteristics were assessed within a buffer corresponding to an average size of male racoon core area. We will present results from the first year of monitoring, providing a comprehensive analysis of the ecological factors that shape raccoon distribution, allowing us to explore how landscape features and habitat characteristics influence their presence and potential expansion in Tuscany. By assessing these dynamics, we can better provide the species' likelihood of colonizing new areas and better manage its spread in non-native areas.