New tools and methods

The observatory approach: continental-scale wildlife density estimation in Europe and more

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The European Observatory of Wildlife (EOW), within the ENETWILD project (www.enetwild.com, funded by the European Food Safety Authority), focuses on improving European wildlife monitoring by developing international data collection standards, supporting density estimation guidance, and fostering open, collaborative data networks. To achieve these objectives, EOW implemented a protocol using the random encounter model (REM) based on camera trap (CT) data for estimating mammalian density. This protocol integrates photogrammetry, allowing a three-dimensional reconstruction of camera scenes for calculating parameters essential to REM, including day range and detection values. The workflow, optimized on the Agouti platform, streamlines image processing and parameter estimation. Since 2021, ENETWILD stakeholders have employed the EOW protocol to assess densities of species like wild boar, roe deer, and red fox across Europe. By 2023, 30 institutions surveyed 44 sites in 22 countries, accumulating 79,092 CT activity days from 1,722 CT deployments. Density estimates show interannual stability with refined precision across several monitored populations. In 2024, network expansion included 40 institutions across 64 sites, prioritizing African swine fever (ASF)-impacted areas. 33 sites now fall within ASF-present countries, and 28 lie near the ASF frontline, highlighting regions where wild boar and domestic pigs coexist and where ASF risk is high. 20 sites (31%) contain an interface wild boar – domestic pigs, while 25 sites (39%) include wetland habitats, which are of possible epidemiological interest for avian influenza both within bird populations themselves and in relation to possible spill-over events to mammals (wild and domestic).

Ongoing networking efforts link EOW with other wildlife monitoring and disease-prevention initiatives, enhancing collaboration. The expansion of EOW sites aims to improve continental data representativeness, especially in regions where emerging diseases like ASF and avian influenza pose significant risks. The refined protocol, with augmented photogrammetry and Agouti functions, has enhanced data standardization and minimized user-related error. The EOW provides a perfect scenario to test improved approaches based on CTs but also novel technologies such as eDNA. EOW data supports continental-scale risk analysis, providing harmonized density estimates essential for disease modelling and aims to contribute to future schemes of biodiversity monitoring in Europe, such as the proposed EU Biodiversity Observation Coordination Centre (EBOCC). Consistent multi-year data collection across diverse ecological conditions will ensure comprehensive trend data for effective risk assessment in wildlife management.