Urban Flood Demo Program & Southwest Demo Program

US Army Corps of Engineers®

Habitat Modeling for Middle Rio Grande Silvery Minnow

Products

A Rio Grande Silvery Minnow (RGSM) physical habitat module (based on CCHE2D hydrodynamic and morphodynamic data) will be provided to the U.S. Army Corps of Engineers, Albuquerque District, and to other interested stakeholders. The habitat suitability criteria will also be provided along with a technical note and a technical report describing simulation results.

Benefits

The module will assist Rio Grande stakeholders in managing the recovery of the endangered silvery minnow. The habitat module will be transferable to other systems and species.

Issue

The RGSM is listed as endangered under the Federal Endangered Species Act and by the states of New Mexico and Texas and the Republic of Mexico. RGSM were historically abundant throughout the Rio Grande Basin, but now only occur downstream of Cochiti Dam to the tailwater of Elephant Butte Reservoir (designated as critical habitat). The decline of this species is primarily attributed to hydrologic manipulations caused by extensive diversions and impoundments. Further habitat degradation has resulted from stream channelization, loss of floodplain connectivity, invasive species, and watershed and riparian degradation. Several regional planning efforts, including revisions to the Silvery Minnow Recovery Plan, modified hydrograph studies under the 2003 Biological Opinion, and Bosque restoration, require improved tools to inform policy, design, and management decisions.

Description

The objective of this study is to develop a habitat evaluation module for CCHE2D and other hydrodynamic/morphodynamic models and to apply the module to RGSM in order to evaluate alternative restoration scenarios. This work is being completed in conjunction with a two-dimensional sediment transport modeling task. A set of knowledge rules have been developed describing RGSM habitat preferences based on previous monitoring efforts by University of New Mexico (UNM) researchers. A physical habitat module has been produced to evaluate the habitat suitability as predicted by hydrodynamic and morphodynamic models. Following the completion of the CCHE2D hydrodynamic on a separate task, the habitat module will be combined with the knowledge rules to evaluate RGSM habitat availability in the middle Rio Grande. Finally, alternative flow and restoration scenarios will be tested to evaluate optimal restoration conditions. Flow conditions near the city of Albuquerque diversion structure will also be evaluated.

Fish passage channel at city of Albuquerque diversion dam

Sponsor

Urban Flood Damage Reduction and Channel Restoration Development and Demonstration Program for Arid and Semi-Arid Regions (UFDP).

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