

**Obstacles to using population endpoints in risk assessments.** W. Nelson Beyer, Patuxent Wildlife Research Center U. S. Geological Survey, Biological Resource Division, 12011 Beech Forest Road, Laurel, MD

In guidance documents on ecological risk assessments, the EPA has asserted that we should shift from assessments based on the individual toward assessments based on the population. Although population biology should play a role in ecotoxicology, I think it is also reasonable to suggest that population analyses fail to tell the whole story in ecotoxicology and are sometimes inappropriate endpoints of risk assessments. Population arguments may be misused if used without proper guidance from the EPA. We should also remember that risk assessments are conducted for different purposes. If a risk assessment addresses the viability of a species, for example, then it certainly makes sense to model that population. It does not necessarily follow that a population approach is equally valid at a superfund site or in a natural resource damage assessment case, where the purpose is to determine whether natural resources have been injured and whether the site must be remediated. There may also be differences in the amount of protection we wish to provide to different kinds of organisms. We should be specific about what we mean and define our terms. If someone says we should look for population effects, we should ask specifically how he is defining population and what he means by a population effect. What may seem like a simple concept may become a nightmare in practice. Hazards to populations of migrating birds may be more difficult to evaluate than hazards to populations of fish in a confined area. This topic has serious and immediate implications to our natural resources. Before recommending that risk assessments be carried out at the population level, the EPA should provide clear guidance to overcome four basic obstacles. 1) The EPA should explain clearly which of the many definitions of population it wants assessors to use. 2) The EPA should provide clear detailed instructions on how this new type of assessment should be carried out, explain which population models are appropriate, provide criteria for evaluating results from population models, and list instances in which a population approach is not appropriate. 3) Explain whether deformities, mutations, gross lesions, tumors and other gross lesions, other sublethal effects of poisoning and outright deaths are now considered acceptable to the EPA if a population model predicts that the mortality can be sustained. 4) The EPA should address the legal aspects of their recommended change. The Department of Interior must protect trust species under the Migratory Bird Treaty Act the Natural and Resource Damage Assessment regulations. The examples of injury spelled out in these Natural Resource Damage Assessment regulations are clearly independent of populations.