Effects Of Road Culverts On Eastern Montana Prairie Fish Assemblages

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Road culverts can restrict passage of fish migrating between seasonal habitats. The development of new roads, as well as the repair and upgrade of existing roads, has led to research addressing the effects culverts have on fish populations. The majority of this research has

focused on salmonid species, and the effect of culverts on movements of small-bodied, weak swimming species is largely unknown. Fish passage within a species-rich assemblage of prairie fishes was examined in two tributaries of the lower Yellowstone River having a variety of culvert types. Passage restriction at culverts was determined using a combination of existing fish passage models, mark-recapture experiments, and patterns of longitudinal fish distribution above and below culverts. Fish movement was not significantly different through culvert versus natural reaches for most species ($P > 0.05$). Additionally, few differences were observed in relative abundance and species richness above and below culvert crossings. A survey of culverts throughout much of eastern Montana showed that the conditions observed in study culverts were typical of many low-gradient, prairie streams. Many culverts had small outlet drops, low gradients, contained natural substrate, and low water velocities similar to those of natural reaches. Our results suggest that in these conditions, culverts may allow for adequate passage of most prairie species. However, more research is needed to determine what thresholds in these variables negatively influence passage of prairie fishes.