Coalbed Natural Gas Development in the Powder River Basin: Implications for Warmwater Stream Fish Assemblage

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The Powder River Basin in Wyoming and Montana is currently undergoing one of the world's largest coalbed natural gas (CBNG) developments. Because CBNG development involves production and disposal of large quantities of coalbed ground water that differs from surface waters, potential exists for substantial effects on aquatic ecosystems. Coalbed natural gas product-water typically has high concentrations of dissolved solids, including elevated levels of sodium and bicarbonate ions. Information on chronic toxicity of CB G product-water to warmwater fishes is lacking, presenting a substantial gap in predicting the effects of saline discharges in the Great Plains ecosystem. We employed three different approaches to determine the effects of coalbed natural gas development on fish assemblages in streams of the Powder River Basin in 2005. First, we compared fish as emblages in streams with CB G development and streams without development. Second, we compared the longitudinal distribution patterns of fish assemblages at multiple points above and below CB G development. Finally, we compared fish assemblages present in 2005 to fish survey data from the mid 1990s in areas with and without CB G development. Streams in drainage

with CBNG development had an average of less than 4 species/stream whereas those without development had an average of 5.4 species/stream.