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A Case Study on a Trial Site in Western Austria to Assess Benefits of Railway Lineside Vegetation

Stephan Hoerbinger (1) and Michael Obriejetan (2)

(1) alpS – GmbH, Innsbruck, Austria, (2) Institute of Soil Bioengineering and Landscape Construction, University of Natural Resources and Life Science, Vienna, Austria

Lineside vegetation along railways can provide a wide range of ecosystem services and benefits. At the same time, there are several specific demands on the vegetation systems ensuring maintenance of highest standards of safety and operational performance. As a first step of the study, these demands on lineside vegetation but also their potentials for both rail specific internal and external benefits were summarized.
For further analyses a case study was performed. A trial site, located in Austria′s western federal state of Vorarlberg, was selected. The overall trial corridor was 22 km long and offered a large diversity in geomorphology, embankment types and surrounding land cover. A GIS-based classification of location types was conducted by using available open source geodata. Additionally, images, taken every fifty meters by a camera, mounted on a locomotive, supported the classification process. Following parameter were assessed: type of the track body, geomorphology, site conditions, technical facilities and surrounding land cover.
Along railway infrastructure facilities, ecosystem services, provided by the lineside vegetation, are closely associated with improvement of the stability and resilience of embankments and cuttings. At the same time, specific criteria that must be fulfilled at every location type. These are safety and technical issues, such as keeping the railway clearance profile, economical issues respectively avoiding additional maintenance costs by strong plant growth. Supplementary ecosystem services are strongly related to the position in the landscape and the surrounding land cover. Along urban structures, that can be noise- or sight protection, provided by the lineside vegetation. On location types along agricultural land, lineside vegetation can provide ecological corridors or enhance the landscape structure.
In this context, ecosystem services were derived to the previously assigned location types. The result of the case study is a GIS-based map tool, which screens the spatial distribution of ecosystem services, provided by the lineside vegetation systems.