

RESTORATION OF VEGETATION ON MINE LANDS NEAR MONCHEGORSK (MURMANSK REGION, RUSSIA)

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Abstract. *Background.* The increasing technogenic pollution actualizes the restoration of vegetation cover in many industrial regions of the planet, including the vicinity of non-ferrous metallurgy enterprises in the Kola Subarctic. The barrens podzols and abrazemes are unfavorable for plant development. The study is aimed at assessing the restoration of vegetation as a result of the mine lands remediation near the Severonickel industrial complex. *Materials and methods.* Remediation was carried out in 2003–2008 by two methods: chemophytostabilisation (without pretreatment of the soil) and overlapping of contaminated soils with organic matter-rich cover materials followed by liming, fertilization, seedlings planting and grass mixture sowing. The species composition and the projective cover of the vegetation, the vital status of the undergrowth, the aboveground phytomass of the ground cover and the thickness of the upper soil layer were evaluated at 11 monitoring sites taking into account spatial variation. Areas of barren lands were considered as control. For the evaluation and graphical display of the characteristic features of the vegetation variability, the principal component analysis (PCA) was used. *Results.* According to the state of the vegetation, the chemophytostabilisation sites only slightly differ from the control barrens sites due to adverse edaphic conditions. Planted trees and shrubs have a strongly depressed appearance and a low projective cover, and the ground cover is not restored. On remediation sites with organic matter-rich fertile layer, sparse deciduous young stands are formed with a predominance of goat willow and / or fluffy birch, with a higher level of tree vitality and species diversity, grass cover with the participation of grass and / or horse-tail. The PCA revealed an objective fractioning of sites according to the vegetation condition depending on the remediation technology. *Conclusions.* Successful restoration of vegetation in mine lands in conditions of emissions reduction depends on the state of the soil and the technology used. Environmentally friendly and cost-effective chemophytostabilisation gives only a short-term effect that needs continuous maintenance. A more promising but expensive way to quickly restore the barren lands is to apply a constructed fertile layer to the surface of polluted soils in combination with the planting of deciduous trees and the sowing of perennial grasses.

Keywords: restoration of vegetation, remediation, chemophytostabilisation, barren lands, soil degradation.