Evaluating Herbicide Treatment Effectiveness Using GPS Treatment Data & ArcGIS tools: 2016-2018[1]

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Abstract: A reclaimed coal mine (southwestern United States) has performed noxious weed management at various levels of intensity during the life of the mine. Noxious weed herbicide treatments have been conducted since 2010, with emphasis on larger, higher density infestations. In 2017, SMCRA regulatory agencies required an evaluation of herbicide treatment effectiveness. Since 2016 herbicide spot treatments have been recorded with environmental grade GPS units. Precipitation records and herbicide treatment data were used to quantitatively evaluate treatment effectiveness. ArcToolbox Fishnets were used to characterize treatments and perform a Grid Pattern Analysis for treatment effectiveness evaluation. Fishnets were symbolized using quantitative values and three classes (low, medium and high) to display density of noxious weed herbicide treatments. Data was exported to Excel for tabular analyses. This process was repeated for each treatment year and mining area. GIS modeling resulted in an efficient method for numerically and visually characterizing the effectiveness of noxious weed herbicide treatments. This method has now been used to evaluate three years of treatment data (2016-2018). The analyses indicate that herbicide treatment of noxious weed infestations has been effective, although reduction in weed populations due to significant drought has not been quantified.[3]

Additional Key Words: Southwest United States, Invasive Species, Fishnets, MS Excel.

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1. Oral paper presented at the 2018 National Meeting of the American Society for Mining and Reclamation, Big Sky Resort, MT: Welcome Back to Montana: The land of Reclamation Pioneers, June 3-7, 2019. Published by ASMR: 1305 Weathervane Dr., Champaign, IL, 61821.
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3. Work reported here was done near 35.669, -108.996.