

Prescribed burning as a tool to shift a reclaimed tailings storage facility dominated by agronomic grass to a native plant community

Brandon Williams¹, Wendy Gardner^{1,2}, Lauchlan Fraser¹

¹ Thompson Rivers University, Department of Natural Resource Science, British Columbia, Canada
Brandonwilliams@protonmail.com

Mine reclamation and closure plans have historically focused on returning disturbed lands to a vegetative community, often without consideration of the pre-existing natural vegetation, resulting in sites dominated by non-native agronomic species. Regulatory standards and community stakeholders now place more value on ecosystem function and native biodiversity. Once established, agronomic grass communities often dominate, restricting native species, and enter a stable state with little successional advancement. Large scale disturbances, notably fire, have historically structured grasslands and can alter successional trajectory. We tested the effects of prescribed burning in a 24-year old mine-reclaimed, agronomic-dominated closed tailings storage facility as a means of shifting an agronomic community to a native grassland. A variety of factors including fuel loads and moisture levels affect fire severity and the biotic recovery following disturbance. Our objectives were to test the effects of prescribed burning in the field and in a controlled greenhouse experiment to assess: a) plant biodiversity; b) soil nutrients; and c) native plant ecosystem reclamation. Fire severity was modified within the greenhouse trial at three levels (high, moderate, low) and held constant (moderate) in the field. Fire severity adjustments were made via modifying the fuel load and time of burning per treatment. Plant community composition shifted as a result of the burning treatment. Greater effects were found in the greenhouse trial, likely due to better control of the burn, such that native species colonization was observed. Our experiment provides a novel approach in mine reclamation.