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MULCHING AS A TECHNIQUE OF RESTORING AND PROTECTING BIODIVERSITY OF MAN-MADE LANDSCAPES

МУЛЬЧУВАННЯ ЯК СПОСІБ ВІДНОВЛЕННЯ ТА ЗБЕРЕЖЕННЯ БІОРІЗНОМАНІТТЯ ТЕХНОГЕННИХ ЛАНДШАФТІВ

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Traditional approaches to the restoration of degraded areas include technical and biological reclamation. Biological reclamation means agrotechnic and phytoameliorative measures aimed at restoring and supporting sustainable ecosystem functions with the ultimate goal of economic and agricultural values of lands recreation [7, p. 13].

Modern approach to biological reclamation and restoration of destroyed areas is near-natural restoration [7, p. 9], one of the crucial results of which is the establishing of high-diversity plants communities and as a consequence – restoring ecosystem balance [2, p. 12]. Due to mitigation and remediation properties of plants, vegetation development within near-natural restoration functions as the remediation factor for reducing impact of the pollutants on the area [2, p. 12; 8, p. 15]. Within numerous approaches of near-natural restoration one of the most effective method of maintaining biodiversity is mulching [5, p. 158], however, in the context of man-made landscapes, this method has not yet been investigated and needs further research and testing.

The basis of near-natural restoration is revegetation through supporting, control and management of natural colonization process [3, p. 1527]. Pioneer species that colonize disturbed areas often have a key role in revegetation as they add organic nutrients and ameliorate surface temperature and in future it helps to establish more demanding species [1, p. 252]. The best nurse plants for phytorecultivation of destroyed territories are native species, which are considered the keystone elements of ecosystem [3, p. 1528]. Applying of seed mixtures, especially that ones based on native species, is widely used for revegetation, which significantly

accelerates vegetation development and lead to a significantly higher biomass production in the first year of implementation [4, p. 203].

Implementation of mulching with hay means the immediate hay transfer from a species-rich donor site in the time of seed ripening [9, p. 3]. Selection of donor sites for gaining species of rich hay is crucial for achieving restoration success, so we consider that the best donor sites could be nature conservation areas.

Adding weed-free mulch supports restoration process via seed mixtures applying, as it offers benefits for successful seed germination: provides physical substrate and protection for the seeds, reduces soil erosion and retains moisture [6, p. 287]. Moreover, it provides additional local native seed if local native hay is used. The application of green hay accelerated vegetation development and led to the rapid establishment of species-rich grasslands [5, p. 159; 6, p. 294]. The treatment with hay transfer and mulching leads to deep plant community changes: it helps to form dense plant cover and even can stop current succession. If the succession is not stopped, the plant community changes, e.g. ruderal species cover decreases with increasing of native species at the same time [1, p. 255]. Such techniques also support biodiversity of vertebrates, pollinators and other biota on restored sites.

To sum up, we consider that the sowing of regional seed mixtures together with hay transferring and other management measures are appropriate restoration measures within near-natural restoration to achieve successful revegetation and restoration of man-made landscapes. Final result of the implementation of near-natural restoration techniques will be self-sustaining plant communities with predominance of native species – it will support local biodiversity and at the same time mitigates the negative impact of man-made factors.

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