

# Establishing Native Grassland Plants on Mineral Sands Mines in Virginia <sup>1</sup>

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**Abstract:** Mineral sands mining for ilmenite, rutile and zircon in southeastern Virginia results in compacted soils with low fertility and high variability in texture. Typically, land is reclaimed to upland pasture and often returned to row crop agriculture, but there has been growing interest in using alternative vegetation to reduce maintenance requirements and benefit wildlife. In spring 2016 we initiated a study to assess the feasibility of planting native grassland species as low-maintenance, high-resilience pollinator plots. We created four seed mixes of native grasses, legumes, and forbs: a high diversity, high seeding rate mix (HDHR); a high diversity, low seeding rate mix (HDLR); a low diversity, low seeding rate mix (LDLR); and a low diversity, high seeding rate mix (LDHR). We established four replicates of each mix at two different mining sites (Brink and Concord), and have monitored vegetation establishment twice per growing season. Overall, vegetation cover is higher at Brink and dominated by planted grasses (*Schizachyrium scoparium* and *Panicum virgatum*) as well as *Coreopsis lanceolata*, while the lower vegetation cover at Concord is dominated by *Chamaecrista fasciculata*, and to a lesser extent, *Andropogon gerardii* and *Desmodium canadense*, all of which we planted. While native weedy species (particularly *Ambrosia artemesifolia*) represented the dominant cover in 2016, by 2017 and 2018 weed cover had decreased by over 75% and been replaced by our planted species. In general, high diversity mixes (HDLR and HDHR) had greater cover and richness of planted species and lower weed cover than the low diversity mixes (LDLR and LDHR), although lower diversity mixes resulted in greater planted legume richness by 2018. We have observed no differences in any of our cover or richness metrics that resulted from seeding rate, suggesting that native plant establishment could be more affordable than expected. We hope these preliminary results may encourage the planting of native pollinator plots on other reclaimed mine soils in the Coastal Plain region.<sup>3</sup>

Additional Key Words: Revegetation, plant diversity, seeding rate, pollinator plant species.

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  3. Work reported here was conducted near 36°46'33" N; 77°34'55" W and 36°37'10" N; 77°38'16" W.