

**2009 SETAC North America Annual Meeting
Platform Presentation Abstract**

Title: Adverse Outcome Pathways and Ecological Risk Assessment: Bridging to Population Level Effects: Report of Pellston Workgroup 3

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The continuing persistence and genetic diversity of populations is a key concern for environmental regulations. Population-level responses integrate the cumulative effects of chemical stressors on individuals as those individuals interact with and are affected by their conspecifics, competitors, predators, prey, habitat and other biotic and abiotic factors. Models of population-level contaminant effects, therefore, can integrate information from lower levels of biological organization and feed that integrated information into higher-level landscape and ecosystem models. As individual-level endpoints are taken to predict population responses, this requires that biological responses at lower levels of organization be translated into a form that is useable by the population modeler. In this paper we describe how mechanistic data, as captured in adverse outcome pathways, can be translated into modeling focused on population-level risk assessments. First, we present a succinct overview of different approaches to population modeling, and discuss the types of data needed for these models. Then we discuss how toxicity data are used currently for population modeling, and provide recommendations as to how testing might be modified to better generate information to support modeling. From this we describe how different key processes measured at the level of the individual serve as the bridge between mechanistic toxicology data and predictions of population status, and provide case examples of how this linkage can be achieved. This presentation is a summary of the work product of Work Group 3 “Linking to Population-Level Effects” from the 2009 SETAC Pellston Workshop entitled, “A Vision and Strategy for Predictive Ecotoxicology in the 21st Century: Defining Adverse Outcome Pathways Associated with Ecological Risk”