

Development and Application of a Sediment Risk Index for Unpaved Road Stream Crossings

Unpaved road-stream crossings can have significant detrimental effects upon stream morphology, stability, and biota; and are primary targets for restoration and watershed management plans. The objectives of this study were to develop a methodology for prioritizing unpaved road-stream crossings, and apply this model to the Choctawhatchee watershed in southeastern Alabama. Field surveys of 125 stream crossings included 83 metrics related to waterway conditions, crossing structures, roadside soil erosion, and road approaches. Statistical analyses reduced these candidate metrics to a final selection of 12 that form the sedimentation risk index (SRI). The SRI was organized into narrative categories (excellent, good, fair, poor, and very poor) based on the distribution of scores. No excellent sites (scores ≥ 55) were found in this study, 17 (20.7%) were good (low sedimentation risk), 37 (45.1%) were fair (moderate sedimentation risk), 26 (31.7%) were poor (high sedimentation risk), and two (2.5%) were very poor (high sedimentation risk). There was no significant difference in SRI scores among crossing structure type (round culverts, box culverts, and bridges) ($H = 4.31$, $df = 2$, $p = 0.058$). Further ongoing application of the SRI includes continued data collection of the Choctawhatchee watershed, and integration with a watershed assessment plan of the Yellow River in Florida and Alabama. Additionally, the SRI is currently included within pre- and post-implementation data collection and monitoring protocols involving various unpaved road-stream crossing stabilization projects in northwest Florida.

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