

Radiological Protection
2022

Building a Framework for Post-Nuclear Accident Recovery Preparedness

National-Level Guidance



NEA Workshop on Preparedness for Post-Nuclear Accident Recovery

Environmental recovery after a nuclear accident: what are the risks and what do we protect?

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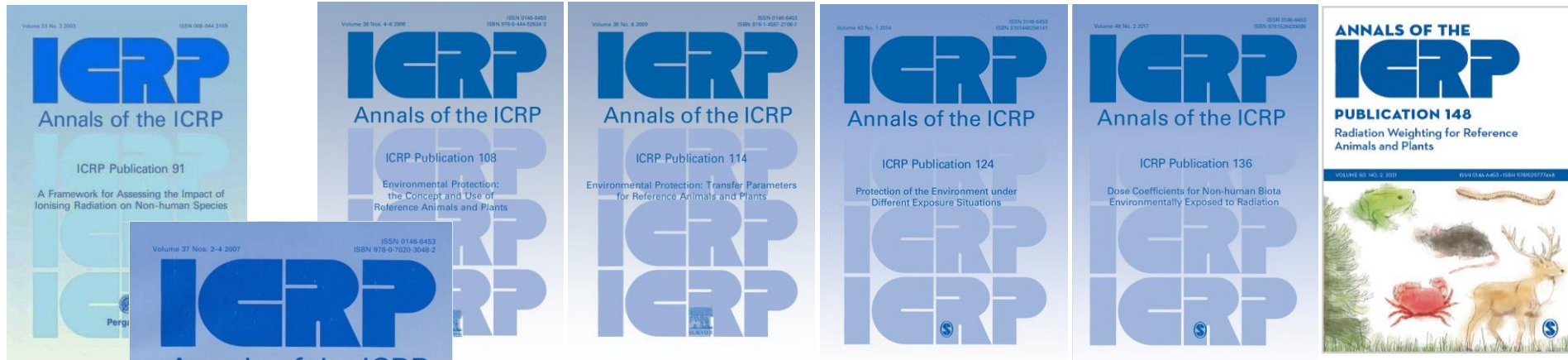
³National Institute of Advanced Industrial Science and Technology, Japan

Outline

- Acknowledgement
- Impact thresholds and real-life experience – FDNPP
- Issues for post-accident recovery - is there concern?
- Towards ‘holistic’ environmental RP
- PLANNING (exposure situations)
- Implications for post-accident recovery



Environmental Protection in ICRP



Other relevant publications

- Pub 122 Geological Disposal
- Pub 138 Ethics
- Pub 142 NORM
- Pub 146 Large accident

Ongoing work

- TG 97 Near-surface disposal
- TG 98 Remediation
- TG 99 Consolidation of DCRLs, etc.
- TG 105 ERP Application
- TG 110 RP in vet medicine (*approved for publication*)
- TG 114 Reasonableness and Tolerability
- TG 124 Justification (NEW)
- TG 125 Ecosystem services (NEW)

The ICRP system (environmental RP)

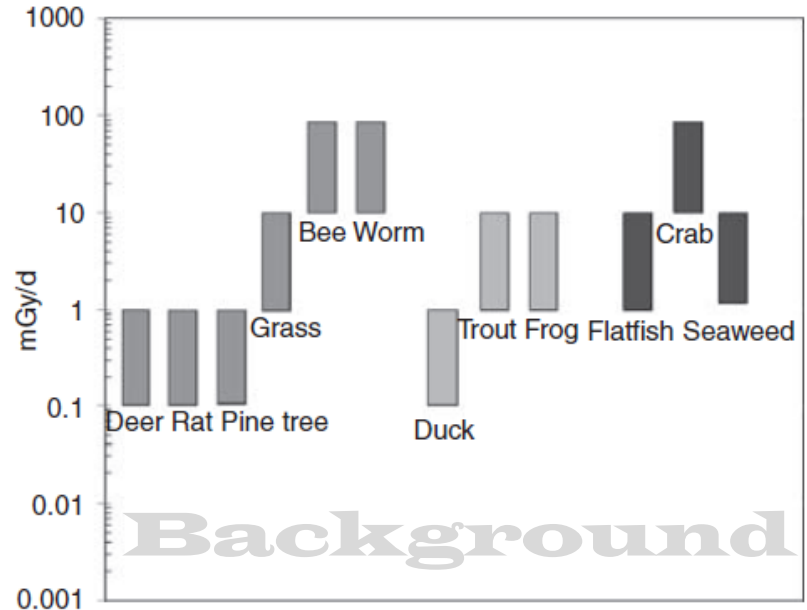
Core elements (*Publication 108*)

Provides (generic) protection targets:

Maintain biological diversity, Conservation of species, Protect health and status of Natural habitats, Communities, Ecosystems

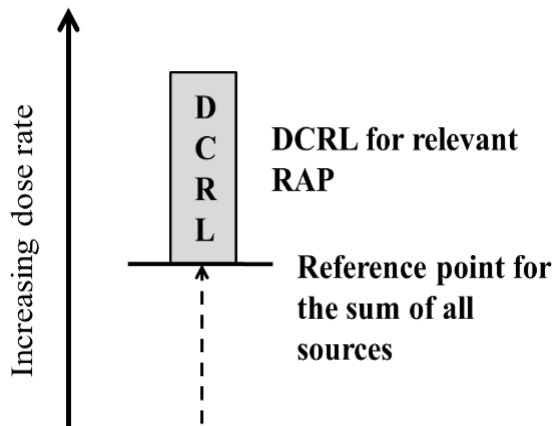
Introduces a set of 12 *Reference Animals and Plants (RAP)* and related *Derived Consideration Reference Levels (DCRL)*

The DCRLs define dose rate bands for RAPs where deleterious effects could occur

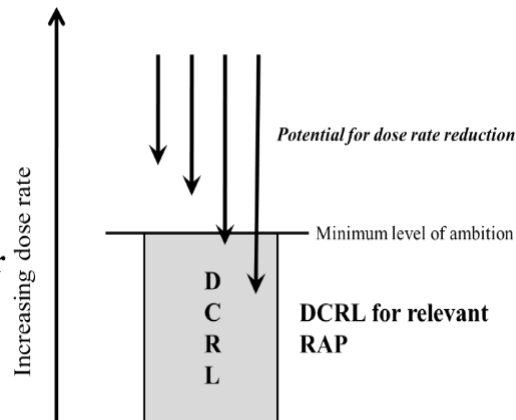


Application in exposure situations

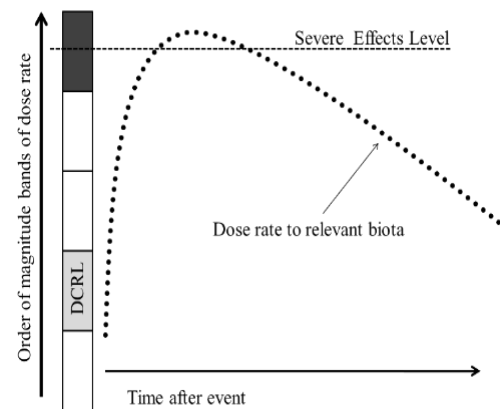
Planned



Existing



Emergency

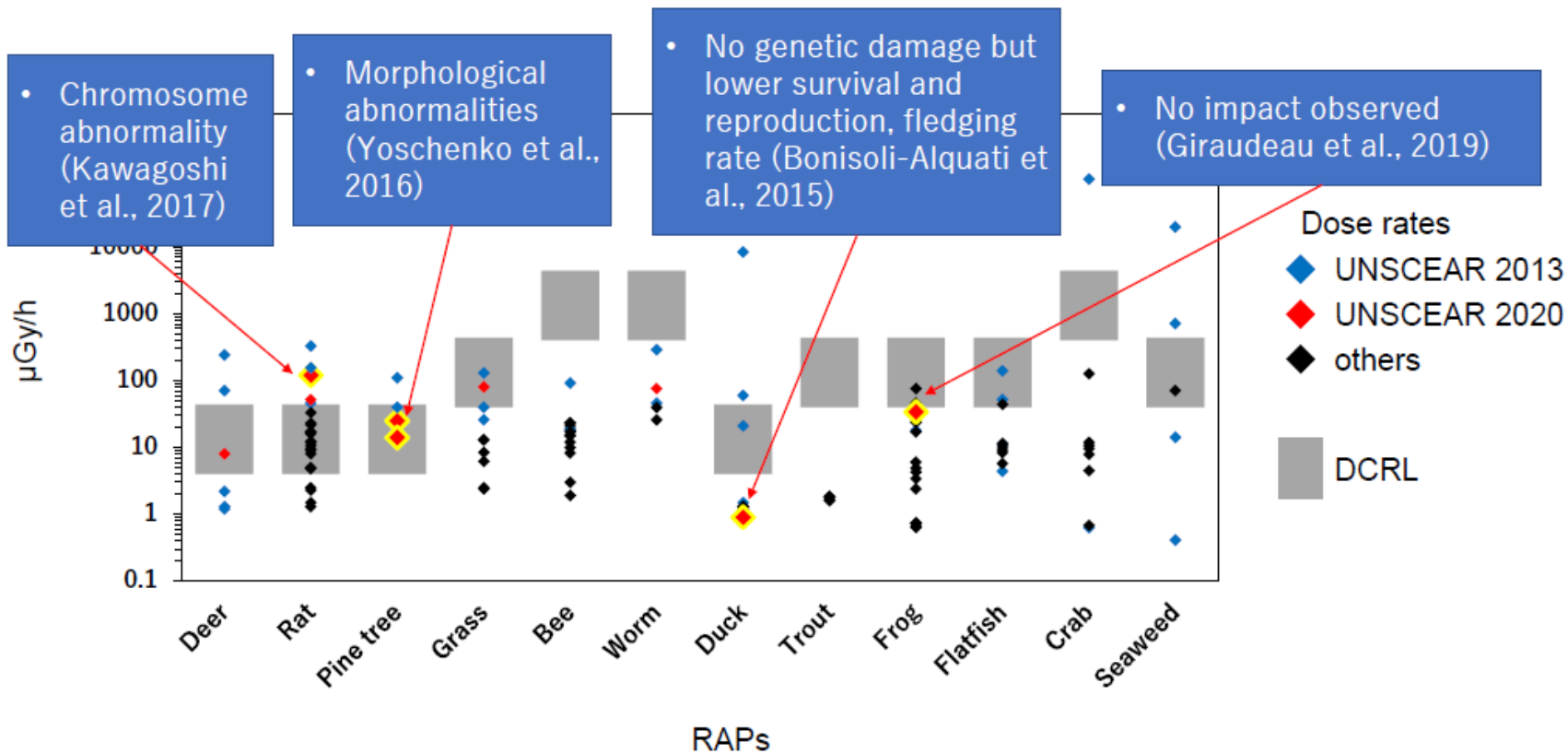


ICRP Publication 124

Scan with phone camera for link to P124 →

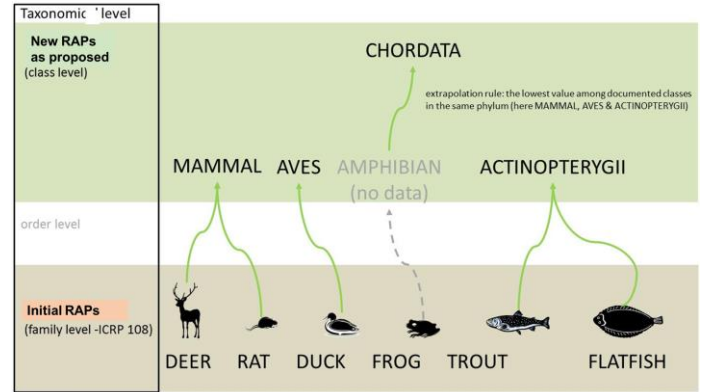


DCRLs in practice – FDNPP case

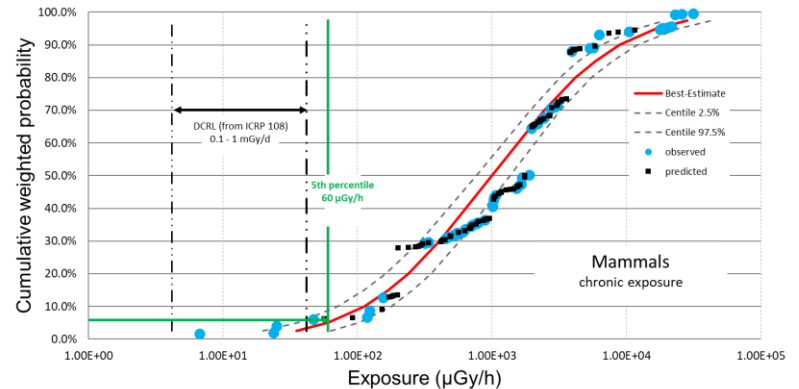


Issues for post-accident recovery

- Is there concern for the environment?
- Improved risk assessments
- Holistic definition of ‘environment’ and environmental protection
- Include environment in planning - for *all* exposure situations



How the initial definition and the proposed one relate to each other – example for a subset of RAPs



A ‘holistic’ approach

Review of the 2007 Recommendations (*Publication 103*) commenced

Clement et al. 2021, Keeping the ICRP recommendations fit for purpose, [Journal of Radiological Protection](#), [Volume 41](#), [Number 4](#):

- “...ICRP largely took the existing approaches to conservation of species as its point of departure, with focus on organisms in the natural environment.”
- “...may not be sufficient when considering ecosystems that are created and managed by people for the purposes of delivering goods, services and cultural value for human populations.”

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IOP Publishing | Society for Radiological Protection

Journal of Radiological Protection

J. Radiol. Prot. 41 (2021) 1390–1409 (20pp)

<https://doi.org/10.1088/1361-6498/ac1611>

Scan with phone camera for link to paper →



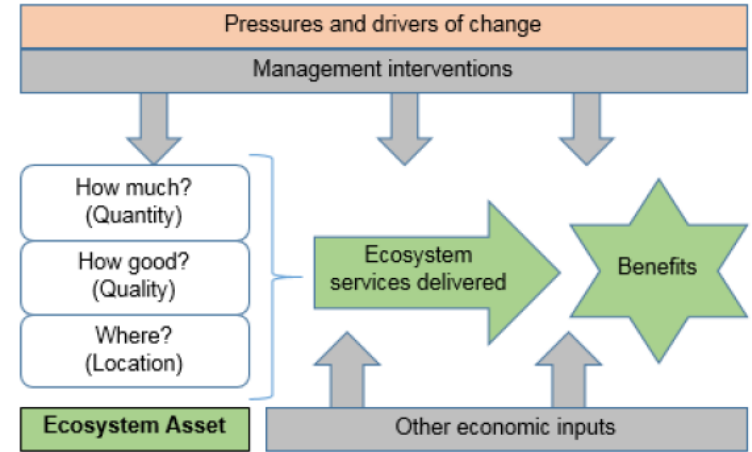
A 'holistic' approach

Environmental radiation protection refers broadly to the protection of both natural and managed environments, prioritizing but not limited to non-human life, from the detrimental effects of ionizing radiation exposure in support of conservation, ecosystem services, sustainable development, and the overall well-being of humanity

A 'holistic' approach

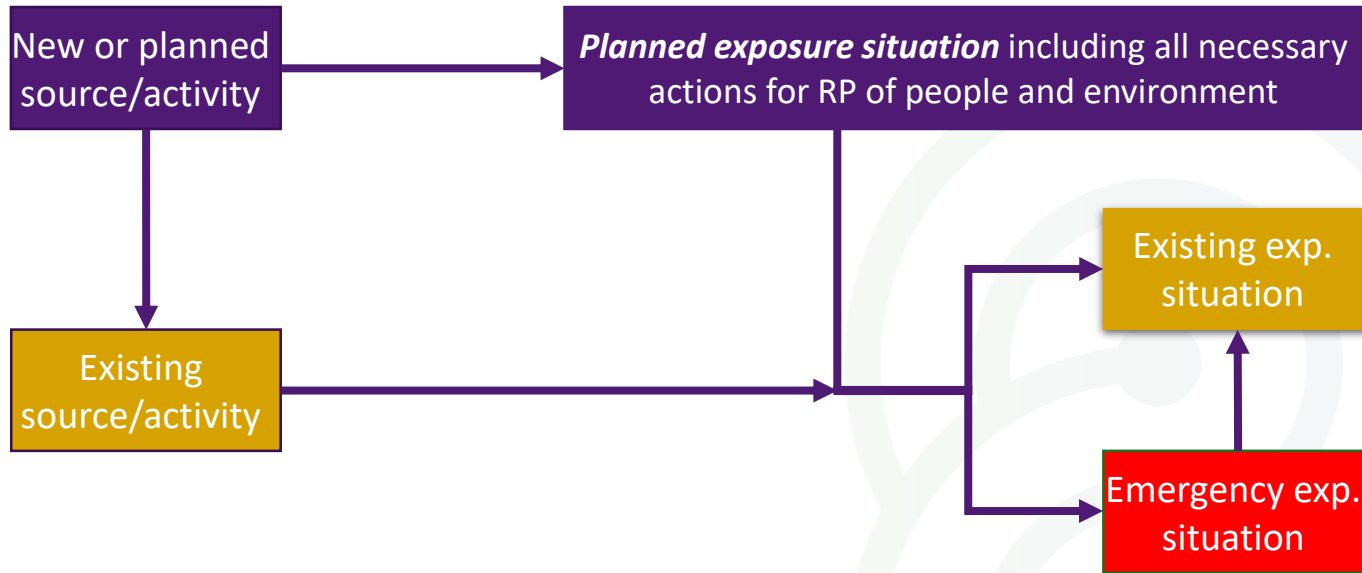


17 interlinked global **Sustainable Development Goals** (SDGs) designed to be a "blueprint to achieve a better and more sustainable future for all".




Ecosystem services provide us with economic, environmental, social, cultural and spiritual benefits that enrich our lives and underpin our economy. (*Environment Agency of England & Wales*)

PLANNING for exposure situations

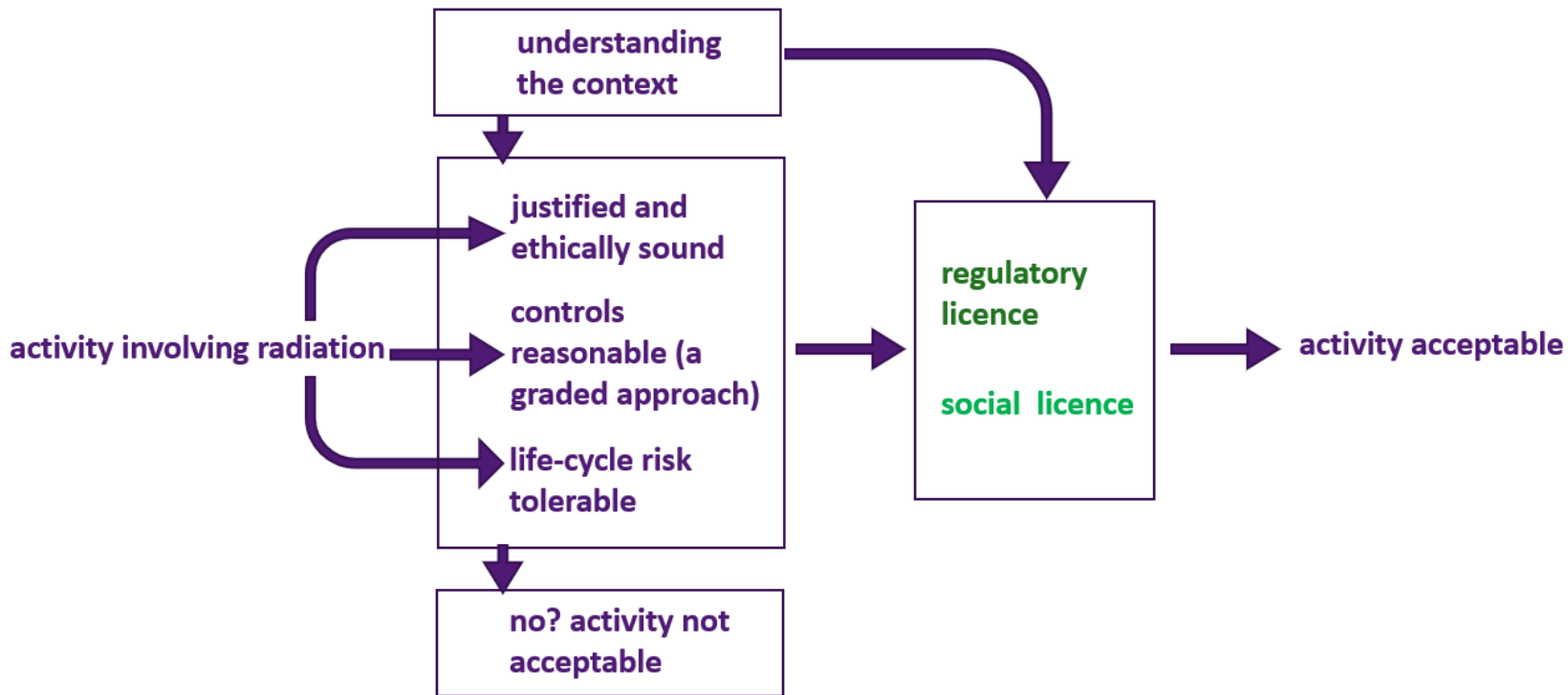


Elements to consider

Planning for post-accident (environmental) recovery

- understanding ‘the prevailing circumstances’
 - what is tolerable and reasonable with regard to recovery targets and considering ecosystem services
 - responsibilities
 - coordination
 - communication
 - consultation
- 

A defensible outcome



Thank you!

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