

ICRP

International Commission on Radiological Protection

In their revised Recommendations the ICRP (2007) recognised that there was a need to provide advice on exposure of non-human species to ionising radiation. The ICRP intends to develop a framework to assess the relationships between exposure and dose, and between dose and effect, and the consequences of such effects, for non-human species, on a common scientific basis (see also [ICRP Publication 91](#)).

ICRP Committee 5 is concerned with radiological protection of the environment and have published the initial elements of the framework in ICRP Publication 108: [Environmental protection: the concept and use of reference animals and plants](#) (often referred to as the 'RAP report').

The ICRPs aim is to develop an approach that is both compatible with 'other approaches being made to protect the environment from all other human impacts, particularly those arising from similar human activities' and also the present system for human radiological protection. The intended approach is stated as being developed to provide 'high level' guidance for demonstration of compliance corresponding with existing/emerging national and international legislation and serve as a basis from which national and other bodies could develop, as necessary, more applied and specific numerical approaches to the assessment and management of risks to non-human species. The implication is that the ICRP approach is not meant to be a replacement for other methods, but rather should be seen as an encompassing system which other approaches can use as a basis and point of reference when performing their own bespoke analyses.

The ICRP have opted to use a similar approach to Reference Man for the environment, proposing a set of 12 Reference Animals and Plants (RAPs). The list of RAPs is significantly smaller than the corresponding reference organism suites used in the ERICA and the EA R&128 approaches ([RAP list](#)). However, the ICRP approach places more emphasis on life stages than the other methodologies considered, with ICRP-108 presenting DCC values for a number of life-stages for some of the RAPs. The RAPs are suggested as 'points of reference' for drawing comparisons with sets of information on other organisms. It is acknowledged that the RAPs may not be the direct objects of protection *per se* and that it may be necessary to establish a 'secondary set of Reference Organisms for a specific purpose or geographical area'. Since there are no internationally accepted 'rules' on classification above Family (or 'Super Family') level, the ICRP have suggested that this constitutes the most suitable level of generalisation. A RAP is defined as: 'a hypothetical entity, with the assumed basic biological characteristics of a particular type of animal or plant, as described to the generality of the taxonomic level of Family, with defined anatomical, physiological, and life-history properties, that can be used for the purposes of relating exposure to dose, and dose to effects, for that type of living organism.' The RAPs are defined in more specific terms than are reference organism in approaches such as [ERICA](#) and [EA R&D128](#).

The RAP report presents dose conversion coefficients for each of the RAP geometries which have been estimated using the methodology developed for the [ERICA Tool](#). A large component of the ICRP report comprises a review of radiation effects data for nonhuman species. This is used to suggest a 'derived consideration reference level' (DCRL) for each RAP. The DCRLs are described as a band of dose rate within which there is likely to be some chance of deleterious effects of ionising radiation occurring to individuals of that type of Reference Animal or Plant, derived from a knowledge of defined expected biological effects for that type of organism that, when considered together with other relevant information, can be used as a point of reference to optimise the level of effort expended on environmental protection, dependent upon the overall management objectives and the exposure situation.

A report by an ICRP Committee 5 task group presenting transfer parameters for RAPs has now been published



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