

A COMPARISON OF SOIL CONDITION, VEGETATION COMMUNITIES, AND SOIL REDOX CHARACTERISTICS OF SURFACE MINED WETLANDS AND NATURAL WETLANDS IN SOUTHERN ILLINOIS¹

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Abstract: Wetland ecosystems along Galum and Bonnie Creek were relocated at the Burning Star #4 mine in Perry County, Illinois during surface coal mining (1983-1998). By 2001 the riparian wetlands were reconnected to the restored Galum and Bonnie Creek channels. A study was conducted in 2012 to compare soil condition, vegetation, and soil redox characteristics of mined wetlands to nearby natural wetlands. Soil samples were collected at 0-15 cm and 15-30 cm depths from eight mined wetlands and four natural wetlands and analyzed for soil organic matter, total carbon, bulk density, soil texture, total nitrogen, extractable phosphorus, and pH. Percent cover of each plant species present was determined using 0.25 meter quadrats. Soil redox characteristics were analyzed using IRIS (Indicators of Reduction in Soils) tubes. In addition, a smaller number of 90 cm soil cores were extracted using a gouge auger and described based on the soil texture, color, aggregation, and carbon content of each soil. Preliminary results indicated no significant difference in soil organic matter content and bulk density in the top 15 cm between the forested mined wetlands and natural wetlands, but below 15 cm, organic matter was higher and bulk density lower in the natural wetlands. Emergent marsh mined wetlands were significantly lower in organic matter and higher in bulk density than the natural wetlands in both the upper and lower soil samples.

Additional Key Words: Wetland Biogeochemistry, Soil Pedogenesis, Wetland Restoration

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