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Potential Impacts of Landfill Leachate to Alligator River National Wildlife Refuge

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Potential Impacts of Landfill Leachate to Alligator River National Wildlife Refuge. Winger, PV 1, Lasier, PJ1, and Augspurger, T2. 1 USGS Patuxent Wildlife Research Center, Warnell School of Forest Resources, University of Georgia, Athens, GA, 2 US Fish and Wildlife Service, Ecological Services, Raleigh, NC. Surface runoff or leachate from two landfills have the potential to impact fish and wildlife resources associated with Alligator River National Wildlife Refuge, Dare County, North Carolina. Sediments were collected from 12 locations in canals down-gradient from the landfills and from two reference sites for laboratory assessment of sediment quality. Sediments were analyzed for metal (As, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn) and organic contaminants (PAHs and organochlorine pesticides). Chronic toxicity of the sediments was determined using 28-d static-renewal exposures with Hyalella azteca (Crustacea: Amphipoda) with survival and growth as the test endpoints. Acute toxicity was evaluated using static 96-h exposures of H. azteca to sediment pore water. Based on the toxicity evaluation, sediments from four locations were selected for a 28-d bioaccumulation study with Lumbriculus variegatus (freshwater oligochaete). Solid-phase sediments were not acutely toxic to H. azteca, but length was significantly reduced from five locations. Sediment pore waters from four locations were acutely toxic to H. azteca. Bioaccumulation studies exhibited uptake of several metals and PAHs, demonstrating the availability of these contaminants to the biota. Residue analyses of the sediments showed that several metals and PAHs exceeded sediment quality guidelines, and pore water concentrations of several metals exceeded water quality criteria for the protection of aquatic wildlife. These data demonstrate that runoff or leachate from the landfills have reduced sediment quality and have the potential to adversely affect resident fish and wildlife resources associated with Alligator River National Wildlife Refuge. Based on these studies, Dare County will remove contaminated sediments from the discharge canals and implement a monitoring program.