ACCUMULATION OF ^{137}Cs IN WETLANDS AND THEIR IMPORTANCE IN RADIOECOLOGICAL RISK ASSESSMENTS

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Wetlands function as nurseries and feeding areas for both terrestrial and aquatic species and are habitats for many endangered species such as frogs, salamanders and snakes. Wetlands alter the hydrology of streams and rivers, enhance sediment deposition and work as a filter to coastal waters retaining nutrients as well as contaminants. Due to the lack of easily identifiable direct pathways to humans wetland ecosystems have generally been neglected within radioecological research. There is a large diversity of wetlands and some of them can accumulate and function as sinks for radionuclides. In Sweden wetlands are among the ecosystems where the highest activity concentrations have accumulated after the Chernobyl accident. This paper summarizes factors that are important to the accumulation of radionuclides in wetlands. As an example, one wetland ecosystem in Sweden contaminated by ^{137}Cs due to the Chernobyl accident will be described in more detail. The average activity concentration in this wetland is 1.1 MBq/m^2, i.e. 10 times higher than in the surrounding areas. Soil and sediment samples were collected and the ^{137}Cs activity concentrations were measured. A budget calculation of ^{137}Cs in the wetland area was conducted, indicating that the accumulation of ^{137}Cs is still ongoing seventeen years after the accident. High activity concentrations are likely to remain in this ecosystem for a long time, resulting in long-term exposure for organisms living there. The maximum external ^{137}Cs dose rate to frogs was estimated to 96 mGy/year. Hence, identification and consideration of wetlands that accumulate radionuclides to a high extent are important in radioecological risk assessments for the protection of plants and animals from ionizing radiation.