EPA/600/D
87-308

Kentula, M.E. 1987. Does mitigation work?: EPA's Wetlands Research Program is checking, p. 2-6. IN: Proceedings of the Fourteenth Annual Conference on Wetlands Restoration and Creation. F.J. Webb (ed.). Hillsborough Community College, Tampa, Florida.

PROCEEDINGS OF THE FOURTEENTH ANNUAL CONFERENCE ON WETLANDS RESTORATION AND CREATION

May 14-15, 1987

Sponsored by
Hillsborough Community College
Institute of Florida Studies

Frederick J. Webb, Jr.
Editor

Hillsborough Community College
1206 North Park Road
Plant City, Florida 33566

KEYNOTE ADDRESS

DOES MITIGATION WORK?: EPA'S WETLANDS RESEARCH PROGRAM IS CHECKING

By:

Mary E. Kentula
Project Scientist
Wetlands Research Program
Northrop Services, Inc.
200 S.W. 35th Street
Corvallis, Oregon 97333

EPA'S WETLANDS RESEARCH PROGRAM

The U.S. Environmental Protection Agency (EPA) adopted in January of 1986 a Wetlands Research Plan (Zedler & Kentula 1986). The Plan outlined research to (1) define the water quality functions of wetlands; (2) develop a method to assess and predict the cumulative impacts associated with the incremental loss of wetlands; and (3) provide support for Agency personnel faced with decisions concerning mitigation for permitted wetland losses through creation or restoration.

The research program was funded in April 1986. The Environmental Research Laboratory in Athens, Georgia was given responsibility for the water quality research. Responsibility for the cumulative impact and mitigation research was given to the Environmental Research Laboratory in Corvallis, Oregon. The Mitigation Research Component is the subject of this paper.

THE MITIGATION RESEARCH COMPONENT

The creation or restoration of wetlands is often required as compensation for wetland losses permitted under Section 404 of the Clean Water Act. Created and restored wetlands represent a range of conditions and situations. Many are small in size, often less than an acre. However, some, as in the restoration of areas impacted by mining, are hundreds of acres. Many occur in urban areas and reflect the influence of high population densities. Others, mostly the result of highway construction, occur in rural settings. Sometimes attempts are made to create wetlands that look as natural as possible. Others look obviously man-made. Despite the size, setting or appearance, the question remains: How well do these created and restored wetlands replace the ecological functions of the wetlands that were destroyed?

This question is central to the Mitigation Research Component. Although there are other forms of mitigation that could be considered in the program, the effectiveness of mitigation through the creation and restoration of wetlands is of great concern. The number of these projects is constantly increasing, while the science of wetland creation and restoration is considered to be in its infancy.

OVERVIEW

The Mitigation Research Component has two goals. They are to determine the ecological functions of created and restored wetlands, and improve project design. Ultimately, the results of the research will be compiled into a mitigation handbook for Agency 404 personnel. It will be designed to provide guidelines by which to (1) evaluate the probability that a proposed project will succeed, (2) formulate permit conditions, i.e. set goals, and (3) determine if a project met those goals. To gather the needed information, research has been initiated

to synthesize existing information and evaluate completed projects.

Research Project #1 - Synthesis of Information

Efforts are underway to synthesize two types of information on wetland creation and restoration. One focuses on the information contained in the literature; the other on that in the 404 permit record.

The literature synthesis will serve as provisional guidance until the first version of the handbook is produced. Since much of the information on wetland creation and restoration is not contained in the scientific literature, the goal is to assemble information from as many sources as possible, including personal experience.

A group of eminent wetland scientists has been commissioned to produce the document. They are primarily people who have worked on various aspects of wetland creation and restoration. Dr. Jon Kusler of the Association of State Wetland Managers and I coordinate the effort.

The document will be composed of two sections. The first will be a series of theme papers covering the wide range of topics of general application to wetland creation and restoration. These topics include succession and stability of created and restored wetlands, an overview of wetland evaluation, and applications for creating wetlands for waterfowl management. The second will be a series of regional reviews. These will discuss the status of the science of wetland creation and restoration for wetlands of various types in different regions of the country. The authors will also identify information gaps and research needs. These will be reviewed by members of the National Wetland Technical Council which will then recommend research priorities for the program.

A compilation of information from the 404 permit record will be used to characterize patterns and trends in permit-related wetland creation and restoration and identify completed projects for evaluation. To facilitate the process, a data management system was designed. The system runs on an IBM-compatible personal computer equipped with DataBase III or III+. Essentially, the commercial program was customized to streamline data entry and, thus, eliminate errors.

During the past year, the system was tested by contractors assembling databases of projects in EPA Region X (Oregon, Washington and Idaho) and California, and freshwater projects in Texas, Arkansas, Louisiana, Alabama and Mississippi. It is now being revised. The software and user's manual will be available by the end of the calendar year.

Preliminary analysis of the databases from Washington and Oregon indicates that over 90% of the projects occur West of the Cascade Mountains and in the vicinity of urban centers. Estuarine intertidal

(salt marshes and mudflats) and palustrine (emergent marshes and ponds) are the wetland types most often created or restored. In addition, these databases have been used to select complete projects for evaluation.

Research Project #2 - Evaluation of Completed Projects

Completed wetland creation and restoration projects are being treated as "experiments in progress." The goals are to compare characteristics of created and restored wetlands with those of naturally occurring wetlands and determine how those characteristics change with time. An approach to conducting the evaluations is currently being tested in pilot studies in Washington, Oregon and Florida.

The first step is to identify the "test" population by searching the permit database for groups of completed projects that might form a sampling unit. For example, in Oregon the test population identified is a group of twelve, created, emergent marshes less than a hectare in size, ranging in age from six months to six years, in an urban area of the Willamette Valley.

Next, a set of reference sites are selected. A stratified random sample is made of naturally occurring wetlands with characteristics defined by the test population. Again, in Oregon this was a group of emergent marshes less than a hectare in size occurring in the urban areas of the Willamette Valley.

Finally, the sites are evaluated. Plant community structure, substrate, water quality and hydrologic variables are sampled. Where possible, various methods of sampling the same variable are used. The data obtained will be used to test the usefulness of various methods and the consistency of the results obtained when they are used by different individuals.

RESULTS FROM THE FIRST YEAR OF THE PROGRAM

The following will report the results of the research described above:

Literature Synthesis	Early 1988
Permit Database Software and User's Manual	Fall 1987
Patterns and Trends in the 404 Permit Record--Washington, Oregon, California	Fall 1988
Patterns and Trends in the 404 Permit Record--Freshwater Projects in Texas, Arkansas, Louisiana, Alabama, Mississippi	Early 1989

Procedure for Selection of Reference Sites	Summer 1987
Results of Pilot Study to Test Method to Evaluate Mitigation Sites--Washington and Oregon	Summer 1988
Results of Pilot Study to Test Method to Evaluate Mitigation Sites--Florida	Fall 1986

CONCLUSIONS

EPA's Research Plan set program research goals in relation to the plans and efforts of other groups. Since there are many unanswered questions and limited resources with which to seek the answers, it is important that duplication is avoided. Therefore, the Wetland Research Program has an information transfer component to disseminate its findings and collect those of other researchers. A mailing list is maintained and a flier that briefly describes the Program's progress is distributed. Those interested in being included on the mailing list or in supplying information on their research should contact the Wetland Research Program at the Environmental Research Laboratory, 200 S.W. 35th Street, Corvallis, OR 97333; phone: (503) 757-4666, FTS 4204666.

The first year of EPA's Wetland Research Program has been busy. The products described above are in various stages of completion. However, even with all this activity the answer to the question, "Is mitigation working?," is only beginning to be answered. Hopefully, with the efforts of the Wetlands Research Program and that of other scientists working in the field, the next time a report on the Program's progress is given there will be more of an answer.

LITERATURE CITED

Zedler, J. B. and M. E. Kentula. 1986. Wetlands research plan. EPA/600/3-86-009. U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, Oregon. National Technical Information Service Accession Number PB86 158 656/AS.