

Remediation of Tar Creek: Shifts in Bird Community Composition over Time¹

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Abstract: The Tar Creek Superfund Site in Picher, Oklahoma was once the world's largest lead and zinc mining areas. Since being declared a Superfund site in 1983, large-scale remediation efforts have occurred throughout the landscape, such as cleaning up mining waste (chat), soil replacement, and planting native grass mixtures. In this study, we asked how habitat remediation of a heavy-metal contaminated area influences wildlife habitat and bird community composition over time. In 2017 and 2018, we surveyed 24 locations at the Tar Creek Superfund site in various stages of remediation, from no remediation to 5-years post-completion. We sampled each location's bird communities in May – July through three, 5-minute point count surveys, and analyzed community data through Bray-Curtis ordination plots, and a series of regression and ANOVA analyses. We evaluated habitat resources by measuring ground vegetation cover and composition, canopy cover, and shrub and tree species composition. We observed 69 bird species across the mined area, with an average of 15.8 species per site. The remediated locations were composed of grasses and forbs, in contrast to the un-remediated locations dominated by chat and/or trees and shrubs. Remediation efforts attracted significantly more bird species to the sites, particularly for sites with more grass and forb cover; however, some sites without remediation provided adequate habitat resources and hosted diverse bird communities. Sites in construction or sites with bare ground had the least amount of bird activity, highlighting the importance of leaving the ground bare for as little time as possible throughout remediation efforts, especially during the breeding season. Species composition differed across remediation category, with a shift from forest to grassland bird species throughout remediation efforts. Field data collection is ongoing for the 2019 summer breeding season and future efforts include abundance modeling for key species impacted by remediation efforts.³

Additional key words: ecology, plants, habitat

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 3. Work reported here was conducted near 36°58'32"N, 94°50'17"W.