TASK GROUP 99
Reference Animal and Plant (RAP) Monographs

ICRP 2023
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Joint TG between Committee 1: Radiation Effects & Committtee 4: Application of the Commission's Recommendations

GOAL: To review and update data and methods to improve the use and practicality of the ICRP RAPs

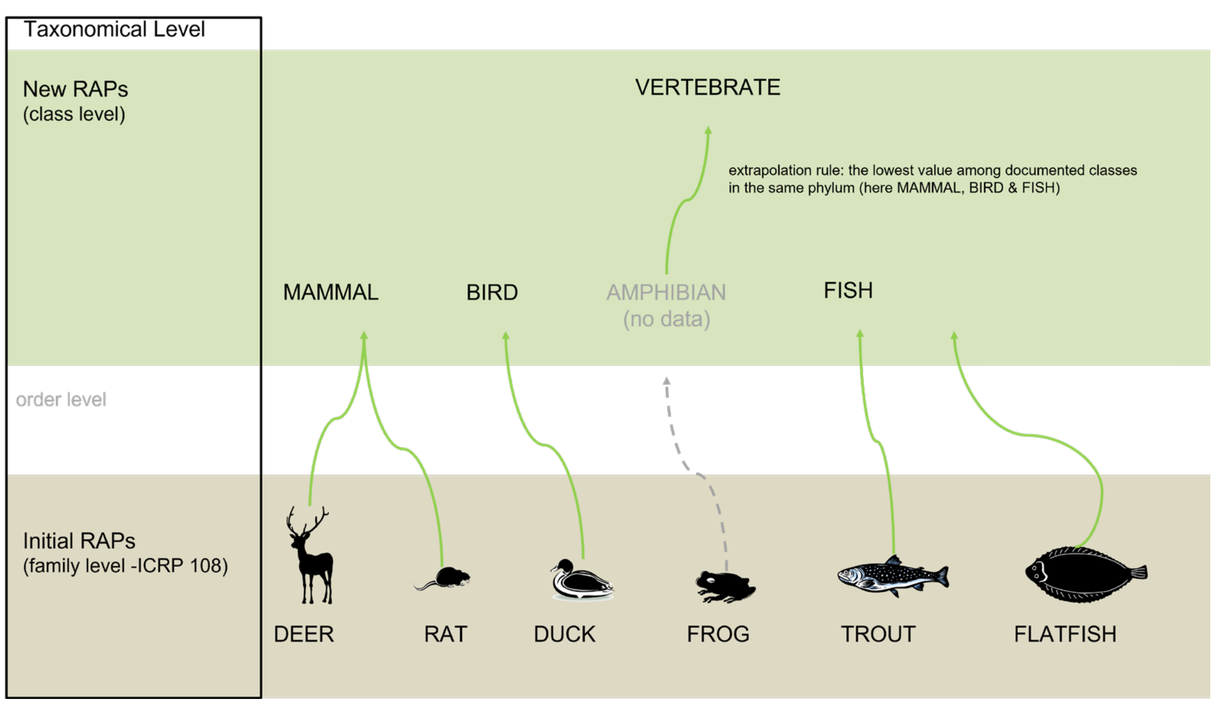
Deliverables

- A report describing the methods used for meta-analyses, and existing data sources (type and quality) for fauna and flora. The focus is on the statistical method for establishing Derived Consideration Reference Level (DCRL) values for the three exposure situations (planned, emergency and existing), providing guidance on how to implement this method, and discussion on comparison of the outcomes with current DCRLs from Publication 108 (2007)
- A series of electronic annexes (Excel sheets) presenting all data, organised by type of exposure (acute or chronic) and wildlife group defined at the taxonomic level of 'Class', including the initial RAPs.

New RAP Definition to Enhance the Applicability of the Concept

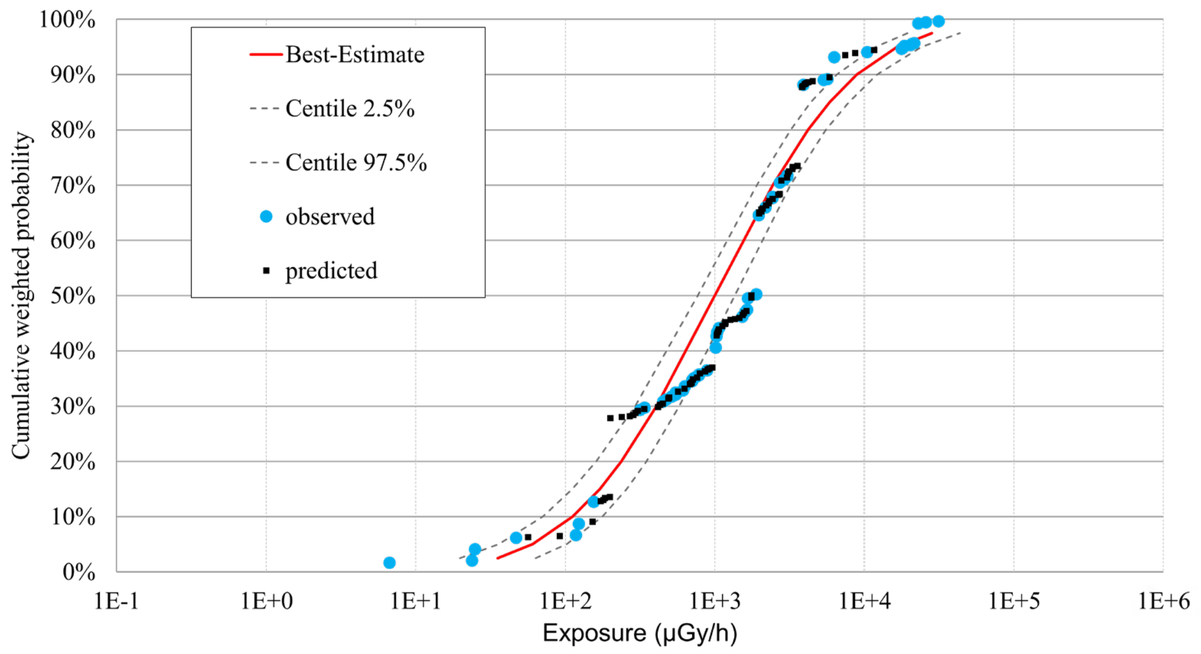
From the current 12 RAPs defined at the Family level:
Main challenge due to poor representativeness of biodiversity

Definition of new RAPs at the Class level:
"Hypothetical entities, with anatomical, physiological, and life-history properties defined at the required level of taxonomy (e.g. species, genus, family, class, phylum) to relate exposure to dose and to understand the effects at the level of population"



How to Derive DCRL Transparently

- Systematic method to derive DCRLs independent of the RAP-type group or the type of exposure (acute or chronic)
- Use of quality-checked data from updated FREDERICA-2010 database to build dose(rate)-effect relationship(s) by (species, endpoint) for acute or chronic exposure regimes, and estimate ED50 - dose accounting for 50% effect in Gy, or EDR10 – dose rate accounting for 10% effect in µGy/h
- Fit Endpoints Sensitivity Distribution (ESD) by wildlife group (either Class or higher taxonomic level) and for acute or chronic exposure regimes
- Use of Acute To Chronic prediction model conceived and developed to enhance the chronic exposure dataset
- Discussion of several options to derive DCRL upper and lower bounds (e.g. 5th & 10th percentiles; bounds of CI95 of the 5th percentile; 5th percentile x Extrapolation Factor as lower bound and best-estimate as upper bound)
- Verification of consistency of DCRLs with more recent dataset (after 2010) and comparison of DCRL values with evidence from radiocontaminated sites



Chronic Endpoint Sensitivity Distribution for Mammals

Conclusions

The presented statistical approach is based on an objective method, replacing the expert judgement used previously. Moreover, it enables a systematic derivation of DCRLs, which can be easily updated when new data become available.

Some uncertainties are addressed using multicriteria extrapolation factors to combine with the 5th percentile approach but research is needed to fill some knowledge gaps (actual species sensitivity in the field, multiple stressors, multigenerations, etc)

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