

## **Wildlife ecotoxicology: cumulative effects through the food chain to the community**

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Wildlife, including birds, mammals and amphibians, are exposed to a wide range of contaminants. Sometimes it is through direct exposure, which is commonly related to food web accumulation. Exposure to environmental contaminants, already released in the environment, is generally at relatively low levels but chronic over time. Additionally, animals may be exposed to rather high levels of compounds that are currently purposely released in the environment. Those can include plant protection products, insecticides or fungicides, or mammalian pest control products such as rodenticides. Effects of low level, chronic exposure to compounds may be very elusive and difficult to factor from effects of other stressors. However, advances in molecular biology are improving our ability to detect such subtle perturbations. Generally, exposure does not result in direct mortality, but animals show lower fitness, and may be more vulnerable to other stressors. In contrast, effects of acute toxicity may be relatively obvious, including mortality, although affected animals may be difficult to find in the field. Linking subtle molecular or 'biomarker' effects to individual health can be challenging, linking effects detected at the individual level, even mortality, to impacts at the population level is even more challenging. For both regulatory purposes and risk assessment it is essential to obtain information on risks from both acute and chronic exposure scenarios, and to attempt to determine links between measurable biomarkers, other stress factors and implications for populations, and even communities. In this session we are soliciting presentations that provide insight into effects at both molecular and higher levels of organization, and in particular studies that make credible connections between levels of organization and with other environmental variables. This could include assessments that employ an adverse outcome (AOP) framework.