science summary

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Sampling at Drigg sand dunes

Science summary: SC070019

A report published by the Environment Agency provides new data on radionuclides in a variety of wildlife species (including small mammals and reptiles) collected in sand dunes which are contaminated indirectly by permitted discharges from a nuclear reprocessing plant. The data can be used to test and refine computer models currently used to predict the impact of ionising radiation on the environment.

A number of methods are currently used to assess the possible impacts of ionising radiation on the environment. However, there has been limited attempt to validate the computer models used in these methods to predict the transfer of radionuclides through the food chain for wildlife.

The Environment Agency, in collaboration with Natural England, carried out a sampling study to collect data on radionuclides in amphibians, vegetation, invertebrates, reptiles, birds and small mammals in the Drigg sand dunes (Cumbria, UK). These data were made available to compare to predictions from assessment models. The results of this comparison indicate that there is likely to be no adverse impact on wildlife in the sand dunes.

Drigg sand dunes are protected under international and national environmental legislation and as a result the site formed one of the case studies of the EU-funded ERICA project on radioactive contaminants. The initial assessments showed how little data was available for many of the species present, such as amphibians and reptiles, in the sand dunes. This report addresses this gap in our knowledge.

Wildlife sampling was conducted in accordance with the requirements of the Wildlife and Countryside Act 1981, the Conservation (Natural Habitats) Regulations 1994 and the Animals (Scientific Procedures) Act 1986. Samples were collected for amphibian, bird, mammal, reptile, vegetation and invertebrate species. All samples were analysed to determine whole-body activity concentration of gamma-emitting radionuclides. The only anthropogenic gamma-emitting radionuclides detected were ^{137}Cs and ^{241}Am. A subset of samples were also analysed (by alpha analysis) to determine activity concentrations of ^{99}Tc, ^{90}Sr, ^{239,240}Pu and ^{241}Am.

The results reported here contributed to the testing of the ERICA Integrated Approach, a methodology developed to assess environmental exposure, effects and risks from ionising radiation by a European Union funded project. They will also be used to test the predictions of the Environment Agency 'R&D 128' methodology currently used to estimate activity concentrations in and doses to biota from ionising radiation in England and Wales. The study also provides data with which to refine current methods. For instance, the database included within the ERICA Integrated Approach contains no measured data for the transfer of Tc to terrestrial animals. This report offers new data on Tc levels in wildlife.

This summary relates to information from Science Project SC070019 reported in detail in the following output:-

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