

DEVELOPMENTAL ECOLOGY – ECOSYSTEM ONTOGENY AND BOND RELEASE¹

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Abstract. Faced with the need to pass judgment on the vegetational adequacy of surface coal mine reclamation, all interested parties are well advised to take heed of the evidence provided by monitoring, suggesting that processes by which native ecosystems came to be are complex beyond original “plant-a-garden” reclamation techniques and regulations. Over the past 30 years, techniques have evolved considerably toward the end of producing vegetation more closely compliant with requirements for plant cover, forage production, woody plant density, and species diversity. This evolution has been driven by the need to balance plant competition between the major species involved in provision of cover and production (mostly grasses) with the usually much more weakly competitive woody plants and native forbs. Environments in which most surface coal mine revegetation passes through its infancy can only be described as ideal for herbaceous species and grasses in particular. Homogenized topography with even depths of agriculturally suitable soil offers what can only be termed a grass vision of heaven. In recent years a significant number of mines have undertaken to render conditions of reclamation landscapes less perfect for grasses in order to effect a balance of lifeforms more compatible with bond release goals. These trials may result in a shortening of the period of development needed to reach desired lifeform balances. On older reclamation, however, the favored balance is out of reach until stresses to the dominant grasses allow the establishment of forbs and significant shrub / tree cover. This will probably occur over a period much longer than a ten-year liability period or even the 20+ years that some revegetation has already been in place. Over the long term, conditions of climate and human management, among other variables, will change, perhaps disadvantaging the “ruling” grasses. It is posited that the species composition / balance of pre-mining plant communities to a large degree reflects the cumulative effects (a “developmental ecology”) of stresses and readjustments between plant lifeforms and species. Evaluation of the adequacy of some older revegetation efforts necessitates consideration of the question of whether low levels of woody plant density and forb abundance represent an adequately established potential for development of more shrubby and species –diverse vegetation in the longer term.

¹Paper was presented at the 2003 National Meeting of the American Society of Mining and Reclamation and the 9th Billings Land Reclamation Symposium, Billings MT, June 3-6, 2003. Published by ASMR, 3134 Montavesta Rd., Lexington, KY 40502.

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