

Garnier-Laplace et al. A multi-criteria weight of evidence approach to ecological benchmarks JRP

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A multi-criteria weight of evidence approach to derive ecological benchmarks for radioactive substances.
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Dose rate benchmarks are required in the tiered approaches used to screen out benign exposure scenarios in radiological ecological risk assessment. Such screening benchmarks, namely the predicted no-effect dose rates (PNEDR), have been derived by applying, as far as possible, the European guidance developed for chemicals. To derive the ecosystem level (or generic) PNEDR, radiotoxicity EDR_{10} data (dose rates giving a 10% effect in comparison with the control) were used to fit a species sensitivity distribution (SSD) and estimate the HDR_5 (the hazardous dose rate affecting 5% of species with a 10% effect). Then, a multi-criteria approach was developed to justify using an assessment factor (AF) to apply to the HDR_5 for estimating a PNEDR value. Several different statistical data treatments were considered which all gave reasonably similar results. The suggested generic screening value of $10 \mu Gy h^{-1}$ (incremental dose rate) was derived using the lowest available EDR_{10} value per species, an unweighted SSD, and an AF of 2 applied to the estimated HDR_5 . Consideration was also given to deriving screening benchmark values for organism groups but this was not thought to be currently appropriate due to few relevant data being currently available.

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