



Volume 2 Issue 3 Fall 2003  
Issued on a Quarterly Basis

## Inside this Issue

- 1 A Note from Headquarters
- 2 Regulatory Developments
- 2 Stream Management in North Texas
- 4 Riparian Mitigation
- 6 Riparian Areas: Functions and Strategies for Management
- 9 Of Interest
- 12 Newsletter Communication

U.S. Army Corps of Engineers  
Institute for Water Resources  
7701 Telegraph Road  
Alexandria, VA 22315-3868

# AQUATIC RESOURCES NEWS

## A REGULATORY NEWSLETTER

Headquarters, U.S. Army Corps of Engineers,  
Regulatory Branch

### *A Note from Headquarters*

For those of you that have not yet heard, improving the success of compensatory mitigation is one of my major goals for the program during the next five years. Improving compensatory mitigation will not be an easy task; there are two major components to this effort that I personally believe are critical to achieving success. The first of these components is to write ecologically driven, enforceable success criteria for Corps permits. I have personally seen too many "irrigated tree farms" based on the standard "95% survival of planted tree species after 5 years." We need to incorporate more Hydrogeomorphic Method (HGM) assessment tools and basic ecological parameters in permit conditions. Headquarters has tasked our Institute for Water Resources (IWR) to lead the effort, and you should expect to hear from them as they canvass the Districts with data requests and provide drafts for review.

The second component is that we do a credible job of documenting our impacts through our permitting process. However, we have not had the funding to really improve our tracking and compliance of compensatory mitigation. This was documented by the National Research Council report of 2001. We at Headquarters have been working hard to provide the justification for additional funds in the FY 2005 budget

to significantly improve compliance efforts. The most important point of this process is that we are developing new performance criteria tied to budget. If we don't get the expected budget, then we can't hold the field to these standards and compliance efforts will continue to suffer.

Additional efforts will also help with this 5-year goal. The National Wetlands Mitigation Action Plan (MAP) is in full stride and the field teams are being tasked with review of documents. The Corps is taking the lead on a number of the MAP action items including guidance on preservation and vegetative buffers. We will be working with IWR and the Engineer Research and Development Center (ERDC) on HGM models and its use in mitigation plans and success criteria. The OMBIL Regulatory Module (ORM) installation starts in October, and the long-term plans for GIS are underway. ERDC is also working on a mitigation tracking system for banks, in-lieu fee programs and onsite projects that can be tied into both ORM and geographic information systems. Expect big changes in the way we do business with regards to mitigation in the future. We believe these changes are definitely for the better and will provide the public with more predictability while showcasing our expertise in aquatic resource mitigation.

Mark Sudol  
[Mark.f.sudol@usace.army.mil](mailto:Mark.f.sudol@usace.army.mil)

### *Distribution of Aquatic Resources News*

The *Aquatic Resources News* will be distributed to field staff by email. The Newsletter will also be available on the IWR website within the month at:

<http://www.iwr.usace.army.mil/iwr/regulatory/regulintro.htm>

Or you may contact the Editor, Bob Brumbaugh, CEIWR-PD (703) 428-7069 [Robert.w.brumbaugh@usace.army.mil](mailto:Robert.w.brumbaugh@usace.army.mil). HQ point-of-contact for the newsletter is Katherine Trott, CECW-OR (202) 761-4617 [Katherine.l.trott@usace.army.mil](mailto:Katherine.l.trott@usace.army.mil)

## **Regulatory Developments: A Note from the Editor**

This is the third *Aquatic Resources News* issue addressing impact and compensatory mitigation assessment procedures. This newsletter presents a mix of articles, from stream management approaches and riparian resource appreciation to riparian wetland mitigation assessment. The newsletter includes problems associated with compensatory mitigation and a way to analyze mitigation success via functional assessment methodology, in this case, HGM. The mix of subjects mirrors the variety of resource issues and technical procedures under development. Natural resource science, functional assessment procedures, and decision support tools (e.g., geographic information systems (GIS)) are converging in a rapidly evolving arena that will enable regulators to make better decisions. Our regulatory chief, Mark Sudol, makes that point in his introductory note. This newsletter issue and others to follow will try to pinpoint information potentially useful to regulators. Thus, the editor encourages you to submit questions on these newsletter articles.

This issue presents the Fort Worth district’s effort to help local governments deal with stream impacts in rapidly urbanizing areas. The second article reports on a study of riparian wetland compensatory mitigation in the Los Angeles District. Using HGM, this study pointed out problems associated with such mitigation and ways to improve success. The third article reviews a recently released National Research Council Report, which looks at riparian areas, a resource of increasing interest to regulatory staff, especially in the semi-arid and arid western U.S. This newsletter concludes with (1) an update of the Federal Interagency Wetland Mitigation Action Plan (MAP), now at the end of its first year, and (2) a summary of the Mitigation Stakeholder Forum, which discussed the MAP status and potential products.

The next issue of this newsletter will continue to focus on impact and compensatory mitigation assessment, including a review of HGM application to wetland assessment. Subsequent issues will begin exploration of application of geographic information systems to the regulatory process. You are encouraged to suggest topics or submit articles for future newsletters.

### ***Stream Management in North Texas***

*Presley Hatcher, Jennifer Walker  
Norm Sears, and Joe Hickman*

Stream modification projects associated with residential, commercial, and industrial development on mostly ephemeral and intermittent streams have raised concerns in developing metropolitan areas, including many areas in Texas. These projects may result in individual and

cumulative adverse impacts to the aquatic ecosystem, including water quality degradation, aquatic and riparian habitat destruction, and flood storage reduction. In many cases, these projects are proposed to address problems such as erosion control, flood control, etc. However, the projects often do not solve the problem, but only transfer them to other parts of the stream and degrade what otherwise could have been valuable multi-functional resources for the community and the region. In many Texas cities this degradation is further compounded by drainage ordinances that require developers to replace natural streams with buried conduits or with straightened, sometimes hard-surfaced, channels for more efficient passage of water and easier “maintenance”.

Rapid urban expansion can aggravate the problem of stream degradation because there is generally insufficient time for adequate planning, budgeting or involvement of outside expertise. This is particularly true for Texas, which includes 3 of the 10 fastest growing cities of 500,000 or more, and 2 of the 10 fastest growing cities of 10,000 or more, in the United States (source: Fort Worth Star-Telegram). Of those five fast-growing cities in Texas, four (Fort Worth, San Antonio, Cedar Park, and Frisco) are within the Civil Works boundaries of the Fort Worth District of the U. S. Army Corps of Engineers (Corps).

The Fort Worth District’s Regulatory Branch has experienced problems and delays in processing numerous permit applications, primarily because there is no good framework available for evaluating the impacts on headwater streams and the lack of adequate guidance for watershed planning in the region. To address this problem, the district worked with the Engineer Research and Development Center (ERDC) and partnered with federal and state resource agencies, local governmental and planning authorities to develop a stream management program. The guidance developed by ERDC is in the form of a working draft handbook titled “Stream Management – Concepts and Methods in Stream Protection and Restoration and is available at:

<http://www.swf.usace.army.mil/regulatory/stream/stream.pdf>

The ERDC guidance was the first step of an initial, interagency, stream partnering effort. The overall partnering effort at that time consisted of doing the following:

- Refining the written guidance for stream management to ensure that its focus on avoiding adverse impacts when practicable, and implementing more aquatic ecosystem-friendly projects when avoidance is not practicable, was clear.
- Conducting workshops for local governments, developers and consultants in order to present the guidance to them and respond to questions about environmentally sound stream management. The

Corps sponsored two workshops in the Dallas-Fort Worth area, one in San Antonio, and one in Austin from 1998 to 2001.

- Encouraging demonstration projects to showcase applications of techniques presented in the guidance to protect and enhance the aquatic environment.

**Stream Team**

In 2000, EPA, the North Central Council of Governments (NCTCOG) and the Corps used the stream management approach as a basis for an effort to address the adverse impacts associated with a wide variety of stream modification projects in North Central Texas. They expanded the interagency team to include the Natural Resources Conservation Service, U.S. Fish & Wildlife Service, U.S. Geological Survey, Texas Parks & Wildlife Department and Federal Emergency Management Agency. The group became known as the “Stream Team”.

Many times a project is proposed to solve a flooding or erosion problem that involves a “hard solution” (e.g. channelization and concrete lining a stream channel). Such solutions can degrade or eliminate many of the aquatic functions of the stream (fish & wildlife habitat, water quality protection, and aesthetics) by removing all the natural vegetation. Sometimes a project on one reach of a stream will cause additional erosion or flooding downstream, which leads to more projects. Generally such impacts are long term or permanent. Many such projects over the years have greatly diminished the number of natural streams remaining in the Dallas-Fort Worth metropolitan area.

The Stream Team offers technical assistance to communities, developers, consultants, and any interested stakeholder, in order for them to consider non-structural, less damaging options for projects that could result in stream modification. This is done by providing them with an understanding of the value of stream ecosystems and examples of how their projects could be accomplished with less adverse impacts to the ecosystem. The Stream Team’s primarily purpose is to educate the target audience on the values of healthy streams and riparian areas and encourage stream protection, enhancement, and restoration from both a local and watershed perspective. While the Stream Team addresses issues associated with individual projects, it also seeks to provide environmentally preferable solutions on a watershed scale. The geographic limit of the Stream Team is 16 counties of North Central Texas covered by the NCTCOG.

The Stream Team, while flexible in how it approaches stream management, currently achieves its objective in the following three ways:

- Workshops or seminars on methods for protecting, enhancing, and restoring streams which can be community-focused, at the community’s request, or regional in scope. Five regional workshops have been conducted over the past two and a half years.
- Planning assistance to communities upon request. This is done by meeting with communities and listening to problems, visiting project sites and having brainstorming sessions to develop possible solutions. During the past two and a half years, the Stream Team has visited 15 communities. The basic approach is straight forward. The Team meets and formulates recommendations (e.g. a range of options) and then presents the recommendations to the community.
- Encouraging and participating in pilot or demonstration projects. The team can even help fund these projects where appropriate agencies have that capability. Currently two projects have been funded and are in the planning stage.

The Stream Team reviews project proposals only at the request of a project proponent or the Corps. This review is usually done early in the project planning process and before the proponent submits the proposed action as a permit application. The Team holds periodic meetings to listen to proposals. Plans may be submitted to Team members individually for review. The Team may meet later to discuss proposals and make a site visit if one would be helpful. The Team makes verbal recommendations to the project proponent. Individual Team members may send written comments or wait until there is a formal permit comment period if the project results in a permit application.

**Stream Team’s Structure and Operating Procedure**

The Stream Team is a multidisciplinary group, consisting of scientists and engineers with backgrounds related to the natural environment. The Stream Team encourages project proponents to also utilize a multidisciplinary approach when evaluating or formulating plans that involve streams. The Stream Team addresses a number of elements of stream management when responding to a request for input. These elements include: goal-setting; data collection; consideration of present and likely-future watershed dynamics; identification of existing and optimum conditions relative to such factors as gradient, bank-full event, channel sinuosity, soil type, and vegetation; and monitoring.

The intent of the approach used by the Stream Team is to offer stream management assistance in a less formal, non-regulatory setting. This may help project proponents consider, and develop, alternatives that are less damaging to streams early in the planning process, before they have committed resources to one particular design. For many of these projects, a Section 404 permit is still required from the

## Riparian Mitigation

Mark F. Sudol

*(From Success of Riparian Mitigation as Compensation for Impacts due to Permits Issued through Section 404 of the Clean Water Act in Orange County, California, Doctoral Dissertation, 1996, UCLA)*

Corps and other permits may be required by other federal, state, or local agencies. However, by considering less environmentally damaging alternatives early in the project planning process, there is a higher probability for an expedited review of the permit application. This is in keeping with the alternative analysis requirements of the Section 404(b)(1) Guidelines.

Recommendations that a project proponent receives from the Stream Team are non-binding, i.e. they have no regulatory effect, and are not necessarily the final or official agency position on a project. However, if the project eventually goes through the Corps' permit process and the recommendations were not incorporated into a revised plan, the project proponent may see the same or similar recommendations again.

The ability of the Team to work on a given number of projects is limited by the member's constraints of time and resources. The Team does not conduct detailed field investigations or perform work that could replace that done by consultants.

The Stream Team has provided input to many project proponents including cities, other governmental entities, and developers in Allen, Arlington, Cedar Hill, Cleburne, The Colony, Dallas, Denton, Fort Worth, Frisco, Grand Prairie, Grapevine, Haltom City, Highland Village, and Weatherford. One of the entities that sought Stream Team input was the city of Frisco. Frisco has developed a reputation as a "proactive environmentally-friendly community" even while growing from 6,000 in 1990 to more than 55,000 in 2002.

The Stream Team's efforts have resulted in a shift by all interested parties toward a more proactive approach, primarily by encouraging earlier consideration of less environmentally damaging, and therefore more readily permissible, projects. The Corps anticipates that these efforts will continue to result in an even more concerted effort among the parties involved to address the widespread problems associated with stream modification projects that degrade the aquatic ecosystem. There has been considerable progress in this regard, however, much remains to be done.

For additional information about the Stream Team and stream management efforts in North Central Texas, you may contact: Norm Sears, EPA, (214) 665-8336; Jack Tidwell, NCTCOG (817) 695-9220; or Jennifer Walker, Corps, (817) 886-1733.

*Presley Hatcher is Chief of the Permits Section of the Fort Worth District Regulatory Branch. Jennifer Walker is a Regulatory Project Manager in the Fort Worth District. Norm Sears and Joe Hickman are in EPA's Region VI office in Dallas.*

This study evaluated riparian habitat created, restored, or enhanced as compensatory mitigation for projects permitted through Section 404 permits issued by the Los Angeles District, U.S. Army Corps of Engineers in Orange County, California. The Hydrogeomorphic Methodology (HGM) was used to quantify mitigation success of riparian habitat mitigation. The results provided the first quantitative analysis of mitigation success that is both defensible and reproducible.

Riparian corridors exist as narrow ribbons cutting across the broad coastal plains and hill slopes of Orange County. There are several reasons why applicants are allowed to mitigate for riparian impacts, including wetlands, on irrigated upland sites. There are limited acres of riparian habitat in the County due to climate and geomorphology. In most cases, impacts to riparian habitat are small in relation to the entire project. The small acreage of riparian impacts and the need for some type of flood control limits the Corps ability to require the applicant to avoid impacts to riparian habitat. If a proposed project impacts one portion of a small riparian corridor, the applicant generally does not have the opportunity to avoid or minimize impacts. Once the Corps has been satisfied with attempts to avoid and minimize impacts, the applicant then examines possibilities for compensatory mitigation. In a developed county such as Orange, there are no areas in which to "re-create" a stream channel without impacting existing channels. In addition, existing channels that could be restored, enhanced, or preserved are generally owned by other private or corporate entities. With the high cost of real estate in the region, the cost of obtaining these areas for mitigation were generally too expensive and determined to be "impracticable" by the applicant in response to inquires by the Corps. The result has been the development of "riparian" habitat in areas without natural stream channels. Artificial hydrology consisting of irrigation designs and elaborate structures to hold and supply water has been constructed in an attempt to provide sufficient water for these riparian mitigation sites. The argument is made that although there is no natural hydrology, the availability of artificial irrigation will allow the development of successful habitat and there is no need for natural hydrology. However, with artificial irrigation, the vegetation lasts only as long as the water is turned on unless ground water is reasonably close to the ground surface.

The majority of constructed riparian sites have a permanent supply of water guaranteed "in perpetuity" by the applicant.

This is presumed to provide assurance that the tap will never be turned off and the irrigated field will never revert to dry, upland habitat. There are several problems with this assumption. First, issues related to non-compliance of mitigation sites can only be administered within the limits of the permit. If the monitoring time of the mitigation site has expired and the Corps has approved the mitigation site (in relation to the special conditions of the permit), there may be no legal recourse if the applicant removes the water and abandons the site. In addition, if the site was constructed in uplands, approved by the Corps, and then reverts to uplands, the Corps may not have any jurisdiction over the site because it does not meet the criteria for "waters of the United States." Unless the project has been required to post a long-term performance bond or letter of credit, there is generally no mechanism to enforce mitigation requirements if the permit has expired.

The second problem deals with those sites that have agreements with water authorities or other agencies to provide tertiary treated water to mitigation sites in perpetuity. These private or semi-private water authorities generally use excess tertiary treated effluent as a permanent source of water for several mitigation sites. However, the current problems with water supplies, past drought experience, and future predictions of water shortages make future availability of this source uncertain. As water prices rise due to increased demand in the Los Angeles area and elsewhere in the west, possible uses of reclaimed water will increase and the price the water authorities can charge for this water will likely rise. The ability of mitigation sites to continue to afford this water will decrease and may disappear entirely if tertiary treated water becomes needed for public water supplies. The Corps is beginning to question the use of "in perpetuity" when it relates to an artificially maintained supply of water for mitigation sites and has identified these concerns in several documents including the Mitigation Banking Guidelines.

HGM includes these hydrologic and biogeochemical functions for very good reasons. Riparian habitat is defined as: "pertaining to the terrestrial or emergent zone immediately adjacent to freshwater stream or river". In general, the stream or river provides a conduit for nutrients and organisms to pass into and out of the section of habitat. Streams or rivers are dynamic and constantly reshape the existing habitat by eroding some sections and depositing sediments in others. The dynamic nature of the habitat is the most critical aspect missing in artificially created riparian areas. There is little or no movement of materials or organisms into and out of the constructed habitat and there is generally no corridor for transport of organisms or nutrients. Fluvial processes cannot be recreated by regularly providing uniform volumes of clear water to a mitigation site. Without the dynamic process of storm flows and overbank flooding, there can be no sediment transport and nutrient cycling, two critical riparian processes that influence habitat upstream, downstream, and adjacent to the riparian zone. Lack of these important

functions results in a reduction of habitat value that is not addressed by examining solely vegetation structure over a short time period.

Another important aspect of past mitigation planning that was missing in these mitigation projects was the attempt to integrate each site into the surrounding landscape. Most of the sites examined can be considered island habitats with no direct connections to other riparian habitat areas and/or adjacent upland habitat. This limits the colonization and usage of these islands to biota in the remaining habitat areas. HGM includes only one variable that attempts to measure the connectivity of the habitat. Future modifications to HGM to include aspects of spatial analysis through the use of a geographic information system (GIS) may increase the importance of this variable and possibly its addition as a function of the habitat.

The results of this evaluation represent a first attempt to use HGM to evaluate past mitigation sites. These data indicate a significant lack of success associated with past riparian mitigation sites in Orange County. This study determined a net loss of 241 acres of riparian habitat in Orange County between 1986 and 1992 due to the lack of success of compensatory mitigation projects proposed to offset project impacts. The fact that no compensatory mitigation site was determined to be successful by HGM analysis indicates a potentially serious problem with past mitigation policy, requirements, and compliance efforts. However, when data from a determination of mitigation success based on permit special conditions is compared with the results of the HGM analysis, it becomes clear that even a concerted compliance effort would not have made these past projects more successful. However, if an effort is made to improve mitigation objectives and design criteria by inclusion of functional assessment methodology, then an increased monitoring program could be useful to immediately identify problems with future mitigation sites and recommend changes to that site and any others currently being permitted.

Because the Los Angeles District encompasses a much larger area including all of southern California and most of the state of Arizona, it is likely the policies that resulted in the loss riparian habitat in Orange County have also occurred throughout the entire District. Therefore, it is probable that there has been a much larger net loss of riparian habitat within the District. The loss of large areas of riparian habitat is crucial given the importance of this habitat in the arid landscape of the Pacific Southwest. Changes in the current policies must occur if these losses are to be avoided in the future. The use of HGM to quantify the habitat, and therefore the resultant losses, has provided the Corps with the data necessary to begin to address the current policies. The Corps is committed to the policy of no net loss of wetland habitat that includes evaluation of mitigation projects. The policy of accepting compensatory mitigation, after avoidance and minimization efforts have failed, will likely continue to be a part of the regulations for

many years to come. However, with proper documentation, the Corps can modify district policies and require more extensive mitigation planning to insure future compensatory mitigation projects are not just exercises in landscaping upland habitat but provide credible, valuable wetland habitat.

*Editor's note: Mark Sudol is Chief of the Regulatory Branch, Headquarters*

### ***Riparian Areas: Functions and Strategies for Management***

*Rudy Nyc*

A new National Academy Press book entitled *Riparian Areas: Functions for Strategies and Management* has been published. This book is an outgrowth of the 1995 NRC Report on Wetland Characteristics and Boundaries. During the course of that 1995 investigation the study team concluded that many riparian areas did not have sufficient wetness characteristics to meet the wetland definitions of the Corps and EPA, even though they were part of the same ecosystem. Furthermore, they found that in arid climates where wetlands are rare, these marginally wet and upland riparian areas performed virtually the same functions as wetlands in more humid climates. However, extending the wetland concept to include these dryer riparian areas was not viable during that investigation, so the NRC decided to conduct a separate study later. This book summarizes the study and its stated purpose is "...to recognize and identify the attributes of riparian areas and make recommendations for managing and maintaining these attributes".

The book discusses all aspects of riparian areas throughout the United States including the following regions: Boreal and Artic Alaska, Pacific Northwest and Coastal Mountains, Arid and Semiarid Southwest, Rocky Mountains, Great Plains, Cool Temperate East, and Southeast. It is based on a thorough survey of pertinent literature and contains hundreds of references. Examples from the references are used to illustrate technical points throughout the book. After the introductory chapter, Chapter 2 explains how the diverse riparian areas across this country were formed, how they function, their similarities and regional differences. Already by this point in the book it is very clear that riparian areas are a valuable resource and the reader should be able to articulate what makes them so significant. Chapter 3 describes their fate due to human alterations while Chapter 4 describes emerging legal strategies to protect these areas. All this background information culminates in chapter 5 in a pragmatic assessment about what can be done to restore and manage these valuable resources.

While this study was not prepared with the Corps in mind, it clearly can be valuable to the Regulatory Program because it looks at the form and function of the riparian areas from an aquatic perspective. Insight about the diverse interactions that occur between the aquatic and riparian areas is important to the Corps since it is now paying increasingly more attention to rivers and streams. Understanding the role of the upland component of riparian areas is also important to the Corps as it continues to look at the utility of buffers adjacent to wetlands. The discussions found in this reference can be useful in helping project managers decide how to incorporate riparian areas and buffers in project evaluation and mitigation decisions.

What are riparian areas? Everyone in the Corps, particularly those in Regulatory, have an answer to that question. Does the Corps regulate riparian areas? It depends how you define them. The authors of this report took a holistic approach with riparian areas and developed a working definition that is broad in the sense that it encompasses location, hydrology, vegetation, soils, and the concept of gradients. This definition is consistent with other definitions and incorporates the concepts several federal agencies have adopted in their own definitions.

#### **National Research Council's Working Definition of Riparian Areas**

Riparian areas are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. They include those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., a zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines.

#### **Composition**

While there is wide regional variation in plant species associations, it is interesting that there is the following core genera of tree species throughout the country that occur in riparian areas: alders, cottonwood and willows. A secondary genera that is widely distributed throughout the riparian areas consists of ash, birch, hackberry, hawthorn and maple. These primary and secondary plant genera are also associated with riparian areas in Asia and Europe.

**Functions**

One of the key factors about the riparian area continuum is that there is a gradient which, in its simplest form, means it goes from very wet and progressively gets dryer until it becomes upland habitat. The hydrodynamics of rivers, streams, lakes and estuarine-marine systems shape the riparian areas. The riparian areas in return contribute significantly to the physical, chemical and biological integrity of the adjacent aquatic ecosystem. It is a symbiotic relationship. The major functions of riparian areas are discussed in the report and are just briefly summarized below in order to provide an indication of how these functions support aquatic resources and their protection. This information can help in making decisions on whether to incorporate riparian areas in mitigation planning.

**Thermal Attenuation.**

Thermal attenuation, or regulation of water temperature in waterways, is a very important function performed by riparian areas. This is achieved through both shading by the tree canopy and ground water interchange between the aquatic ecosystem and riparian area. Water temperature in aquatic ecosystems adjacent to riparian areas is cooler in the summer and warmer in the winter. One study referenced in the books showed water temperatures of 25 degrees C in an exposed stream whereas further downstream, where it was fully canopied, the temperature did not exceed 10 degrees C. Even in the wintertime, with leaves off the trees, the water is warmer in the aquatic system adjacent to riparian area due to ground water effects. Riparian vegetation can also create its own microclimate, which makes it more suitable for supporting a diversity of plants and animals, including reptiles, amphibians, fish, invertebrates and mammals. Many federally listed species of plants and animals occur in riparian areas.

**Large Wood**

In addition to detrital matter, forested riparian areas contribute large wood (trees) to adjacent aquatic ecosystems. Large wood affects the waterways hydrology, which maintains the physical habitat diversity of streams and rivers. This can help create pool and riffle areas. Large wood also provides direct habitat in the aquatic ecosystem. Intentional introduction of large wood as a management tool has not been used much outside to the Pacific Northwest.

**Habitat**

A study from the Pacific Coast ecoregion demonstrated that 60% of amphibian species, 16% of reptiles, 34% of birds and 12% of mammals "...can be classified as riparian obligates." In the Southwest, 70% of threatened and endangered vertebrate species are dependent on riparian areas and primarily occur in these habitats.

Much of the concern about riparian areas has been related to their importance in helping to maintain healthy fish populations and water quality. Thermal attenuation of the adjacent water body is very important, because water temperature determines how much oxygen can be dissolved in water. What is good for the fish is also good for other aquatic life forms.

Riparian areas are extremely important to birds as breeding and foraging areas.

**Water Quality, Flood Attenuation, Sediment Retention**

Since non-wetland riparian areas in the more arid parts of the country perform similar functions to wetlands, and in the wetter part of the country riparian areas include wetlands, it is not surprising that in general riparian areas perform virtually the same functions as wetlands. This includes improvements to water quality through sediment retention, pollution removal and attenuating water temperatures, source of detritus and lessening impacts of floods.

To determine the quality and function of riparian areas rapid assessments are more practical than exhaustive studies of degraded ecosystems. There are two categories of rapid assessment techniques: functional assessment that estimate the extent to which former functions still exist and reference-based methods which evaluate the condition of the ecosystem. Methodologies developed for wetlands will work for riparian area but may require some modifications. Examples of functional assessment techniques include Wetland Evaluation Technique (WET) and Habitat Evaluation Procedures (HEP). Examples of reference-based assessments include Proper Functioning Condition (PFC) developed by BLM for western USA, Hydrogeomorphic Approach (HGM) most familiar to the Corps and Indices of Biological Integrity (IBI) case studies of which were presented in previous issues of ARN.

Demonstrating whether a non-wetland riparian area functions in very much the same way as a wetland can be important in all aspects of formulating an effective mitigation strategy.

There are also methods that were developed for organizing habitat information in a large-scale context such as watersheds, and these are very applicable for riparian areas. These are Hydrogeologic Equivalence and Synoptic Approach.

**Restoration / Mitigation**

This book is particularly useful for developing mitigation plans, including mitigation banks. While the book deals with restoration rather than mitigation, restoration is a form of mitigation. Very few riparian areas have been restored for their intrinsic ecological value. Most riparian area restoration has been performed for enhancing fish habitat or

improving water quality. Two types of restoration are presented: passive and active.

**Passive Restoration**

Passive restoration involves curtailing those activities, which are causing riparian area degradation or preventing its recovery. A good example of passive restoration is where cattle are grazing and trampling vegetation on a former riparian area. Removal of cattle or keeping them out with fencing will result in recovery of the riparian area. An example of passive restoration in the Regulatory Program is requiring fencing as a condition to a permit.

Another example, summarized from one of the references in the book, involved providing more natural flows below a dam to improve fish habitat. After the flows had been varied so that there were peak flows and low flows, similar to natural conditions, seedlings of riparian trees started germinating and growing on bars in the waterway and adjacent riparian areas. This was attributed, in part, to the fact that seeds of most tree species need relatively dry conditions to germinate. When there had been a constant flow of water it was too wet for the seeds to germinate. Then as the releases were increased, the trees were able to send their roots further into the substrate and flourish. Passive restoration may be a very cost effective means of restoring riparian areas as part of overall mitigation planning, including mitigation banking and in-lieu-fee programs.

**Active Restoration**

Active restoration is where something is actually done onsite to bring back some or all of the riparian area back to a self-sustaining natural condition. This is achieved by combining elements of natural recovery and management. Before restoring an area, it is important to have an understanding of its historic physical, chemical and biological makeup. Finding a relatively undisturbed riparian area similar to one being considered for restoration is a good way to determine what needs to be done. These reference sites make it possible and desirable to use methodologies such as HGM approach. These same methodologies can then be used to measure success of the restored area.

Restoration techniques at the aquatic side of the riparian area are essentially the same as with wetlands. There is not much information on restoration techniques for the upland component of a riparian area. Replacement of vegetation that which historically occurred there would be relatively straightforward and presumably hydrology would need to be replicated, as much as possible, to original conditions. However the source of the original demise of the area must be determined and controlled or the restoration will not be successful.

**Buffers**

There is considerable discussion in the book about upland buffers, also referred to as riparian buffers and buffer zones. As used in the book these are not natural riparian area systems. The wealth of information in the literature reflects their growing popularity around the country of using riparian buffers as a means of improving water quality in streams, particularly in agricultural areas. The Multi-Species Riparian Buffer System (MRBS) is a popular approach. It consists of several zones. The first zone has 4 or 5 rows of fast growing trees adjacent to the stream for bank stabilization, sediment removal, wildlife habitat and stream shading. The second zone generally consists of native shrubs to provide habitat diversity and to slow flood waters. The third zone consists of stiff, warm season grasses, such as switchgrass, to slow down flood water and help water infiltrate into the sediment. One advantage of this system is that maintenance is simple requiring only mowing or burning the grass at select times of the year and harvesting some trees every 8 to 12 years. This is an artificial system. USDA has a more natural three-zone system where the first zone consists of permanent native trees, while the second zone is a managed forest area. Zone 3 is a managed runoff control zone consisting of herbaceous plants. Both methods are designed for areas where restoration of natural riparian habitat is not a viable option. The book sites numerous studies, which have documented the success of riparian buffers in controlling nonpoint source pollution from agricultural and urban areas.

There are major federal and state riparian buffer efforts underway in the USA including the federal Conservation Buffer Initiative and the state and regional Chesapeake Bay Riparian Forest Buffer Initiative. Both of these are large-scale efforts.

**Conclusions and Recommendations from Riparian Areas Book**

There are conclusions and recommendations throughout the book, varying from general to specific topics. The General Conclusions and Recommendations are those arrived at by the NRC committee. Detailed Conclusions and Recommendations below were selected from various chapters and sections of the book based on potential interest to the Corps Regulatory Program.

- **Restoration of riparian functions along America's water bodies should be a national goal.** Because riparian areas perform a disproportionate number of biological and physical functions on a unit area basis, their restoration can have a major influence on achieving the goals of the Clean Water Act, Endangered Species Act and flood damage control programs.

- **Protection should be the goal for riparian areas in the best ecological condition, while restoration is needed for degraded riparian areas.** First priority should be given to protection of those areas in natural or near natural condition. Restoration of degraded riparian areas should be prioritized in terms of their relative values, cost effectiveness and likely hood of restoration to succeed.
- **Patience and persistence in riparian management is needed.** The degraded status of many riparian areas represents the cumulative, incremental effect over long periods of time. Substantial time will be required to improve or restore functions of degraded riparian areas. Commensurate with restoration, there must be efforts to improve society’s understanding of what riparian functions have been lost and what can be recovered.
- **Although many riparian areas can be restored and managed to provide many of their natural functions, they are not immune to the effects of poor management in adjacent uplands.** Riparian area management must be a component of good watershed management.

**Regulatory Perspective**

The preponderance of literature on riparian areas deals with the arid and semi-arid west. That is also a region of the country where a considerable portion of the riparian areas are too dry to be classified a wetland under the Corp’s and EPA’s wetland definition. Consequently this book tends to leave the impression, without actually stating it, that much of the riparian areas are not wetlands. Yet, according to the definition, wetlands adjacent to rivers, streams, lakes and marine-estuarine water bodies are part of the riparian area system. This influence from the arid regions can create some confusion when encountering statements such as riparian areas do not receive the same level of protection as wetlands. This does not make this book less useful. It’s just that the reader needs to keep this in mind.

The book contains a tremendous amount of information about virtually all that is in the technical literature about riparian areas nation-wide. Those involved in the Corps Regulatory Program are highly encouraged to obtain a copy of the book or view it on the internet at this address: <http://www.nap.edu/books/0309082951/html/>

***Also of Interest***

**Changes at HQ.** Since the last issue, HQ has welcomes Russell Kaiser from the Los Angeles District. Russ will be working primarily on SWANCC issues and will be the POC for the North Atlantic Division. Mike Rabbe is on developmental assignment from the Omaha District and will be at HQ throughout this calendar year. He is working on

various Mitigation Action Plan (MAP) issues and preparing several MAP draft documents

**National Wetlands Mitigation Action Plan (MAP): Current Status.**

The Federal interagency MAP identified 17 action items primarily in response to recommendations in the NRC report “Compensating for Wetland Losses Under the Clean Water Act” (2001).

1) The Corps should re-evaluate Regulatory Guidance Letter (RGL 02-02). *Status: Done. RGL 02-02, December 26, 2002.*

2) The development of guidance on the use of on-site vs. off-site and in-kind vs. out-of-kind compensatory mitigation. *Status: Draft is completed and was distributed at July 2003 Stakeholders forum in Portland, OR. Awaiting final comments from various agency Districts, Regions, field offices and stakeholders. Substantial changes may be made and draft provided to MAP review team. To be completed by the end of 2003.*

3) The development of guidance that clarifies implementation of the TEA-21 preference for mitigation banking. *Status: Final Joint Guidance issued July 11, 2003.*

4) Stream mitigation in the Section 404 program. *Status: EPA contracted private consultant (Nutter and Associates) to: a) compile bibliography of stream assessment methods; b) compile and compare Federal, state, and local stream assessment SOP’s; c) create a dichotomous key format for selection of appropriate stream assessment methods based on technical factors; d) Tabulate level of effort, complexity and necessary components to use (and calibrate) protocol to local conditions; e) tabulate degree to which each protocol can be utilized to evaluate proposed project’s impact, identify necessary compensatory mitigation and assess proposed mitigation plan/site; f) Tabulate date gaps and recommend future research and development needs. To be completed by December 1, 2003.*

5) Development of a model mitigation plan checklist for permit applicants. *Status: Draft Checklist was distributed at Stakeholders forum and comments to be incorporated into draft. Draft will be provided to MAP review team. To be completed by end of 2003.*

6) Develop guidance adapting the NRC-recommended guidance for creating or restoring self-sustaining wetlands to the Section 404 program (NAS criteria). *Status: Draft NAS guidance was distributed at Stakeholders forum and final comments due from participates in attendance. Draft will be provided to MAP review team for comments. To be completed by end of 2003.*

7) Determine the effectiveness of using biological indicators and functional assessments for evaluating mitigation performance. *Status: No involvement by Corps Division or District personnel at this time. To be completed by the end of 2003.*

8) Compile and disseminate information regarding existing mitigation-tracking database systems. *Status: Corps HQ is currently reviewing with OMB on procedures to follow in obtaining data. We may need to coordinate with different agencies (both State and Federal) for their input. Division and District staff will be involved to obtain various database systems currently available. To be completed by end of 2003.*

9) Develop guidance on the use of vegetated buffers as a potential component of compensatory mitigation. *Status: Basic research has been initiated by Corps HQ and will involve the Division Map team to assist in a survey, and report on current and projected use of buffers for compensatory mitigation and also on current regionalized aspects of using buffers in certain areas of the U.S. Drafts will be provided to MAP review team for comments. To be completed by the end of 2004.*

10) Develop guidance on the appropriate use of preservation for compensatory mitigation. *Status: Basic research has been initiated by Corps HQ and will involve the Division Map team to survey, and report on current policies on the use of preservation. Drafts will be provided to MAP review team for comments. To be completed by the end of 2004.*

11) Develop guidance for protecting those wetlands for which mitigation, restoration, or creation is not feasible or scientifically viable. *Status: Work has not been started on this action item. This report is to be completed by the end of 2004.*

12) Building on previous watershed guidance action items, EPA and the Corps, working with USDA, DOI, and NOAA, will co-lead an analysis with Tribes and States on the use of compensatory mitigation within a watershed context. *Status: A draft roadmap has been developed address this action item. To be completed by the end of 2005.*

13) Building on previous watershed guidance action items, identify criteria for making compensatory mitigation decisions within the watershed context. *Status: The amount of involvement from Divisions and Districts is unknown at this time. To be completed by the end of 2005.*

14) Building upon the biological indicators and functional assessments research, develop performance standards guidance on monitoring and adaptive management of mitigation sites by 2005. *Status: Corps HQ has prepared a draft of future performance standards and is currently reviewing with HQ staff and selected Division and District*

*Staff. Limited involvement from Divisions and Districts, as most work will be done at the HQ level. To be completed by the end of 2005.*

15) Clarify key concepts related to performance standards. *Status: No defined date to complete.*

16) Building upon the analysis of existing mitigation data base systems, establish a shared database by 2005. *Status: Corps HQ has developed a new database system (ORM) with assistance of select Districts. Deployment begins this October in one District and will occur District by District over the next one and one-half years, along with training, for all Regulatory staff. This will require some effort and time on everyone's part to learn and use a universal data base system, but the benefits will directly tie into our future staff and funding needs. This task will be completed by the end of calendar year 2005.*

17) Utilizing the shared database, provide an annual public report card on compensatory mitigation to complement reporting of other wetlands programs. *Status: Little involvement by Divisions or Districts, other than quarterly reports to HQ. This task is to be completed by end of 2005.*

18) EPA will continue to provide financial assistance through its wetlands State grants program to encourage Tribes, States, and others to increase the success of mitigation in their jurisdictions. *Status: No involvement by Divisions or Districts. This is more of an ongoing effort, however, EPA will be required to publicize the annual availability of grants for this purpose.*

The Corps MAP review team members are as follows: Molly Martindale (SPD), Christy Everett (POD), Ruth Ladd (NAD), Tim Carey (NWD), Mike Hasty (LRD), Alan Miller (SAD), Jennifer Walker (SWD), and Steve Eggers (MVD). If anyone else would like to be involved in any of the reviews, please contact your division representative. (submitted by Kathy Trott, HQ)

**Third Stakeholder Forum on Mitigation** (excerpts from Environmental Law Institute website).

On July 29-31, 2003 the Third Stakeholder Forum on Federal Mitigation was held in Portland, Oregon. The City of Eugene, Federal Highway Administration, National Oceanic and Atmospheric Administration, Natural Resources Conservation Service, Oregon Department of Transportation, Oregon Division of State Lands, Port of Portland, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and Washington Department of Ecology sponsored the forum. The event brought together a diverse group of individuals from federal and state government, non-profit environmental organizations, third party mitigation providers, and others from the private sector, including those from academia, home builders, representatives of ranchers and the farm community, and non-governmental

organizations. The 2 ½-day meeting was designed to achieve the following objectives:

- Review progress on the actions set forth in the 2002 National Wetlands Mitigation Action Plan;
- Solicit feedback on Mitigation Action Plan tasks to be completed in 2003; and
- Solicit input on future Mitigation Action Plan actions and goals for 2004-2005.

The meeting was designed to provide a forum for representatives from a broad range of stakeholder interests to comment on and discuss these documents in order to inform efforts to improve federal wetland mitigation. The forum was not meant to poll stakeholders or to yield consensus-based directives for the agencies. However, several recurrent themes emerged that warrant mention.

Many of the issues discussed during the forum relate to reforming wetland mitigation to encourage a watershed-based approach. Participants generally supported the use of preservation in wetland mitigation in strictly defined circumstances in which it would be in accord with a watershed approach and would not undermine the national no net loss goal. Situations in which participants supported the use of preservation included: when preservation is part of a mitigation project that achieves at least a 1:1 replacement ratio through other mitigation methods; when preservation is used to protect particularly rare, valuable, or difficult to replicate wetland types; and preservation that would augment the functions of other mitigation actions. Many participants stressed the need for greater flexibility in allowing for mitigation functions to be split between multiple mitigation projects as an essential component of moving towards a watershed approach, particularly in mitigating impacts to wetlands in urban and suburban areas.

Stakeholders encouraged the federal agencies to improve monitoring, maintenance, and long-term protection of mitigation sites. Many participants encouraged the agencies to use ecological data collected from monitoring of successful sites to help develop mitigation ratio requirements for specific types of mitigation.

Various stakeholders called for greater public participation, transparency, and consistency in the Corps regulatory process. Many emphasized the importance of establishing consistently high standards for mitigation projects while allowing flexibility so that mitigation may be designed to suit the particular conditions of a region and the specific situation of each project. Stakeholders repeatedly discussed the need to balance detailed upfront planning with flexibility and adaptive management in order to ensure successful mitigation while encouraging innovation.

Participants emphasized the importance of keeping the larger context of federal wetlands mitigation in mind during discussions of individual components and issues. While all

of the components of the MAP are focused on compensatory mitigation, stakeholders stressed the importance of adhering to the sequencing provisions whereby impacts are first avoided and minimized before compensatory mitigation is considered as the last option. Participants pointed out that the §404 program is meant to protect aquatic resources generally, not just wetlands. They also suggested that the new guidance documents should be coordinated or combined in a manner that allows for a national mitigation policy that is coherent, consistent, and manageable for the field staff that must implement it.

An audio recording of the forum, Day 1 field trip photos, PowerPoint presentations, and links to many of the policy and technical documents discussed in this report are available at the Environmental Law Institute’s website at <http://www.eli.org/research/wetlandsmitigationforum2003.htm>

Corps attendees included: Mark Sudol (HQ), Mike Rabbe (HQ on detail from Omaha District), Bob Brumbaugh (IWR), Gail Terzi (Seattle District), David Martin (Seattle District), Kathryn Harris (Portland District), and LTC Charles Markham (Portland District).

**Stream Corridor Inventory and Assessment Techniques**

The Wetland Science Institute has issued a Technical Report entitled "*Stream Corridor Inventory and Assessment Techniques*". The stream corridor inventories and assessment listed in this guide represent a partial catalog of tools currently available (pre-2001) for determining conditions of a stream and its associated corridor. These tools are also useful at the site scale to establish base line conditions and evaluate cause-and-effect. This report can be accessed at their website:

<http://www.wsi.nrcs.usda.gov/products/stream.html>  
(submitted by Kathy Trott, HQ)

**And Finally, Another Court Case on Wetland Jurisdiction**

The Fourth U.S. Circuit Court of Appeals issued an opinion regarded as a wide-ranging victory for Federal and State efforts to protect wetlands jurisdiction. At issue in the case, *Treacy v. Newdunn Associates*, was a 43-acre property in Newport News, Virginia. Approximately 38 acres of this property, owned by Newdunn Associates, is forested non-tidal wetlands. Before construction of I-64 in the 1960s, the wetlands on the property had a natural connection to Stony Run, a navigable waterway. Since construction of I-64, wetlands on the property remained connected to the navigable waters of Stony Run by the intermittent flow of surface water through manmade and natural streams and ditches. Following the Supreme Court’s ruling in *Solid Waste Agency of Northern Cook County (SWANCC)* case, Newdunn informed the Corps of Engineers that there were no jurisdictional wetlands on its property that required a

**Newsletter Communication**

permit under the Clean Water Act. Both the Corps and the Commonwealth of Virginia disagreed, and brought enforcement actions against Newdunn. The Federal and State issues were consolidated in the U.S. District Court for Eastern Virginia, which held a five-day bench trial in March 2002. Following a loss in that court, the Federal and State governments appealed to the Fourth Circuit. Citing an earlier Fourth Circuit case, *Deaton*, the appeals panel upheld Corps jurisdiction over wetlands adjacent to non-navigable tributaries (including man-made ditches) of navigable waters. The panel allowed the Corps to assert jurisdiction over every tributary system that eventually flows into a navigable body of water, even manmade roadside ditches. In addition, the court upheld Virginia's right to a state-regulated wetland permit system, even if some of the information used in its process comes from the Corps Sec. 404 Clean Water Act program. Favorable decisions have now been rendered in the Ninth Circuit: (*Headwaters, Inc. v. Talent Irrigation District*), the Sixth Circuit (*U.S. v. Rapanos*), and the Fourth Circuit: (*Treacy v. Newdunn* and *U.S v. Deaton*). (This review is from the Field Weekly Significant Activities from Corps HQ).

To comment on the newsletter, suggest topics, submit an article, or suggest events or articles of interest, please contact Bob Brumbaugh at:

Institute for Water Resources, CEIWR-PD  
7701 Telegraph Rd.  
Alexandria, VA 22315-3868

**CONTRIBUTORS**

Presley Hatcher.....CESWF-PER-RP  
Joe Hickman.....EPA Region VI  
Rudy Nyc..... IWR consultant  
Norm Sears..... EPA Region VI  
Mark Sudol.....CECW-OR  
Jennifer Walker.....CESWF-PER-RP

**ACKNOWLEDGEMENTS**

Mike Rabbe....CENWO (detail to HQ)  
Meg Smith.....CEIWR-PD  
Katherine Trott.....CECW-OR