

**DEPARTMENT OF DEFENSE**

Department of the Army, Corps of Engineers

**DEPARTMENT OF TRANSPORTATION**

Federal Highway Administration

**DEPARTMENT OF AGRICULTURE**

Natural Resources Conservation Service

**ENVIRONMENTAL PROTECTION AGENCY****DEPARTMENT OF THE INTERIOR**

Fish and Wildlife Service

**The National Action Plan To Implement the Hydrogeomorphic Approach To Assessing Wetland Functions**

**AGENCIES:** Corps of Engineers, Department of the Army, DOD; Natural Resources Conservation Service, Department of Agriculture; Federal Highway Administration, Department of Transportation; Environmental Protection Agency; and Fish and Wildlife Service, Department of the Interior.

**ACTION:** Notice.

**SUMMARY:** Through the National Action Plan the Corps of Engineers is announcing the strategy the Corps and other Federal agencies will follow to implement the Hydrogeomorphic Approach for Assessing Wetland Functions (HGM Approach) through the development of regional guidebooks. The National Action Plan was developed by a National Interagency Implementation Team. Agencies listed herein. The HGM Approach was designed to satisfy the need for better information on wetland functions within the programmatic requirements of the Clean Water Act Section 404 regulatory program. This methodology will increase the accuracy of wetland function assessments, allow for replicability, and reduce the amount of time required to conduct a wetland function assessment.

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Garrett, Federal Highways Administration, at (202) 366-2067; Mr. Donald MacLean, Fish and Wildlife Service, at (703)358-2201; and Ms. Susan-Marie Stedman, National Marine Fisheries Service at (301)713-2325 or access the U.S. Army Corps of Engineers Regulatory Home Page at: <http://wetland.usace.mil/> or the U.S. Army Engineer Waterways Experiment Station Home Page at: <http://www.wes.army.mil/el/wetlands/wetlands/html/>.

**SUPPLEMENTARY INFORMATION:** The HGM Approach is a wetland assessment procedure that is based on three fundamental factors that influence how wetlands function: position in the landscape (geomorphic setting), water source (hydrology), and the flow and fluctuation of the water once in the wetland (hydrodynamics). The HGM Approach first classifies wetlands based on their differences in functioning, second it defines functions that each class of wetland performs, and third it uses reference to establish the range of functioning of the wetland. Regional assessment models are developed based on the functional profile that describes the physical, biological, and chemical characteristics of a regional wetland subclass. The goal of the National Action Plan is to implement, through the development of regional guidebooks, sufficient assessment models to address 80 percent of the section 404 permit workload requiring wetland function assessments. To achieve this goal, approximately 25-30 regional guidebooks will be required to be developed. Given the magnitude of the effort, and the need for interdisciplinary expertise, implementation of the HGM Approach will require participation from several Federal, State, Tribal and local agencies, academia, and the private sector. This involvement will occur at all stages of regional guidebook development.

**Discussion of Public Comments and Changes**

On August 16, 1996 the draft National Action Plan to Develop the Hydrogeomorphic Approach for Assessing Wetland Functions (Action Plan) was published in the **Federal Register** to which we received approximately 20 comments. In response to these comments, we have made a few revisions to the Action Plan as discussed below. The comments of greatest concern addressed issues regarding public involvement, communication/public outreach, training, potential uses, applicability,

and accuracy of models in predicting functions.

Overall, commenters were very supportive of the development of the Hydrogeomorphic Approach for Assessing Wetland Functions (HGM Approach). However, some commenters were concerned that the National Action Plan is policy, not guidance, and that the HGM Approach will preclude and undermine the section 404(b)(1) review. These concerns come from lack of understanding of the HGM Approach. The HGM Approach is a tool for assessing wetland functions and does not replace the need for delineating a wetland boundary nor supersede the Section 404(b)(1) Guidelines analysis or public interest review. Based on these comments this has been explained more clearly in the Action Plan.

The majority of comments indicated the need for more public involvement. A few commenters indicated concern with consultant involvement in developing regional guidebooks, suggesting that their involvement may influence how the models are developed. We have emphasized throughout the Action Plan that regional guidebook development is an iterative process that involves not only Federal, State, Tribal and local agencies but also academia, the private sector and the public. Regional guidebooks, developed by A-teams and having undergone peer reviews, will be published as operational drafts for a two year period. During this time the operational draft models will be subjected to further testing by the Federal agencies and the public with review comments solicited from the public. These review comments will be incorporated into the final models of the regional guidebooks. The final regional guidebooks will undergo review and revision every five years or less if needed. Again, this is explained in further detail in the Action Plan. We believe that the level of review prior to final publication is more than adequate to dissway any possible influence by consultant involvement. Also the models in the regional guidebooks are based upon scientific data and this data will be available for review and in the guidebooks themselves.

Several commenters were concerned with HGM policy. As indicated in the Action Plan, the Federal agencies will develop a policy statement and publish it in the **Federal Register** for comment. The National Action Plan or HGM Approach in itself is not policy. The Action Plan is a document that states the strategies the Federal agencies will follow in developing regional HGM Approach guidebooks. The HGM

Approach is a tool to be used in making regulatory decisions, at a Federal, state, or local level. It can also be used in the decision making process for applications such as mitigation banking and watershed planning. We believe that this has been fully addressed in the Action Plan.

Other commenters stated that the HGM Approach does not assess wetland values. The HGM Approach is based on the best available science and thus does not assign value to a wetland. Value represents the significance of wetland functions to society or individuals, and often reflects local priorities or policy issues beyond the scope of the HGM Approach. The functional capacity indices resulting from the HGM Approach cannot be equated to the societal or economic value of that wetland function. However, this information can be used when assigning values to wetland functions in terms of economic or other value units as required by the Corps public interest review process.

A few commenters indicated the need for more Federal funding to help model development. At present there are approximately 15 separate efforts ongoing (see Table 3 of the Action Plan) that were initiated through Federal funding and approximately 15 efforts initiated by various States, mainly through the U.S. EPA State/Tribal Wetland Grant Program. There is a need for more funding. The Corps and other Federal agencies will continue to look for additional funding opportunities. Our efforts will continue to focus on reaching the goal of developing regional guidebooks to address 80 percent of the Corps permit workload for wetlands requiring wetland function assessment.

A few commenters thought the Federal government was moving too quickly in developing regional guidebooks and were concerned with the quality of those being developed. They would rather see an accurate, reliable guidebook rather than one that gave questionable results. We agree with this and have assessed the progress of regional guidebook development. As previously stated there are approximately 15 Federal national/regional guidebook development efforts. We have reassessed our goal of having approximately 20–25 regional guidebooks developed by the end of 1998. To ensure a reliable, accurate, scientifically based product we have decided that regional guidebook development to reach the 80 percent goal will take longer than two years. We have found through early guidebook development efforts that initial development takes longer than

anticipated. We have learned a great deal in the pilot phases of guidebook development. The regional guidebook development process is now more efficient, taking less time than the initial efforts while still maintaining scientific reliability. Regional guidebook development is time and resource intensive, generally taking approximately 1–2 years to develop. However, the actual application of these regional guidebooks to a specific project is rapid and will take approximately 1 day or less to assess a wetland. The Action Plan explains in greater detail the regional guidebook development process. Our goal remains the same—to have approximately 20–25 regional guidebooks developed which would address 80 percent of the Corps permit workload for wetlands requiring wetland function assessment. However, we acknowledge that it will take longer than our initial anticipated two year timeframe. As regional guidebooks become available, development of additional regional guidebooks will be expedited more efficiently.

A few commenters addressed the need for training. Two HGM courses, as described in the Action Plan, are under development by WES. In response to one commenters concern regarding the Federal agencies as the sole provider of HGM training there is no intent on the part of the Federal agencies to be the sole training source for the HGM Approach. However, it is the intent of the Corps to hold public meetings as regional guidebooks become available within a geographic area, where the guidebook and it's application will be explained.

Several commenters questioned whether the models can accurately predict functions. This is being addressed in the guidance being developed by Waterway Experiment Station (*Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks*) stating the protocol for regional guidebook development and is further explained in Section III A of the Action Plan.

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## **National Action Plan To Implement the Hydrogeomorphic Approach for Assessing Wetland Functions**

### **I. Executive Summary**

This National Action Plan (Action Plan) identifies the strategy the U.S. Army Corps of Engineers, U.S. Department of Agriculture—Natural Resources Conservation Service, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Federal Highway Administration, and National Oceanic and Atmospheric Administration—National Marine Fisheries Service will follow to implement the Hydrogeomorphic Approach for Assessing Wetland Functions (HGM Approach) through the development of regional guidebooks. This is a plan to guide Federal agency activities and inform the public on how the federal agencies will be developing regional guidebooks for use with the HGM Approach. The HGM Approach is a procedure for measuring the capacity of a wetland to perform functions. It was designed to satisfy the need for better

information on wetland functions within the programmatic requirements of the Clean Water Act Section 404 regulatory program. Information obtained using the HGM Approach can assist project proponents and regulators in assessing the level of environmental impact of a proposed project, in determining the appropriate level of regulatory review, and in assessing compensatory mitigation required for offsetting environmental impacts. The hierarchical and modular nature of the approach makes it adaptable to a variety of other regulatory, planning, management, and educational situations where information on wetland functions is needed.

The HGM Approach is characterized and differentiated from other wetland assessment procedures in that it first classifies wetlands based on their hydrogeomorphic characteristics (i.e., landscape setting, water source, hydrodynamics), second it uses reference to establish the range of functioning of the wetland, and third it uses a relative index of function, calibrated to *reference wetlands*, to assess wetland functions. This increases the resolution, allows for replicability, and reduces the amount of time needed to conduct the assessment. The HGM Approach utilizes reference wetlands as the means for establishing the scale, or index, against which other wetlands of the same type in a particular geographic area (*reference domain*) can be compared to determine their functional capacity. Reference wetlands are selected to reflect the range of conditions in a particular geographic area that a particular wetland type may exhibit, from relatively undisturbed to highly degraded.

Under the HGM Approach, national guidebooks are being developed for each of the major classes of wetlands: riverine, depressional, slope, flats (mineral soil and organic soil), and fringe (estuarine and lacustrine). The national guidebooks provide a template for developing regional guidebooks for *regional wetland subclasses*. Regional guidebooks include a definition and characterization of the regional wetland subclass, models for assessing selected functions, and methods for applying the *assessment models*. Interdisciplinary teams of wetland specialists from Federal, State, Tribal, and local agencies, as well as the private sector and academia, will coordinate the development of regional guidebooks. To ensure the technical accuracy of the effort, regional guidebooks will be developed following specific protocols and subjected to a rigorous peer review process involving wetland experts from

Federal, State, Tribal, and local agencies, academia, and the private sector. Regional guidebooks will be published initially as an operational draft for a two year period to provide agencies, academia, the private sector, and the general public an opportunity to review, apply, and comment on the procedure. Issues raised during this time will be addressed in the final publication. To ensure the best available science is incorporated, the final regional guidebooks will be subject to review and revision for a period not to exceed five years.

Regional guidebooks are being developed in three phases: a pilot phase, an expanded nationwide effort to develop 15 to 20 additional regional guidebooks, and an effort to develop additional models based on priorities established by the Federal agencies. Efforts will be prioritized so that at the end of Phase II there are a sufficient number of regional guidebooks to address 80 percent of the permit workload for wetlands requiring a functional assessment. Given limited agency resources, such an undertaking will require the coordinated participation of Federal, State, Tribal, and local agencies, as well as individuals from academia, and the private sector. State agencies and others who choose to initiate development of regional guidebooks on their own will be encouraged to coordinate with the Federal agencies to ensure consistency, quality, and maximum applicability by Federal, State, Tribal, and local agencies in their wetland programs.

Technical support and coordination for the development of the HGM Approach is being provided by the U.S. Army Engineer Waterways Experiment Station (WES). To facilitate development of the regional guidebooks, WES, in conjunction with other Federal and State agencies and other wetland experts, has developed, and will continue to develop, the necessary support documents, technical information and training materials. Experts from WES will oversee the development of regional guidebooks to ensure consistency and accuracy in these efforts.

To support implementation of the HGM Approach, the Federal agencies will be preparing a policy statement to clarify the application of the HGM Approach within the Section 404 regulatory program and the Food Security Act Swampbuster program. The HGM Approach is a procedure for determining the level at which a proposed project will affect wetland functions. An assessment using the HGM Approach is not a substitute for

the Section 404(b)(1) Guidelines or the public interest review; rather the HGM Approach is a tool to be used in the permit review process. It may be used to rapidly and consistently determine the level of environmental impact of a proposed project, to compare project alternatives, to identify measures that would minimize environmental impacts, to determine mitigation requirements, and to establish standards for measuring mitigation success. The policy statement will indicate the manner in which such applications can provide greater certainty and consistency within the decision making process.

## II. Overview of the Hydrogeomorphic Approach

The Hydrogeomorphic Approach for Assessing Wetland Functions (HGM Approach), developed by scientists at the U.S. Army Engineer Waterways Experiment Station (WES), is a procedure for measuring the capacity of a wetland to perform functions. The procedure was designed to satisfy the need for better information on wetland functions within the programmatic requirements of the Clean Water Act Section 404 (Section 404) regulatory program. The HGM Approach is a tool that can be used in the alternatives analysis and in assessment of compensatory mitigation within the Section 404 permit review process. The hierarchical and modular nature of the approach make it adaptable to a variety of other regulatory, planning, management, and educational situations requiring the assessment of wetland functions.

The HGM Approach is characterized and differentiated from other wetland assessment procedures in that it first classifies wetlands based on their ecological characteristics (i.e., landscape setting, water source, hydrodynamics), second it uses reference to establish the range of functioning of the wetland, and third it uses a relative index of function, calibrated to *reference wetlands*, to assess wetland functions. HGM uses a hierarchical classification with seven major hydrogeomorphic wetland classes. These classes are: riverine, depressional, slope, flats (organic soil and mineral soil), and fringe (estuarine and lacustrine). The hydrogeomorphic classification is based on three fundamental factors that influence how wetlands function: position of the wetland in the landscape (geomorphic setting), water source (hydrology), and the flow and fluctuation of the water once in the wetland (hydrodynamics). Within a specific geographic area wetland classes can be further divided

into regional wetland subclasses (e.g., vernal pools in California, prairie potholes in the northern plains states, and pine flatwoods in the southeastern U.S.). Classifying wetlands based on how they function narrows the focus of attention to a specific type or subclass of wetland, the functions that wetlands within the subclass are most likely to perform, and the landscape and ecosystem factors that are most likely to influence how wetlands in the subclass function. (Table 1.) This increases the accuracy of the assessment, allows for

replicability, and reduces the time needed to conduct the assessment. The HGM Approach includes a development phase and an application phase. The development phase is carried out by an interdisciplinary Assessment Team of wetland experts (A-team) and begins with the classification of wetlands into regional subclasses. The A-team then develops a functional profile that describes the physical, chemical, and biological characteristics (wetland functions) of the regional wetland subclass, identifies which functions are most likely to be

performed, and discusses different ecosystem and landscape attributes and processes that influence each function. The functional profile is based on the experience and expertise of the A-team and information collected from reference wetlands. Reference wetlands are selected from a reference domain (a defined geographic area) and represent sites that exhibit a range of variation within a particular wetland type including sites that have been degraded/disturbed as well as those sites which have had little disturbance.

TABLE 1.—HYDROGEOMORPHIC CLASSES OF WETLANDS SHOWING ASSOCIATED DOMINANT WATER SOURCES, HYDRODYNAMICS, AND EXAMPLES OF SUBCLASSES

Hydrogeomorphic class	Dominant water source	Dominant hydrodynamics	Examples of subclass	
			Eastern USA	Western USA
Riverine .....	Overbank flow from channel.	Unidirectional, horizontal.	Bottomland hardwood forests.	Riparian forested.
Depressional .....	Return flow from groundwater and interflow.	Vertical .....	Prairie potholes marshes.	California vernal pools.
Slope .....	Return flow from groundwater.	Unidirectional, horizontal.	Fens .....	Montane seeps Avalanche chutes.
Flats (mineral soil) .....	Precipitation .....	Vertical .....	Wet pine flatwoods .....	Playas.
Flats (organic soil) .....	Precipitation .....	Vertical .....	Peat bogs, portions of Everglades.	Peat bogs
Fringe (Estuarine) .....	Overbank flow from estuary.	Bidirectional, horizontal	Chesapeake Bay marshes.	San Francisco Bay marshes.
Fringe (Lacustrine) .....	Overbank flow from lake.	Bidirectional, horizontal	Great Lakes marshes ..	Flathead Lake marshes.

Source: Smith et al., An approach for assessing wetland functions using hydrogeomorphic classification, reference wetlands, and functional indices. U.S. Army Corps of Engineers Waterways Experiment Station, Technical Report TR WRP-DE-9. Vicksburg, MS. Oct. 1995.

The A-team next develops assessment models and calibrates them based on data collected from the reference wetlands. These models define the relationship between attributes and processes of the wetland ecosystem and surrounding landscape and the capacity of a wetland to perform a function. The assessment model results in a functional capacity index (FCI) (0-1.0), which estimates the capacity of a wetland to perform a function relative to other wetlands from the same regional subclass in the reference domain. The standard of comparison used to scale functional indices are reference standards, or the conditions under which the highest, sustainable level of function is achieved across the suite of functions performed by reference standard wetlands in a regional wetland subclass.

During the application phase of the HGM Approach, the assessment models in the regional guidebook are used to assess wetland functions. The context of the application may be the Section 404 permit review process, or in some other regulatory, planning, or management

situation. The HGM Approach does not replace the need for delineating a wetland boundary, preclude the sequencing process, nor supercede the Section 404(b)(1) Guidelines analysis or public interest review. The HGM Approach is a tool that can be used in the alternatives analysis and is expected to be used on those permit actions which warrant a functional assessment for determining wetland impacts. Regulators will be able to use this procedure to rapidly and accurately determine the level of environmental impacts of proposed projects, compare project alternatives, identify measures that would minimize environmental impacts, determine mitigation requirements, and establish criteria for measuring mitigation success. As such, the procedure will be helpful in providing greater certainty and reduced permit review times thus allowing for expedited decision making.

The HGM Approach does not assign a value to wetland functions. Value represents the significance of wetland functions to society or individuals, and often reflects local priorities or policy

issues beyond the scope of the HGM Approach. The functional capacity indices resulting from the HGM Approach cannot be equated to the societal or economic value of that wetland function. This information may be used when assigning values to wetland functions in terms of economic or other value units as required by the public interest review process.

**III. Implementation Strategies of the HGM Approach**

*A. Goals and Objectives for Implementation*

The primary goal for implementation of the HGM Approach is to provide a standardized tool for consistently assessing wetland functions in a diversity of wetland types throughout the United States. This tool will use the best available technical and scientific information and maintain compatibility with the time and resource framework of the Section 404 regulatory program. The objective is to develop a sufficient number of regional guidebooks to address 80 percent of the permit workload impacting priority wetlands

requiring a functional assessment, as identified by a Corps survey. This includes those individual and general permits requiring either an alternatives analysis and/or compensatory mitigation.

To achieve this goal, the Corps and other Federal agencies have formed a National Interagency Implementation Team (Implementation Team). The purpose of the Implementation Team is to prepare and oversee an implementation plan which identifies the priorities of HGM regional guidebook development and outlines the steps to develop a regional guidebook from model development to the application. This implementation plan prepared by the Implementation Team is the "National Action Plan to Implement the HGM Approach for Assessing Wetland Functions" (Action Plan). The Action Plan identifies the strategy the Federal agencies will follow in implementing this new assessment methodology to meet the identified objective.

All regional guidebooks will:

- (1) Be developed in a consistent and coordinated manner, following protocol identified in the "Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks". Technical oversight by scientists at WES will facilitate state and Federal interagency agreement on applications of the HGM approach, and will require the involvement of experts from academia and the private sector, as well as Federal, State, Tribal and local agencies at all stages and levels of review;
- (2) Utilize the best scientific information in the development of each model;
- (3) Develop regional guidebooks based on national and regional priorities for the Section 404 Regulatory program;
- (4) Make the most efficient use of limited agency resources; and
- (5) Ensure public involvement at all stages and levels of development.

#### B. Policy Statement

Concurrent with implementation of the HGM Approach, the Corps and the other Federal agencies will develop a policy statement clarifying how the HGM Approach can be used within the Section 404 and Swampbuster programs to improve regulatory decision making. The policy statement will address various issues, including how information on wetland functions generated by the HGM Approach will be used by regulators to make timely and consistent decisions that are reflective of the relative functional capacity of different wetlands. In addition, the policy statement will identify

supplemental procedures to be followed in applying the HGM Approach which ensure that other important, such as *red flagging* and the relative value of wetland functions, are to be considered in the decision making process.

In order to ensure that application of the HGM Approach meets its objectives of being timely, accurate and cost-effective, the agencies will conduct extensive field testing of regional guidebooks during the two-year operational draft period prior to development of the policy statement. The field testing will be conducted in cooperation with the States and other interested parties, as appropriate. The policy statement will be published in the **Federal Register** for public review and comment.

#### C. Implementation of the HGM Approach

Implementation of the HGM Approach is a multi-step procedure and will require the participation by several Federal, State, Tribal and local agencies, as well as experts from academia and the private sector. This participation will occur at all stages of the regional guidebook development process starting with identification and prioritization of regional wetland subclasses and initial model development through model calibration, verification, and validation of the revised model.

The first step of this multi-step procedure is to identify the national priorities for regional guidebook development of wetland subclasses through surveys of Corps district offices on what wetland types in their districts were under the greatest development pressure. The next step is to establish regional A-teams from participating agency specialists, academics and the private sector, that are trained in the HGM Approach and classification. The A-teams will identify and prioritize regional wetland subclasses, define the reference domain, and identify reference wetlands.

Once the regional subclasses and reference domain have been identified, conceptual assessment models for *wetland functions* will be drafted based on a review of both the literature and existing models. Model development will include selection of functions for each wetland subclass, selection and definition of variables for each function, and construction of assessment models. The draft models will then go through a peer-review technical workshop to provide individuals with expertise on hydrology, soils, vegetation and wildlife an opportunity to critique the draft assessment models. The workshop participants will include wetland

experts from Federal, State, Tribal, and local agencies, and individuals from academia and the private sector who will be an integral part of model development. At the workshop, the model will be critiqued and revised as needed to reflect recommendations from the workshop participants. After model review and revision, the draft model will be calibrated with data collected from reference wetland sites and field tested for accuracy and sensitivity of functional indices by the A-team. Models will be published as draft operational regional wetland subclass guidebooks (operational drafts) for a two year period. The operational draft will include a description and range of the regional wetland subclass, a functional profile, the assessment models, and application instructions with field data sheets. During this time, the operational draft models will be subjected to further extensive field testing by the Federal agencies, and review comments will be solicited from the public. Review comments will be incorporated into a final model. The final model will undergo review and revision as needed on a periodic basis (not to exceed a five-year period) to ensure that new technical data and research are incorporated into the model.

#### D. Agency Roles and Coordination

Given the magnitude of the effort, and the need for interdisciplinary expertise, implementation of the HGM Approach will require participation from several Federal, State, Tribal and local agencies, academia, private consultants and other wetlands experts. This will be coordinated in the following manner.

##### 1. National Interagency Implementation Team

The Action Plan, outlining the steps the federal agencies will follow in implementing the HGM Approach, will be administered by a National Interagency Implementation Team (Implementation Team) chaired by a representative from the U.S. Army Corps of Engineers. Other agencies represented on the Implementation Team will be the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), USDA—Natural Resources Conservation Service (NRCS), the Federal Highway Administration (FHWA), and NOAA—National Marine Fisheries Service (NMFS). Technical assistance will be provided to the Implementation Team by representatives of WES and others involved in the development of the HGM Approach.

The Implementation Team is responsible for ensuring that the Action

Plan is implemented in a consistent and timely fashion, and that the concerns and priorities of each agency are considered. They will meet as needed to assess progress, ensure timely development of products, and address problems and potential inconsistencies.

## 2. Regional Assessment Teams

Regional assessment teams (A-teams) will include scientists with expertise in wetland hydrology, biochemistry, soils, plants, and wildlife. Representation on the A-Team will be from each agency whenever possible. The USACE representative will serve as the A-team leader. The primary responsibilities of the A-team are as follows:

- Identify regional wetland subclasses and define reference domains.
- Identify reference wetland sites.
- Identify and define functions for each subclass.
- Identify and define variables and construct assessment models.
- Conduct interagency and interdisciplinary workshop to critique models.
- Collect data from reference wetland sites and establish reference standards.
- Calibrate assessment models using reference wetland data.
- Verify and validate the assessment models.

A-teams will meet as needed during implementation of the HGM Approach. A-teams will solicit technical input from other wetland experts from the academic and private sectors as necessary to accomplish their objectives. It is anticipated that development of each regional guidebook will require approximately one year to complete.

## 3. WES as Technical Support Center

WES will serve as the primary technical support center for coordinating the development of regional guidebooks. WES will publish guidance for developing regional guidebooks ("Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks"), and facilitate publication of the regional guidebooks and other documents related to the HGM Approach. WES will also serve as the center for training and outreach activities related to the HGM Approach.

## 4. Coordination With State, Tribal and Local Agencies, Academia and the Private Sector

It is the intent of the Federal agencies to involve representatives from appropriate State, Tribal and local agencies, as well as local experts from academia and the private sector in the development of regional guidebooks.

Input will be solicited regarding the technical accuracy of the assessment models, as well as its applicability to Federal, State, Tribal and local wetlands programs. The A-team will be responsible for identifying individuals outside of the Federal government with expertise on the hydrology, biogeochemical processes, soils, and habitat functions of the regional wetland subclass to participate in assessment model development and the peer review.

It is anticipated that many State regulatory and/or resource agencies will be interested in taking the lead in developing regional guidebooks using the HGM Approach for their own regulatory programs and other purposes. It is also anticipated that the private sector may take the lead in regional guidebook development for use in Federal programs. Regional guidebooks developed by State agencies and the private sector may be accepted for use within Federal programs if the standard guidance for developing regional guidebooks, "Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks", is followed. For this reason, States and others are encouraged to coordinate with WES at the initiation of the project to ensure consistency with Federal efforts. The Federal agencies will work to establish collaborative efforts with States in the development of regional guidebooks to ensure maximum efficiency of both efforts and the broadest possible application.

Many States have on-going research supporting the development of monitoring programs to characterize and assess the condition of their wetland resources. The HGM Approach provides a useful framework for targeting States' data collection and research efforts. Many States have increased their efforts to classify, monitor, and/or document the ecological condition of their wetlands in recent years. Much of the data from these activities can support the development of regional guidebooks for the HGM Approach. Federal and State agencies undertaking the development of regional guidebooks are encouraged to coordinate with these State research and monitoring programs to facilitate an exchange of technical information.

## 5. Public Involvement

It is the intent of the Federal agencies that the public be aware of the overall development of the HGM Approach and have ample opportunity to review and provide comments on all draft documents. To this end, information will be provided on the Internet at the WES homepage ([www.wes.army.mil/el/](http://www.wes.army.mil/el/)

wetlands/wetlands.html/). The agencies will also provide additional forums (e.g., public workshops) to facilitate public awareness of the implementation of the HGM Approach, development of regional guidebooks, and other related publications.

## E. Quality Control for Regional Guidebook Development

The Implementation Team will maintain oversight to ensure that regional guidebook development focuses on priority wetland types and meets agency needs. The agencies recognize that the steps needed to develop each regional guidebook will vary based on the unique circumstances of each effort. However, certain minimum requirements must be met to ensure consistency, technical accuracy, and interagency support for use of the regional guidebooks within the Federal regulatory framework and other programs. Draft guidance from WES for developing regional guidebooks, "Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks", is outlined in Table 2.

### Table 2.—Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks

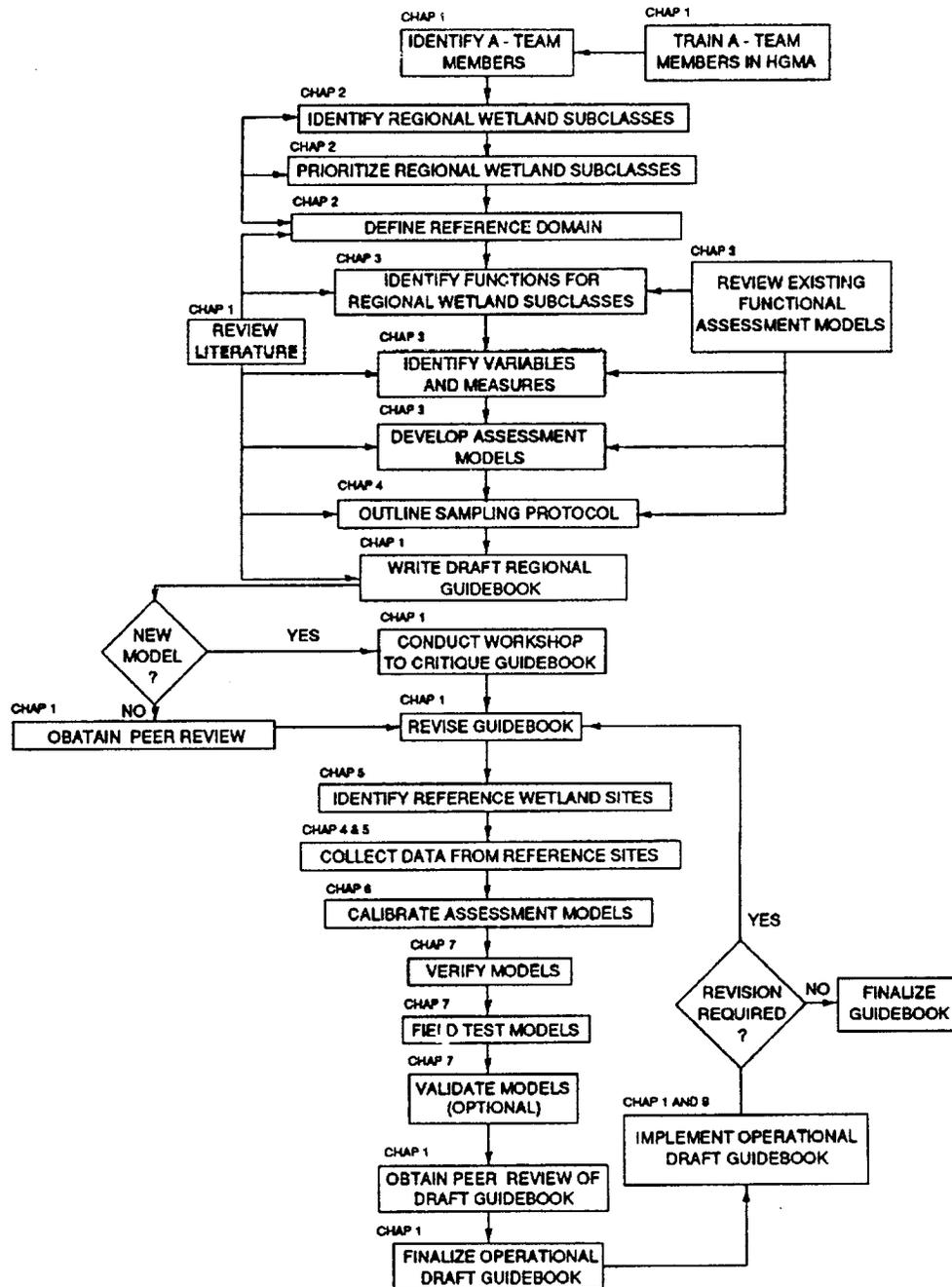
Chapter 1. Introduction and Overview
Chapter 2. Identifying and Characterizing Regional Subclasses
—Identify and define functional profile of regional subclass
Chapter 3. Constructing Conceptual Assessment Model
Chapter 4. Reference Wetlands
—Define reference
—Identify reference wetlands
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—Standardized approach to managing data
Chapter 6. Data Analysis and Model Calibration
—How data is used
—How is data used to calibrate models
Chapter 7. Verification and Validation of HGM Assessment Models
—Model logic
—Testing model application in the field
—Relationship between FCI and an independent measure of function
Chapter 8. Applications of HGM

These chapters contain information necessary for the characterization of regional subclasses, data collection and management from reference wetland

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sites, model construction, data analysis, and model calibration, verification, and validation. Figure 1 depicts the HGM regional guidebook development process that follows the information contained within the "Guidelines for Developing Hydrogeomorphic Regional Guidebooks".

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**Figure 1.** The HGM regional guidebook development process. Chapter numbers reference chapters of the “Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks”.

At a minimum, regional guidebooks must contain the following information to be complete:

- Purpose and format of the regional guidebook
- An introduction to the HGM Approach
- A functional profile of the regional wetland subclass
  - Guidance for selecting reference wetland sample locations
  - Guidance for selecting and sampling of reference standard wetlands
- Documentation of the functions of the regional wetland subclass
  - Guidance on the application of the regional guidebook models in the field including the materials needed to take to the field.
- Any appendices addressing reference data sites and the field sheets used to collect the data, any raw/summarized information needed to support the model or calibration of the model, and any other information that may be specific to the regional guidebook.

Regional guidebooks developed by A-teams other than those formed by the Federal agencies are required to follow the guidance developed by WES for developing regional guidebooks if these regional guidebooks are to be used within Federal programs. Entities undertaking separate efforts to develop HGM functional assessment models are encouraged to inform the Corps promptly of their intent and provide timely opportunities for agency participation and review. Any regional guidebook developed by an entity other than the Federal agencies must be reviewed and approved by the Federal agencies prior to application under Federal programs to ensure consistency with quality assurance steps outlined in this document, including agency and private sector peer review.

#### F. Training and Outreach

##### 1. Training

Training in the HGM Approach will be necessary to ensure consistent development and application of regional assessment models. Different training courses, ranging from an introductory course to familiarize program administrators and field personnel with the HGM Approach to technical training in regional subclass model development and the application of the HGM Approach are proposed as follows:

A. "Introductory Course to the HGM Approach to Wetland Assessment"—This course will be designed for executive and management personnel who need to understand the basics of the HGM Approach. The course will be

approximately three days in length and provide background on the HGM Approach, including the conceptual basis of HGM regional guidebook development and application.

B. "HGM Application Course"—A second course will be offered to those individuals directly responsible for assessing wetland functions in the field using a regional guidebook. The course objective will be to ensure students are as proficient as possible in applying regional subclass models and in evaluating their results. The course will focus on the application of models under different scenarios such as project impact assessment, alternative analysis, and mitigation design/monitoring. It will require a full five days to complete with considerable emphasis on field work. This course will be offered through the Corps regulatory training curriculum. (Under development.)

C. "HGM Regional Guidebook Development"—This course will be designed for personnel responsible for drafting and testing new regional guidebook models. Students will be provided information on the sequence of steps necessary to develop models and the lessons learned from prior development efforts. The course will be approximately three days long and include field exercises on identifying and collecting data from reference wetlands. (Under development.)

D. "Train the Trainers"—A fourth course will be offered to train those individuals who will be responsible for local training. The course objective will be to enable students who are proficient in the HGM Approach and regional guidebook development to train others in the HGM Approach, regional guidebook development, and application. This course will be two days in length with a prerequisite of having extensive experience in the HGM Approach.

##### 2. Outreach

In addition to this Action Plan and the training courses the Federal agencies are proposing, additional outreach efforts are planned to ensure that State, Tribal, local agencies and the general public are informed on the HGM Approach, including the direction the Federal agencies will follow in developing and implementing the HGM Approach. The following efforts will be made over the next few years to meet that objective.

All technical publications included under the HGM Approach (e.g., national and regional guidebooks, and supporting technical documents) will be published by WES under an interagency logo. Once published, these documents

may be obtained by interested parties through an appropriate Federal publications office, including the National Technical Information Service (NTIS). In addition, WES has developed a homepage on the Internet dedicated to the HGM Approach to make pertinent documents available electronically. The homepage will include a quarterly publication to update interested readers on the status of efforts to develop and implement the HGM Approach. Among the information included in this publication will be a current listing of completed national and regional guidebooks (including both operational and final drafts), as well as information concerning the status of other models under development. The homepage can be accessed by the following address: <http://www.wes.army.mil/el/wetlands/wetlands.html>.

WES will also serve as the Federal lead for keeping the scientific community informed about the HGM Approach through the presentation of information at appropriate professional meetings and through technical publications. Similarly, the Federal agencies will make information available to professional trade organizations and journals to ensure that the regulated community and others are informed on the development of the HGM Approach. EPA's Wetlands Information Hotline (1-800-832-7828) will also serve as a distribution center for HGM materials. In addition to the Federal agency training programs described above, it is anticipated that private wetland training institutes will begin to provide additional training opportunities for both the public and private sectors. In addition to these formal training programs, the agencies anticipate sponsoring short seminars on the HGM Approach to respond to local interests or needs.

#### IV. HGM Documents

The following documents have been or are expected to be published by WES as part of the development strategy. Published documents are available through the NTIS at (703) 487-4650.

A. "HGM Classification of Wetlands" (Brinson 1993)—This document lays out an approach for classifying wetlands into similar functional types (classes and subclasses) based on their hydrogeomorphic characteristics. Wetlands are initially classified based on three major characteristics: (1) geomorphic setting, (2) water source, and (3) hydrodynamics. The seven major wetland classes are depression, slope, flats, fringe, and riverine. The classification is not intended to supersede or replace other wetland

classification methods designed for purposes other than functional assessment.

B. "Procedural Document" (Smith et al 1995)—This document establishes the guiding rules for model development and application of the HGM Approach. Included is standard guidance for wetland bounding, characterization and assessment using a regional assessment model, as well as guidance for development of A-teams and assessment models.

C. "Guidelines for Developing Hydrogeomorphic Approach Regional Guidebooks" (Clairain ed. In Prep)—This document, currently under development, establishes guidelines for developing regional guidebooks and addresses the information necessary for the characterization of regional wetland subclasses, data collection and management from reference wetland sites, model construction, data analysis, and model calibration, verification, and validation. These guidelines must be followed if the regional guidebook is to be used within the Section 404 regulatory program and other Federal programs.

D. "National Guidebooks"—These documents will provide the basis for applying the HGM Approach for wetland functional assessment to one of the seven major classes of wetlands:

- Riverine Wetlands (Brinson et al 1995)
- Depressional Wetlands (In Prep)
- Estuarine Fringe Wetlands (In Prep)
- Lacustrine Fringe Wetlands
- Slope Wetlands (In Prep)
- Mineral Soil Flats
- Organic Soil Flats

Each national guidebook will serve as a template from which regional guidebooks can be developed. Each document will identify and describe the wetland class, description of selected functions, variables, and rationale, including supporting literature. The document will lack field calibration and specifics on reference standards. National guidebooks will be published initially as operational drafts for a two-year period, to allow the public to provide comments on the information contained within. Revisions will be made in response to field review and public comment and a final guidebook will be published.

E. "Regional Guidebooks"—Regional Guidebooks represent a regionalization for wetland subclasses, of the National Guidebooks, through modification, calibration, and testing to determine effectiveness under local and regional conditions. Regional guidebooks will contain an introduction to the HGM Approach, a functional profile of the

regional wetland subclass, guidance for selecting reference wetland sample locations, guidance for selecting and sampling of reference standards, purpose and format of the regional guidebook, documentation of the functions of the regional wetland subclass, guidance on the application of the regional guidebook models in the field including the materials needed to take to the field. This document will also contain appendices addressing reference data sites and the field sheets used to collect the data, any raw/summarized information needed to support the model or calibration of the model, and any other information that may be specific to the regional guidebook.

The regional guidebook, having been reviewed by an interagency panel and an interdisciplinary team of experts familiar with the region and wetland subclass, will be published by WES as an Operational Draft of the regional guidebook for that wetland subclass, for a two-year period. The preface in each operational draft will contain a statement and address for soliciting review comments. Each operational draft will be made available for public use for a two year period, during which time comments and recommendations for revisions will be accepted. The operational draft will be revised to reflect recommended changes in the models and the revised models will then be published as a Final Regional Guidebook.

Each final regional guidebook will remain in use for a period not to exceed five years before any revisions are made. During this five year period, it will be reviewed by an interdisciplinary team and an interagency panel to assess changes in the state of wetland science, including the applicability of new data and research on the particular wetland subclass. It will then be determined if the regional models need revising. If revisions are required, the final regional guidebooks will be revised and republished.

#### V. Application of HGM Approach

One of the primary benefits of the HGM Approach is that it provides a method to rapidly and consistently assess the level of environmental impact of a proposed project. This information is particularly valuable within the review of Section 404 permit applications where the HGM Approach can assess the ability of a wetland to perform a specific function before and after the proposed discharge of dredged or fill material. As such, the evaluation can be useful in identifying the least damaging project alternative as required

by the Section 404 program. Moreover, the method provides regulators with a more predictable tool to gauge the level of environmental impact and, therefore, to more consistently determine the appropriate regulatory response, i.e., ensure that the level of review is commensurate with the degree of environmental impact and based upon the best available scientific information.

NRCS, in its administration of the Food Security Act of 1985, as amended, is tasked with determining impacts to wetland functions due to conversions or proposed conversions on agricultural lands. Such determinations must be made in order to implement the "minimal effects" and mitigation exemptions which are provided in the Food Security Act. Under the minimal effects exemption, NRCS will identify thresholds to determine whether a conversion activity is minimal. The information provided from an HGM assessment can be compared to the thresholds and provide the basis for making a minimal effect determination. HGM assessment information will also provide the needed data to determine mitigation requirements when granting a mitigation exemption.

The HGM Approach also provides important information to determine the nature and level of compensatory mitigation that is needed to effectively offset impacts to wetlands. Identifying the degree to which a project may adversely affect the hydrologic, biogeochemical, and habitat functions of a particular wetland enables regulators to more accurately determine the amount and type of compensatory mitigation required to offset the adverse impacts. In addition, the indicators and variables used to establish the assessment model may provide performance standards with which mitigation projects can be monitored to determine compliance.

In addition, the HGM Approach may also be applied to mitigation banking (the creation, restoration, or enhancement of wetlands expressly for the purpose of providing compensatory mitigation for multiple projects.) The HGM approach can be used to determine the appropriate number of credits available at a mitigation bank and also to establish performance standards to measure the success of the project in meeting stated goals.

The HGM Approach can be applied to determine the relative functional capacity index of wetlands in a particular geographic area within a watershed planning or wetland restoration effort, which typically involves the collection and distribution of data on the functions of wetlands in

the area. The information gathered can be used to make management decisions on the location of future development within the watershed and the protection of its aquatic resources. Where existing regional subclass models are not available, a watershed planning effort may provide the basis from which a regional assessment model can be developed. In such cases, the model can be tailored to meet the specific application of the planning effort.

The HGM Approach may also be used in the context of a State's wetland water quality standards program. The HGM Approach provides a useful framework for targeting States' data collection and research efforts. Many States have increased their efforts to monitor and document the ecological condition of their wetlands. This information is then used to define more appropriate and specific wetland water quality standards, to report on the health of States' aquatic systems, and to set performance standards for wetland restoration and mitigation projects. The indicators and variables identified in a regional guidebook can serve as the basis for establishing narrative or numeric criteria used to assess whether an established standard has been met.

The above list of potential applications of the HGM Approach will be more fully addressed in the "Guidelines for Developing

Hydrogeomorphic Approach Regional Guidebooks'.

**VI. Schedule**

The HGM Approach is being implemented in three phases. Phase I, initiated in 1995, focused on developing functional assessment models and regional guidebooks for priority regional wetland subclasses including: (a) South-Central Florida flats and depressions and flats of the Everglades; (b) Western Kentucky and Tennessee riverine (low gradient, low order); (c) Vernal pools in California; (d) Prairie potholes of the northern plains states; (e) Southeast Pine Flatwoods, and (f) Coastal Fringe of the Texas Gulf Coast. Phase II, initiated in 1996, consists of an expanded nationwide effort to develop functional assessment models and regional guidebooks in approximately 15-20 additional regional wetland subclasses in order to achieve the goal of having a sufficient number of assessment models to address 80 percent of the priority Section 404 permit workload requiring functional assessments. (See Table 3) Under Phase III, functional assessment models and regional guidebooks will be developed for all remaining regional wetland subclasses identified.

**A. Phase I—Pilot Projects—1995**

Phase I of the Action Plan was initiated in 1995 and is focused on developing regional guidebooks for regional wetland subclasses of national

priority as identified by a survey sent to Corps Districts. National priorities were determined and pilot Corps Districts selected by surveying field offices and identifying those types of wetlands which are experiencing the most development pressure, are threatened due to scarcity, and/or are complex and difficult to assess. A-teams were established to identify reference wetlands and develop functional indices for these priority regional wetland subclasses. The number of A-teams formed was dependent upon the availability of personnel, time, and financial resources, consistent with established national priorities. A training workshop was held for A-team members to ensure consistency in the efforts to develop regional subclass models. The A-teams initiated technical meetings to accomplish tasks such as: the identification of functions relevant to the particular wetland subclass, the review of existing assessment models, the selection of reference wetlands, the identification of variables, and the development and testing of functional indices. The objective of Phase I was to develop functional indices for priority regional wetland subclasses, and establish protocol for identifying reference wetlands and developing assessment models for additional regional subclasses during Phase II and Phase III in a consistent, systematic, and accurate manner.

TABLE 3.—STATUS OF DEVELOPMENT OF REGIONAL GUIDEBOOKS

Component	Contributing agency(ies)*	Product	Projected completion	Current status
<b>National Documents:</b>				
National Action Plan .....	COE/WES .....	Technical Report .....	Apr. 97 .....	Draft Complete.
Procedural Document .....	COE/WES .....	Technical Report .....	Apr. 96 .....	Published.
Guidelines for Developing Hydro-geomorphic Approach Regional Guidebooks.	COE/WES .....	Technical Report .....	Dec. 97 .....	Initiated Jan. 97.
Classification Report .....	COE/WES .....	Technical Report .....	Jun. 93 .....	Published.
<b>National Guidebooks:</b>				
Riverine Wetlands .....	COE/WES .....	Operational Draft .....	May 96 .....	Completed.
Depressional Wetlands .....	COE/WES/FWS .....	Operational Draft .....	Dec. 97 .....	Initiated Oct. 96.
Slope Wetlands .....	COE/WES .....	Operational Draft .....	Dec. 97 .....	Workshop held Oct. 96.
Fringe: Estuarine .....	COE/WES .....	Operational Draft .....	Oct. 97 .....	Workshop held Sep. 96, Draft complete.
Fringe: Lacustrine .....	COE/WES .....	Operational Draft .....	.....	Pending Funding.
Flats .....	COE/WES .....	Operational Draft .....	.....	Pending Funding.
<b>Regional Slope Guidebooks:</b>				
Forested Slope Wetlands of New England—Massachusetts, New Hampshire, Vermont.	COE/WES .....	Operational Draft .....	May 98 .....	Workshop Jul. 96.
<b>Regional Riverine Guidebooks:</b>				
Low gradient 2nd or 3rd order streams in Western Kentucky and Tennessee.	COE/WES/TN DEC ...	Operational Draft .....	Jul. 97 .....	Workshop May 96, Draft Complete.
Low gradient 2nd or 3rd order streams in the Northern Rockies—Montana.	COE/WES/EPA/ States/Private/ FHWA.	Operational Draft .....	Dec. 97 .....	Workshop held in Apr. 96.

TABLE 3.—STATUS OF DEVELOPMENT OF REGIONAL GUIDEBOOKS—Continued

Component	Contributing agency(ies) *	Product	Projected completion	Current status
Regional Depressional Guidebooks: Prairie Potholes—North Dakota .....	NRCS/COE/WES .....	Operational Draft .....	Dec. 97 .....	Workshop Jun. 95, Draft completed.
Depressions in South and Central Florida	COE/WES .....	Operational Draft .....	Oct. 97 .....	Workshop held Feb. 96.
Vernal Pools of the Central Valley of California.	COE/WES .....	Operational Draft .....	Sep. 98 .....	Workshop held May 96.
Herbaceous Depressions of the Northern Rockies—Montana.	COE/WES/EPA/ States/Private/ FHWA.	Operational Draft .....	Oct. 97 .....	Workshop held Apr. 96.
Regional Fringe: Coastal Guidebooks: Coastal Wetlands of the Texas Coast .....	COE/WES/EPA .....	Operational Draft .....	Oct. 98 .....	Initiated Jan. 97, Workshop scheduled for Nov. 97.
Regional Fringe: Lacustrine Guidebooks: Tulsa .....	COE/WES/EPA .....	Operational Draft .....	Oct. 98 .....	Initiated Jan. 97.
Regional Flats Guidebooks: Herbaceous Flats in South and Central Florida.	COE/WES .....	Operational Draft .....	Oct. 97 .....	Workshop held Feb. 96.
Flats in the East Everglades of Florida .....	COE/WES .....	Operational Draft .....	Oct. 97 .....	Workshop held Apr. 96.
Pine Flatwoods of the Southeastern US ...	FHWA/EPA .....	Operational Draft .....	Dec. 97 .....	Initiated May 96.

Note: \*=Agency abbreviations are listed below.  
 COE—U.S. Army Corps of Engineers Headquarters and Districts.  
 WES—U.S. Army Engineer Waterways Experiment Station.  
 EPA—U.S. Environmental Protection Agency Headquarters and/or regional offices.  
 NRCS—U.S.D.A. Natural Resources Conservation Service.  
 FHWA—Federal Highway Administration.  
 FWS—U.S. Fish and Wildlife Service.  
 TN DEC—Tennessee Department of Environmental Conservation,

Five regional guidebooks are currently under development representing depressional wetlands (prairie potholes in the northern plains states and vernal pools in the Central Valley of California), riverine wetlands (low gradient streams in western Kentucky/Tennessee), flats (flats in the East Everglades of Florida), and flat/depressional mosaics in Florida. Table 3 identifies the current status of these regional guidebooks and their anticipated completion dates.

*B. Phase II—Expanded Nationwide Effort*

Phase II, initiated during 1996, consists of an expanded nationwide effort to develop regional guidelines in approximately 15–20 additional regional wetland subclasses. Regional guidebooks developed in Phase II will use the same protocol as described for Phase I. As identified in Table 3, efforts currently underway as part of Phase II include the development of assessment models for riparian systems, herbaceous depressional and slope wetlands in the

northern Rocky Mountains, forested slope wetlands in New England, and coastal fringe wetlands of the Gulf of Mexico. In addition to the efforts being led by the Federal agencies, there are also efforts in regional guidebook development being led by various states under EPA's State Grant Program. These efforts to date are listed in Table 4. However, it should be recognized that expanded efforts in this Phase will not address all regional wetland subclasses. The number of efforts initiated is dependent upon the availability of personnel, time, and financial resources.

TABLE 4.—STATUS OF OTHER HGM EFFORTS, FUNDED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY (INCLUDING EPA STATE/TRIBAL WETLAND GRANT PROGRAM)

Component	Contributing agency(ies)	Product	Projected completion	Current status
Regional Riverine Guidebooks: Low gradient riverine wetlands in the lower Mississippi River Valley.	EPA/COE–WES .....	Operational Draft .....	Sep. 98 .....	Initiated Apr 97.
Riverine Wetlands of the Santa Margarita Watershed in Southern California.	EPA .....	Operational Draft .....	Oct. 98 .....	Draft complete, undergoing peer review prior to workshop review.
Riverine/slope wetlands of southeast Alaska.	Alaska DEC/SGP .....	Operational Draft .....	Oct. 97 .....	Draft undergoing peer review.
Riverine wetlands in 1st–2nd order headwater reaches in Pennsylvania and Maryland.	EPA .....	Operational Draft .....	Mar. 99 .....	Initiated May 94.
Riverine wetlands along broad floodplains associated with streams greater than 2nd order in Pennsylvania and Maryland.	EPA .....	Operational Draft .....	Mar. 99 .....	Initiated May 94.

TABLE 4.—STATUS OF OTHER HGM EFFORTS, FUNDED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY (INCLUDING EPA STATE/TRIBAL WETLAND GRANT PROGRAM)—Continued

Component	Contributing agency(ies)	Product	Projected completion	Current status
Flow through and impounded riverine wetlands in Washington.	Washington Dept of Ecology/SGP.	Operational Draft .....	Jan. 98 .....	Workshop held May 97.
Low gradient riverine wetlands of the Great Colorado Plateau and Rocky Mt. region.	Utah Governor's Office of Planning/SGP.	Operational Draft .....	Mar. 98 .....	Data collection.
Riverine wetlands of Kenai watershed Alaska.	AK DEC/FWS/ Kenai Peninsula Borough/SGP.	Operational Draft .....	Sep. 98 .....	Fieldwork Jul 97.
Regional Slope Guidebooks: Slope wetlands in Pennsylvania .....	EPA .....	Operational Draft .....	Dec. 98 .....	Initiated May 94.
Regional Depression Guidebooks: Flowthrough and closed depression wetlands in Washington.	Washington Dept of Ecology/SGP.	Operational Draft .....	Jan. 98 .....	Workshop held May 97.
Depression wetlands in Pennsylvania .....	EPA .....	Operational Draft .....	Dec. 98 .....	Initiated May 94.
Depression wetlands in Guam .....	EPA .....	Operational Draft .....	Dec. 99 .....	Initiate in Aug 97.
Regional Flats Guidebooks: Flats wetlands on discontinuous permafrost in interior Alaska.	AK DEC/NRCS/DOA/SGP.	Operational Draft .....	Jul. 97 .....	Workshop held Apr 97.
Regional Fringe Guidebooks: Tidal freshwater marshes of the Hudson River, New York.	NY DEC/COE/Hudson River Improvement Fund/SGP.	Operational Draft .....	Dec. 98 .....	Pre-draft guidebook completed.
Other: Characterization and functional assessment of reference wetlands of the southern and central Rocky Mountains.	Colorado Geological Survey/SGP.	Grant Report .....	Jun. 98 .....	Initiated Aug 96.

Note: \*=Agency abbreviations are listed below:  
 COE—WES—U.S. Army Corps of Engineers.  
 EPA—U.S. Environmental Protection Agency.  
 SGP—EPA's State/Tribal Wetland Grant Program.  
 NRCS—U.S.D.A. Natural Resources Conservation Service.  
 AK DEC—Alaska Department of Environmental Conservation.  
 NY DEC—New York Department of Environmental Conservation.  
 DOA—Department of the Army.

In addition to the development of regional guidebooks, the Corps and the other Federal agencies, will work together during Phase II, to develop necessary guidance on how the HGM Approach may be applied in the review of Section 404 permit applications. The intent of the guidance is to clarify how information from an assessment can be used to determine the level of environmental impacts a proposed project may cause and the appropriate regulatory response.

*C. Phase III*

Based on the needs of the Federal agencies and work conducted to date by others, the agencies will establish a priority listing of additional models to be developed.

**VII. Funding**

Primary funding for the Federal effort to develop the HGM Approach has been and will continue to be provided through the Corps, with additional support being provided by other federal agencies, including EPA, NRCS, FWS, NMFS, and FHWA. As development of the approach continues, limited Federal

funds will be available for the development of each regional guidebook to support tasks such as the collection of data, training, and technical workshops. The cost for developing regional guidebooks is expected to vary depending on the scope of the effort and the level and nature of participation by Federal, State, Tribal and local agencies and the private sector. For State, Tribal and certain local efforts, EPA's State Wetlands Grant Program has made funding available for those agencies wishing to pursue an HGM Approach within their wetlands program. Interested State, Tribal and local agencies should contact the local EPA office for further information.

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## Appendix A

### Definition of Terms

**Assessment Model:** A simple model that defines the relationship between ecosystem and landscape scale attributes and processes and functional capacity of a wetland. The model is developed and calibrated using reference wetlands from a reference domain.

**Assessment Objective:** The reason why an assessment of wetland functions is being conducted. Assessment objectives normally fall into one of three categories. These include: documenting existing conditions, comparing different wetlands at the same point in time (e.g., alternatives analysis, and comparing the same wetland at different points in time (e.g., impact analysis or mitigation success).

**Assessment Team (A-Team):** An interdisciplinary group of regional and local scientists responsible for identifying regional wetland subclasses, identification of reference wetlands, construction of assessment models, definition of reference standards, and calibration of assessment models.

**Functional Assessment:** The process by which the capacity of a wetland to perform a function is measured or estimated. The Hydrogeomorphic Approach measures capacity using an assessment model to determine a functional capacity index.

**Functional Capacity:** The rate or magnitude at which a wetland ecosystem performs a function. Functional capacity is dictated by characteristics of the wetland ecosystem and the surrounding landscape, and interaction between the two.

**Functional Capacity Index (FCI):** An index of the capacity of a wetland to perform a function relative to other wetlands within a regional wetland subclass in a reference domain. Functional capacity indices are by definition scaled from 0.0 to 1.0. An index of 1.0 indicates the wetland performs a function at the highest sustainable functional capacity, the level equivalent to a wetland under reference standard conditions in a reference domain. An index of 0.0 indicates the wetland does not perform the function at a measurable level, and will not recover the capacity to perform the function through natural processes.

**Highest Sustainable Functional Capacity:** The level of functional capacity achieved across the suite of functions by a wetland under reference standard conditions in a reference domain. This approach assumes that the highest sustainable functional capacity is achieved when a wetland ecosystem and the surrounding landscape are undisturbed.

**Hydrogeomorphic Wetland Class:** The highest level in the hydrogeomorphic wetland classification. There are seven basic hydrogeomorphic wetland classes including depressional, fringe—lacustrine and coastal, slope, riverine, and flat—mineral and organic.

**Project Target:** The level of functioning identified for a restoration or creation project. Conditions specified for the functioning are used to judge whether a project reaches the target and is developing toward site capacity.

**Project Standards:** Performance criteria and/or specifications used to guide the restoration or creation activities toward the project target. Project standards should include and specify reasonable contingency measures if the project target is not being achieved.

**Red Flag Features:** Features of a wetland or the surrounding landscape to which special recognition or protection is assigned on the basis of objective criteria. The recognition or protection may occur at a federal, state, regional, or local level, and may be official or unofficial.

**Reference:** Standard for measuring, reckoning, or constructing.

**Reference Domain:** The geographic area from which reference wetlands are selected. A reference domain may or may not include the entire geographic area in which a regional wetland subclass occurs.

**Reference Standard Wetlands:** The sites within a reference wetland data set from which reference standards are developed. Among all reference wetlands, reference standard sites are judged by an interdisciplinary team to have the highest level of functioning.

**Reference Standards:** Conditions exhibited by a group of reference wetlands that correspond to the highest level of functioning (highest, sustainable level of functioning) across the suite of functions performed by the regional wetland subclass. The highest level of functional capacity is assigned an index score of 1.0 by definition.

**Reference Wetlands:** Wetland sites that encompass the variability of a regional wetland subclass in a reference domain. Reference wetlands are used to establish the range of conditions for construction and calibration of

functional indices and establish reference standards.

**Regional Wetland Subclass:** Wetlands within a region that are similar based on hydrogeomorphic classification factors. There may be more than one regional wetland subclass identified within each hydrogeomorphic wetland class depending on the diversity of wetlands in a region, and assessment objectives.

**Site Potential:** The highest level of functioning possible, given local constraints of disturbance history, land use, or other factors. Site capacity may be equal to or less than levels of functioning established by reference standards for the reference domain, and it may be equal to or less than the functional capacity of a wetland ecosystem.

**Wetland Functions:** The normal activities or actions that occur in wetland ecosystems, or simply, the things that wetlands do. Wetland functions result directly from the characteristics of a wetland ecosystem and the surrounding landscape, and their interaction.

[FR Doc. 97-15959 Filed 6-19-97; 8:45 am]

BILLING CODE 3710-92-P

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## DEPARTMENT OF ENERGY

[Docket No. EA-48-L]

### Issuance of Temporary Order; El Paso Electric Company

**AGENCY:** Office of Fossil Energy, DOE.

**ACTION:** Notice of Issuance of Temporary Order and Request for Comments.

**SUMMARY:** Notice is hereby given that of DOE has issued El Paso Electric Company (EPE) a Temporary Order in FE Docket EA-48-L that authorizes EPE to increase the level of electricity exports to Mexico from 200 MW to 210 MW for the summer months of 1997.

**DATES:** Comments, protests or requests to intervene must be submitted on or before July 7, 1997.

**ADDRESSES:** Comments, protests or requests to intervene should be addressed as follows: Office of Coal & Power Im/Ex (FE-27), Office of Fossil Energy, U.S. Department of Energy, 1000 Independence Avenue, SW, Washington, DC 20585-0350 (FAX 202-287-5736).

**FOR FURTHER INFORMATION CONTACT:** Ellen Russell (Program Office) 202-586-5883 or Michael Skinker (Program Attorney) 202-586-6667.

**SUPPLEMENTARY INFORMATION:** Exports of electricity from the United States to a foreign country are regulated and