

American Water Resources Association
2009 ANNUAL WATER RESOURCES CONFERENCE
November 9-12, 2009
Seattle, WA

Wednesday, Nov. 11

3:30 PM – 5:00 PM

SESSION 51: Ecosystem Restoration/Mitigation

Missouri River Recovery Program: Progress and Challenges in Creating Shallow Water Habitat for the Endangered Pallid Sturgeon - Michael Gossenauer, U.S. Army Corps of Engineers, Kansas City District, Kansas City, MO

Beginning in the early 20th century, the US Army Corps of Engineers undertook congressionally authorized projects designed to change the face of the Missouri River to better provide for multiple beneficial uses including flood control, navigation, and irrigation. While the projects were successful in establishing a reliable navigation channel, a major unintended side effect was the loss of hundreds of thousands of acres of wildlife habitat, both terrestrial and aquatic. This led to the decline in population of multiple native species including the federally-endangered Pallid Sturgeon, and as a result, starting in 1981, the Corps began efforts to mitigate for this loss and restore habitat. For the last several years the Corps of Engineers has partnered with the US Fish and Wildlife Service and state game and fish agencies in a major effort to restore Shallow Water Habitat (SWH) on the Lower Missouri River to prevent continued jeopardy of the Pallid and to mitigate for lost aquatic habitat. While the Corps has made progress in the creation of SWH on the Missouri through the mechanical creation of side channel chutes, river top-width widening, and backwater excavation, the number and size of these projects have created new challenges in the management of displaced alluvial sediment in the banks and adjacent to the river. Issues with the reintroduction of sediment into the active river system, such as nutrient loads, contaminants, impacts on downstream interests, and public perceptions, illustrate the wide variety of topics that complicate the management of those sediments. The Corps is continuing to evaluate all options in an effort to manage sediment in the most beneficial and acceptable manner. In addition, the Corps has initiated an independent review of its practices by the Water Science and Technology Board of the National Research Council to help guide the future of SWH construction.

Development and Field Validation of an Indicator-Based Method for Evaluating the Duration of Streamflow in Oregon - Tracie-Lynn Nadeau, U.S. Environmental Protection Agency, Portland, OR (co-author: Parker J. Wington, Jr.)

In light of the U.S. Supreme Court's Rapanos decision and Justice Scalia's focus on "relatively permanent" tributaries, the U.S. Army Corps of Engineers (Corps) and U.S. Environmental Protection Agency (EPA) now place greater emphasis on determining the duration of stream flow in making Clean Water Act Section 404 jurisdictional determinations. Because there are many non-perennial streams in Oregon for which there are no reliable flow records, the Corps Portland District and EPA Region 10 Oregon Operations Office cooperatively developed a field assessment method that can be used to distinguish between perennial, intermittent and ephemeral streams in Oregon. The Oregon Streamflow Duration Assessment Method, released as an interim version on March 6, 2009, uses a suite of readily observed geomorphic, hydrologic, and biologic indicators representing a stream process or feature. Each indicator is assigned a numeric score using a weighted scale, and the flow duration is predicted based on the cumulative score for a given stream reach. The method may also provide a common technical framework to address other stream-related issues such as compensatory mitigation and stream function. To verify the method, EPA is conducting a study applying the method to 177 stream reaches in multiple hydrologic landscape regions across the state, during both wet and dry seasons, and comparing predicted and observed flow durations. We have completed data collection for both a dry and wet season sampling. We anticipate further verification to facilitate the transfer of this method for use across the Pacific Northwest.

Development of a Coordinated Watershed Approach For Linking Compensatory Mitigation and Tampa Bay Habitat Restoration Goals - Valerie Seidel, The Balmoral Group, Maitland, FL (co-authors: Chris DeBodisco, Paul Yacobellis)

While mitigation banks have been in use since the 1970's, little consideration has been given to their potential contribution toward watershed-level habitat goals. This paper sets out to document a Tampa Bay Estuary Program project, which has three objectives: quantifying freshwater wetland habitat changes in the Tampa Bay watershed, projecting future impacts to the watershed, and establishing watershed-level goals for habitat restoration and protection. The study began with GIS analysis and mapping of historical changes to freshwater wetland habitats from 1950 forward, using NWI and other source data. A combination of spatial analysis and scientifically-determined decision rule algorithms is then used to identify changes in extent and quality of wetland habitats. A Rapid Condition Assessment matrix is then applied to identify habitat quality and sustainability indicators, and existing conditions are assessed using this conditional matrix. Based on these assessments, habitat ratios are calculated and compared to historical habitat ratios. Ecological and hydrological assessment of future viability is conducted at the drainage basin and watershed level to identify the most desirable areas for future restoration. Econometric modeling, incorporating expectations of future land use patterns and relative values, is used to assess economic viability of various locations for future restoration and mitigation banking sites. Existing and planned compensatory mitigation was also included in this analysis. In the end stages of the study, partners are engaged through a series of workshops to refine the watershed level goals to specific activities and sites. Workshop discussions and literature reviews identified regulatory, political, financial or other constraints to achieving the program's goals. Private sector sources are used to determine marketplace willingness to support the program's goals through incentives and other means, and monitoring mechanisms to track the plan's success are being developed. This study brings ecological, hydrological, econometric and GIS expertise to establish viable long-term habitat restoration goals for the Tampa Bay Watershed. A significant benefit will be a 50-year plan to link compensatory mitigation and restoration efforts to optimal habitat restoration goals.

Natural Gas Well Drilling - Mitigating Impacts To Water Resources - Carol Collier, Delaware River Basin Commission, West Trenton, NJ (co-author: Chad Pindar)

Until last year I never heard the term Marcellus Shale. Now it is a priority in my day to day activities. The upper one third of the Delaware River Basin (the headwaters) is underlain by Marcellus Shale and other shale formations potentially rich with natural gas. Now that technologies have improved, it is possible to extract the gas with vertical and horizontal fracking of the shale formation. While the first oil well was constructed in Pennsylvania and the oil and gas industry is not new to our area, the process of extracting gas from these shales has potentially significant impact to water resources. The shales are approx. 6000 feet below the surface. To extract the gas, 2-5 million gallons of water, with additives to facilitate maintaining opening in the fractures, is forced down a well. As the gas is released, approx. 40 percent of the water with the additives is returned to the surface. This return water has a very high total dissolved solids (TDS) concentration due to the contact with the briny ancient shales. Water resource concerns include water withdrawals and impact on instream flows, well pad siting and maintenance, wastewater treatment and disposal. The Delaware River Basin is 13,500 square miles and provides water to 15 million people. Three quarters of the non-tidal river is in Federal Wild and Scenic River designation. The waters of the upper basin are pristine and the Delaware River Basin Commission (DRBC) protects existing water quality through a Special Protection Waters Program (antidegradation program). Our presentation will cover the potential impacts of the natural gas well drilling, new regulation of the gas industry, the need to protect the sensitive headwaters areas, coordination with the gas industry and local communities, and concern for cumulative impacts such as forest fragmentation. The contiguous forest in the Delaware headwaters currently protects both water quality and quantity for the river system. The shale gas industry has the potential to improve the local and national economy, but we must have the proper controls in place to protect our natural resources.

Creation of a National Coalition for Ecosystem Restoration - Cheryl Ulrich, Weston Solutions, Inc, Atlantic Beach, FL (co-authors: Tom St. Clair, David J. Tazik)

The Need. Recognition of the need for a National Coalition for Ecosystem Restoration (NCER) is not new, and transcends all political, state and agency boundaries. Recommendations from the National Research Council and the US Army Corps of Engineers Environmental Advisory Board stress the need for leadership in the ecosystem restoration arena in order to achieve success. In addition, attendees at past National Conferences on Ecosystem Restoration have requested some form of collaboration bridging their bi-annual conferences.

The Concept. The NCER would be an entity whose membership would consist of individuals from governmental agencies, academia, non-governmental organizations and the private sector. The initial goal of the NCER would be to connect all ongoing ecosystem restoration efforts and fill recognized knowledge transfer and communication gaps. The NCER will help enable a collaborative and holistic life-cycle approach to ecosystem restoration.

The Mission. The NCER will foster ecosystem restoration information and knowledge exchange via a web-based Knowledge Gateway. The coalition would also work with a variety of partners to formulate and advocate a national agenda for scientifically and technically sound ecosystem restoration practices. The focus will be on four primary areas with the following themes:

- Technical Tools
 - o Modeling and analytical tools supporting planning, design and operations
 - o Technologies supporting monitoring and adaptive management
 - o Technical standards and guidelines for ecosystem restoration
- Knowledge Gateway
 - o Knowledge sharing platform
 - o Training, developmental and job opportunities
 - o Roster of experts
- Policy and Planning
 - National policy communication platform
 - Adaptive management and monitoring policy
 - Plan formulation for watershed level restoration programs
- Partnerships and Networking
 - o Virtual ecosystem conference center
 - o Bi-annual National Conference on Ecosystem Restoration
 - o Promotion of active partnerships between government agencies and NGOs for individual restoration programs

Conclusion. The NCER will connect ecosystem restoration efforts across the nation and ultimately around the world. Effective communication, information exchange and advocacy efforts will promote sustainable ecosystem restoration practices and will ensure leveraging of ideas, data and methodologies. The goal is to move our nation forward as the leader in collaborative, holistic and life-cycle approaches to ecosystem restoration.