DOI 10.21685/2500-0578-2021-4-3

A MULTIFACETED APPROACH TO ASSESSING THE EFFECTIVENESS OF REMEDIATING OIL-CONTAMINATED SOILS

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Abstract. Soil quality is its ability to perform the most important ecological functions, determining the conditions for the existence of biota and the quality of adjacent spheres – water and air. This article is devoted to the study of the remediated area after oil pollution, subject to overgrowing. A comprehensive assessment of the ability of the remediated soil to provide ecosystem services has been conducted. The properties of the remediated soil were assessed with traditional physicochemical methods. The ability of the established Technosol to create ecosystem services was assessed by microbiological activity, the composition of vegetation on the site, as well as by phytotesting to determine the redox activity of the test culture. Technosol properties (pH, organic carbon content, catalase activity, CO_2 efflux) varied greatly within the remediated area, which was also reflected in the phytotesting results. In certain areas of the investigated territory Technosol had a good ecological state, but in other areas it had a satisfactory and unsatisfactory state with moderate to severe toxicity. The residual content of oil products in the layer of 20–50 cm under the brought soil had a negative effect on the height of the test culture. A close correlation was established between the indicators of microbiological activity and the state of the test culture (height, weight, redox activity), together they reflected the ability of Technosol to provide ecosystem services or perform the ecological functions of the soil. Residual oil products and the associated certain toxicity did not interfere with the self-overgrowth process of Technosol.

Keywords: biochemical activity, ecosystem services, meadow vegetation, oil pollution, phytotesting, remediation, Technosol, self-overgrowth, toxicity

For citation: Eremchenko O.Z., Moskvina N.V., Mitrakova N.V., Efimik E.G., Shestakov I.E. A multifaceted approach to the assessment of the effectiveness of remediation of oil-contaminated soils. *Russian Journal of Ecosystem Ecology*. 2021;6(4). (In Russ.). Available from: doi:10.21685/2500-0578-2021-4-3