

Title: Use of Risk Quotient and Probabilistic Approaches to Assess Risks of Pesticides to Birds

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When conducting ecological risk assessments for pesticides, the United States Environmental Protection Agency typically relies upon the risk quotient (RQ). This approach is intended to be conservative in nature, making assumptions related to exposure and effects that are intended to represent upper bounds of the range of available data. One major limitation of the RQ approach is that it does not explicitly describe the risk associated with exposure to the pesticide for assessed animals or plants. However, risk can be estimated using a more refined approach that is probabilistic in nature, relying on probability distributions to describe variables that influence exposure and potential effects. Such probabilistic models will also allow estimation of the degree of confidence a risk assessor should place on a given risk estimate. This poster discusses the two approaches, using RQs and a probabilistic examination of the risks of diazinon (an organophosphate insecticide) to endangered and threatened species of birds. The analysis relies upon RQ-based models that independently consider conservative exposures through diet, drinking water, inhalation and dermal contact. In contrast, the Terrestrial Investigation Model (TIM), which is a probabilistic model, integrates these exposure routes and considers movement of birds on and off of treated fields as well as a range of sensitivities in individual birds. Further refinements to potential reproductive effects can be considered using the MCnest model, which considers how the intersection of pesticide exposure at sensitive points in species-specific reproductive cycles may influence the fecundity of birds.