FHWA Exemplary Ecosystem Initiatives

Information Sheet

Initiative Name: Allegheny River Freshwater Mussel Studies

Initiative Location: Upper/Middle Allegheny Drainage, Pennsylvania

Initiative Description: (provide background, purpose and other information that can demonstrate how the project or activity is consistent with the FHWA Selection Criteria for Exemplary Ecosystem Initiatives)

Since the mid-1990s, the Pennsylvania Department of Transportation (PennDOT) has been extensively involved in informal and formal consultation processes for bridge replacement projects in the Allegheny River Drainage. Due to 1) extensively limited knowledge of the densities of freshwater mussels in the Upper and Middle Allegheny River in Pennsylvania, and to limited knowledge regarding the success of best management practices, prudent and reasonable measures (mitigation measures) and conservation opportunities the United States Fish and Wildlife Service (USFWS) and PennDOT faced the potential for multiple bridge replacement projects to be considered “jeopardy” to two federally endangered species. In order to improve best available scientific data, document success of best management practices and prudent measures and to identify cost effective and successful practices and measures, PennDOT embarked on several studies of freshwater mussels in the Allegheny River. In combination, these studies represent a comprehensive effort that advances our knowledge of these species, their role in the ecosystem, minimization of impacts and best practices.

To address the limited best available scientific data and to document suspicions that the abundance of these animals was greater than known PennDOT partnered with the United States Geologic Survey, Biological Resources Division (USGS-BRD) to conduct comprehensive qualitative and quantitative surveys of the Upper/Middle Allegheny River. Four years of surveys have been completed with one year remaining to complete the study. Fifty two sites have been surveyed qualitatively and 13 sites quantitatively with additional quantitative effort scheduled for the summer of 2006. As suspected, mussel densities in the Allegheny River are greater than previously known. Twenty four (24) species have been identified during the survey to date. Mussel density estimates in the first river section of the study (approximately 40 river miles in length) are approximately 28 million for all species and over 7 million for the two endangered species. Mussel densities have not been estimated yet for the second river section but based on qualitative results the estimates will far exceed those of the first river section. These results will now be the basis for future Section 7 consultation decision-making for USFWS and PennDOT.

Several mussel relocations associated with bridge replacements on the Allegheny River have been competed and extensive monitoring of relocation success and re-colonization of impacted areas was undertaken by PennDOT and USGS-BRD. Again, the results have been positive with documented successes in relocation and re-colonization far exceeding expectations in impact areas. These results provide new information useful in the development of best management practices and prudent and reasonable measures for bridge/freshwater mussel conflicts.

In partnership with USGS – Water Resources Division (USGS-WRD), hydraulic studies utilizing acoustic Doppler technologies are underway to create predictive models for freshwater mussel habitat. This technology is also being utilized to monitor hydraulic modifications to the river bed as a result of bridge pier location and design and to monitor impacts of bridge removal and replacement. These studies, also underway are anticipated to be useful in the development of design and construction measures that minimize impacts to freshwater mussels and their habitats.
In partnership with USFWS – White Sulphur Springs National Fish Hatchery and the USFWS Ohio River Islands Dive Team, a mussel salvage and refuge (holding) was pursued. Captive care and propagation studies are underway at White Sulphur Springs. Physiological and feeding experiments have documented the role these species play in improving water quality in addition to identifying best practices for captive care. Results of initial propagation trials will be available this year. In addition, some common and candidate species have been transferred to research facilities in Ohio, Tennessee and Kentucky to support additional propagation and reintroduction studies. Potentially, animals identified as “take” for a PennDOT bridge replacement may result in the reestablishment of freshwater mussel species in other locations in their historical range in the Ohio River Drainage, a far reaching ecosystem benefit.

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