



Financial viability of reforesting reclaimed surface mined lands, the burden of site conversion costs, and carbon payments as reforestation incentives

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Abstract

US Federal law mandates that mined land be returned by mine operators to a condition capable of supporting its pre-mining use or a higher use. Previously forested lands have commonly been reclaimed to hayland/pasture or wildlife habitat, and most of these lands have been abandoned from management and rendered non-productive. This situation has left landowners in the position of converting these reclaimed mined lands to forests at a later date, if they choose to make them economically productive. Such land-use conversion, however, comes with a substantial up-front cost to the landowner, which makes the financial viability of such a conversion questionable. We examine the financial viability of reforestation of these previously reclaimed mine lands by calculating land expectation value (LEV) under a range of conditions that include forest type, site quality, and reforestation intensity. We find that conversion to white pine is viable on higher quality sites under low to moderate interest rates with low or high timber prices, but conversion to mixed hardwoods is only profitable under the high price scenario with low interest rates, and only on higher quality sites. We also consider the implications of a shift in reforestation burden from the landowner to the mine operator, and results suggest that including costs of reforestation as part of the mining operation creates a financially viable forest enterprise for landowners under all scenarios for both white pine and mixed hardwoods. Two forms of carbon payments that could encourage reforestation of previously reclaimed mined lands also are examined: an annual payment based upon the total accumulated carbon found on-site in a given year, and an annual payment based on only the increment of carbon storage each year. Our carbon payment results indicate that annual values of up to \$55.17 per ton of carbon stored in hardwoods and \$9.39 per ton of carbon stored in pines would be required to make reforestation profitable under the poorest conditions (high interest rates, low prices, and poor quality site) when the payment is based on accumulated on-site carbon, although lower values are required under more favorable scenarios. Payments that are based upon the annual increment of carbon must fall in the range of \$8.66–\$71.88 per ton of carbon stored in hardwoods and \$0–\$83.29 per ton of carbon stored in pines to make reforestation financially viable.

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Introduction

Public Law 95-87, the Surface Mining Control and Reclamation Act of 1977 (SMCRA), mandates that surface mined land in the United States be returned to a condition capable of supporting its pre-mined use or one of higher value, and that the land be reclaimed in a fashion that renders it at least as productive after mining as it was before mining. In the central Appalachian mountain region, where prime farmland

and economic development opportunities for mined land are scarce, the most practical land-use choices are forestland, hayland/pasture, or wildlife habitat. However, since 1977, the majority of mined land has been reclaimed as hay land/pasture or wildlife habitat. This option may be chosen because it is less expensive than reclaiming the land to forest, the technological knowledge for reforesting is limited, or due to regulatory

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