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# Learning's From Opportunistic Wetlands: The Role of Substrate and Landscape Position On Reconstructed Landforms

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Wetlands are important features in large-scale mine reclamation projects, and are integral to sustaining landscape eco-hydrological function and meeting reclamation goals. Despite a sub-humid climate, opportunistic wetlands occur on reconstructed landforms, and along with designed wetlands present an opportunity to understand the requirements for wetland construction and their role in functioning landscapes. The relative occurrence and location of wetlands on newly reclaimed landscapes and the relative importance of site and landscape-scale factors in determining initial wetland formation was studied using a random transect survey approach to characterize wetland extent, soil parameters, and landscape physiographic position across three reconstructed landforms with contrasting substrate textures. The observed frequency of wetlands was higher than anticipated as wetlands formed in areas planted for forestlands, with an overall wetland density and percent cover of 0.77 wetlands/ha, and 7.6%, respectively. Wetlands found across all material types were complexes predominantly of Salix sp. Swamps, and Carex sp. Marshes, and minor coverage of with Typha sp. Open water marshes. No relationships were observed that indicate wetland formation was restricted to lower landscape elevations and potential cumulative water source, nor with landform aspects and higher shading potential. Rather, substrate and soil texture used in constructing landforms was important in determining the significance of site and local landscape factors in wetland occurrence. On fine-textured constructed landforms, regardless of landscape position, wetlands formed on flat areas and in shallow depressions where soils had low water storage that promoted frequent surface saturation. Wetlands on coarse-textured landforms were controlled by landscape-scale factors, being restricted to the toes of slopes and areas intersecting the groundwater table. These findings have important implications for understanding spatial differences in wetland development, the relative influence of internal feedback mechanisms and external sources in the initial phase of wetland formation and land paludification, and will aid the development of a geomorphic framework to better inform wetland construction and promote sustainable forest-wetland complexes similar to those found in natural landscapes.