

Field Investigation of Hydraulic Structures Facilitating Fish Abundance and Passage through Bridges in Western Iowa Streams

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ABSTRACT

The overarching goal of the proposed research was to evaluate the hydraulic performance of 22 fish passage structures located in close proximity to bridges in western Iowa and within the Hungry Canyon Alliance territory. Such structures include riprap weirs, fish ladders, and grouted ripraps. The hydraulic performance of the aforementioned structures was evaluated via detailed field tests for a range of flow conditions relevant to fish migration through bridge waterways in different streams in western Iowa. The best performance, without considering the drainage areas, was exhibited by the low-gradient grouted or riprap weirs or by the fish ladder with baffles. The medium-gradient weirs also performed satisfactorily. Considering also the drainage areas, it is recommended that when the drainage areas are less than 20 square miles, the best structure is the low gradient; when the drainage areas are between 20 and 100 square miles, the best structure is either the low or medium gradient; and when the drainage areas are larger than 100 square miles, the best ones are the medium gradient.

Key words: fish ladders—grouted ripraps—hydraulic performance—riprap weirs