



Accelerating raised-bog restoration in a nutrient-rich environment through moss transfer – OptiMuM – a new project to improve restoration practice in Germany

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Raised bogs are among the most threatened habitats in Northern Germany. Drainage-based land use has caused a shift to grassland vegetation on more than half of former raised bogs. In addition, high greenhouse gas (GHG) emissions from these areas counteract the aims of the Paris Agreement. Because all GHG emission reduction pathways require the so-called “land sink”, the pressure to restore former raised bogs under agricultural use as a nature-based climate solution is constantly increasing. However, since the mid-1980s most restoration projects have been carried out following peat extraction, whereas raised-bog restoration following intensive agricultural use is relatively new. Therefore, experience for successful restoration in a nutrient-rich environment is scarce.

In German restoration practice, topsoil is removed to build cell bunds for water retention simultaneously resetting biogeochemistry (at least on some parts of the area) to more favorable conditions for raised-bog vegetation. An active water management similar to peat moss paludiculture is usually not feasible in large scale restoration, because the goal is to create a self-regulating ecosystem with minimal maintenance need after restoration. However, contrary to e.g., Canadian restoration practice, active introduction of a moss layer is currently not a standard measure, because donor material is essentially missing or strictly protected. Therefore, the return of raised bog habitats to an agricultural landscape strongly depends on nearby refuges of raised-bog species.

Here, we present our new project “OptiMuM”, with which we aim to explore if, with relatively little additional effort, it is possible to speed up the restoration of raised bog habitats through varying degrees of active introduction of bog species under common German restoration practice. We selected three study sites across Northern Germany of which two are already rewetted without active introduction of bog species and one which will be rewetted within the project. On all sites we want to test the effect of active introduction for the restoration success and compare it to the development of areas within the sites without active introduction of bog species. On one site, we

also want to test the additional effect of an active water management similar to peat moss paludicultures on the restoration success.

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