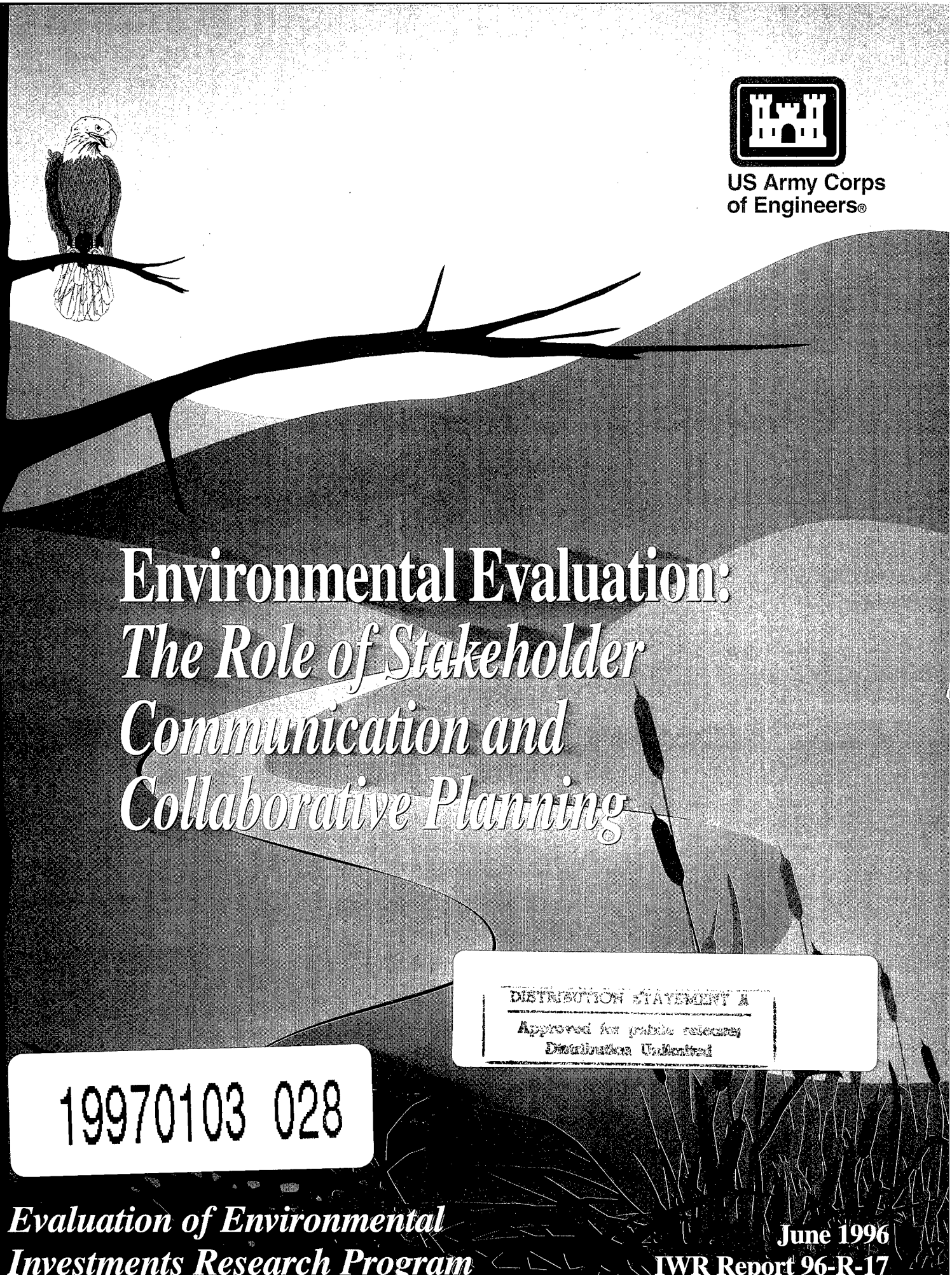

US Army Corps of Engineers®

Environmental Evaluation: *The Role of Stakeholder Communication and Collaborative Planning*

Evaluation of Environmental Investments Research Program

June 1996
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ENVIRONMENTAL VALUATION: THE ROLE OF STAKEHOLDER COMMUNICATION AND COLLABORATIVE PLANNING

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PREFACE

This study was conducted as part of the Evaluation of Environmental Investments Research Program (EEIRP). The EEIRP is sponsored by Headquarters, U.S. Army Corps of Engineers (HQUSACE). It is jointly assigned to the U.S. Army Engineer Water Resources Support Center (WRSC), Institute for Water Resources (IWR), and the U.S. Army Engineer Waterways Experiment Station (WES), Environmental Laboratory (EL). Mr. William J. Hansen of IWR is the Program Manager and Mr. H. Roger Hamilton is the WES Manager. Program Monitors during this study were Mr. John W. Bellinger and Mr. K. Brad Fowler, HQUSACE. The Field Review Group members that provided overall Program direction and their District or Division affiliations were: Mr. David Carney, New Orleans; Mr. Larry M. Kilgo, Lower Mississippi Valley; Mr. Richard Gorton, Omaha; Mr. Bruce D. Carlson, St. Paul; Mr. Glendon L. Coffee, Mobile; Ms. Susan E. Durden, Savannah; Mr. Scott Miner, San Francisco; Mr. Robert F. Scott, Fort Worth; Mr. Clifford J. Kidd, Baltimore; Mr. Edwin J. Woodruff, North Pacific; and Dr. Michael Passmore, WES (formerly with Walla Walla District).

The work was conducted under the Monetary and Other Valuation Techniques work unit of EEIRP. Dr. Gerald D. Stedge of IWR is the Principal Investigator. This report is one of a series of Technical Reports produced as part of this work unit, each of which will support the development of an Environmental Valuation Procedures Manual.

The work was performed by Planning and Management Consultants, Ltd. (PMCL), under Task Order 0013, Contract No. DACW72-94-D-0003. Dr. David A. Schkade of the University of Texas was the author in collaboration with Dr. Timothy D. Feather and Mr. Donald T. Capan of PMCL.

The report was prepared under the general supervision at IWR of Mr. Michael R. Krouse, Chief, Technical Analysis and Research Division; and Mr. Kyle E. Schilling, Director, IWR; and at EL of Mr. H. Roger Hamilton, Chief, RAB; Dr. Robert M. Engler, Chief, NRD; and Dr. John W. Keeley, Director, EL.

At the time of publication of this report, Mr. Kyle E. Schilling was Acting Director of WRSC and Dr. Robert W. Whalin was Director of WES. Commander of WES was COL Bruce K. Howard, EN.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF TABLES

EXECUTIVE SUMMARY

This study investigates how understanding the perspectives of stakeholders in U.S. Army Corps of Engineers (USACE) environmental projects might improve the identification and communication of project benefits. Valuation of project features is a central component of the Corps decision-making framework. The outputs of environmental projects are multiple, varied, and usually difficult to measure in monetary terms, given the current state of the art. Thus, while estimating the costs of various project alternatives is reasonably well understood, documenting and communicating project benefits requires a different approach. The question to be addressed here then is: How can the benefits be effectively communicated to decision makers?

This report is based, in part, on three case studies of current USACE environmental projects as well as interviews with USACE Headquarters personnel involved in policy making for or review of environmental projects. The case studies included a project in the Seattle District under Section 1135 authority, a general investigation project in the Baltimore District, and a project in the St. Paul District conducted under the Upper Mississippi River System Environmental Management Program. For each project, key stakeholders were first interviewed individually, and were then brought together for a facilitated group meeting. The goal of the interviews and meetings was to better understand project priorities from individual stakeholders and to observe interchange on selected issues among the stakeholders.

While the objective of this effort was originally framed as an attempt to improve communication to stakeholders about the benefits of environmental projects, it was observed that this was actually not a serious problem. Rather, the vast majority of stakeholders were easily convinced of project benefits (which were often their own ideas), and indeed more easily convinced than were some USACE personnel. The key to this buy-in seems to be a dedication to collaborative planning with early and frequent interaction between stakeholders and District personnel in project formulation and planning. Through these interactions, the concerns and desires of different stakeholders were surfaced, discussed, and incorporated into the development of project alternatives. Consequently, there was usually a strategic consensus among stakeholders about the general set of alternatives under consideration, and little need for additional explicit efforts to communicate benefits. While there still remained some differences concerning which particular alternative to select, these differences generally revolved more around how much to do or how to do it, rather than a lack of understanding of project benefits.

Two places where better communication of benefits would be helpful are between functions within USACE Districts, and between Districts and Headquarters. Environmental projects are new to USACE and have more uncertainty about all aspects than traditional flood control and navigation projects, from technical and scientific matters to the planning process. These characteristics make it more difficult for USACE personnel in different locations (or even across functions within a District) to agree on what constitutes an adequate representation of benefits. In part, this appears to result from anchoring on the well understood and more extensive and quantitative planning studies for flood control and navigation projects, and finding

it difficult to adequately adjust the mind set for the different realities of environmental projects. The communication and understanding of planning guidance also need improvement, since we found many instances in which District and Headquarters personnel had different interpretations of the same project authority.

Comprehensive stakeholder involvement appears to be essential not only to efficient and effective planning, but also to the stakeholder buy-in and commitment necessary for adaptive management, monitoring, and maintenance, since USACE will not maintain these projects. While the merits of collaborative planning are significant, the process must be carefully managed so that it does not devolve into an anarchy of the whims and idiosyncracies of the particular stakeholders involved. The requirements of USACE policies and project authorities must still be followed, and quantitative analysis should be conducted where valid models are available. Together with the institutional constraints faced by the other stakeholders (e.g., budget cycles, public hearing requirements), these requirements constrain the set of possible agreements among the stakeholders. The District project manager must take the lead in ensuring that these requirements are incorporated effectively into the collaborative planning process.

I. INTRODUCTION

SHIFTING VALUATION PARADIGM FOR ENVIRONMENTAL PROJECTS

What is the role of valuation in planning for environmental projects? This is a very important question being faced by the U.S. Army Corps of Engineers (USACE) environmental planning community. Valuation of traditional water resource projects, such as flood control and navigation, rely on values tied to National Economic Development (NED). The convenience of the NED criterion is that it is politically effective and straightforward to communicate. When asked why a project has been considered, testifying to the positive economic value that it brings the nation is easy to present -- it will bring X dollars to the nation. When asked to justify one project over another, again it is simple -- it brings X dollars to the nation and the other only brings Y dollars of NED.

However, there are many elements of environmental projects that are not easily described in NED terms. Consequently, while valuation remains a central feature of the decision-making framework, a shift in the traditional valuation paradigm is required. Valuation is a combination of *describing* and *prioritizing* the features of a project. One can see the tremendous analytical advantage of NED because both description and prioritization traits are provided. This convenience probably contributes to the confusion within the environmental planning community about the role of NED in these types of projects. But the time is upon us, where alternative (non-NED) means of describing and prioritizing environmental project features is crucial to effective plan formulation. USACE restoration guidance (EC 1105-2-210) states that valuation parameters of environmental projects:

> *do not need to exhibit net NED benefits and should be viewed on the basis of non-monetary outputs compatible with the P&G selection criteria, and be offered for consideration and budget support (p.8).*

While most agree that moving away from the NED valuation paradigm for environmental projects is logical and progressive, it brings with it a call for a new approach to valuation. This study examines the rudimentary issues of valuation -- an effective means of describing and prioritizing environmental features through communication among stakeholders. The communication issues are especially critical given the relative youth of the sciences that support the physical portrayal of complex environmental systems.

Certainly, advancements are being made on the physical modeling front that will enhance the planners ability to describe and prioritize environmental features. However, the pluralistic perspectives of the importance of environment within society -- perspectives even vary significantly among environmental groups -- strongly suggests a role for effective communication among stakeholders for valuation purposes. Schkade (in Feather et al. 1995) argues that the valuation of environmental outputs cannot be accomplished without a process of communication and negotiation among project stakeholders. However, embracing this collaborative approach does not eliminate the

need for careful measurement and analysis of those parts of the problem for which adequate tools are available. These analyses are a necessary and important input to the valuation process, but are no longer the sole or final criterion. Adding the element of negotiation is a way to deal with those issues that are not easily measured, and to combine them with those that are measured.

CORPS VALUATION RESEARCH AND GUIDANCE

The area of valuation for environmental projects is being examined under the USACE Evaluation of Environmental Investment Research Program (EEIRP). A range of topics are being examined under the EEIRP with the goal of developing practical tools and techniques for the Corps planning community that can lend support to two important questions:

(1) How can the Corps determine whether the recommended action from a range of alternatives is the most desirable in terms of the environmental objective being addressed?

(2) How should the Corps allocate limited resources among many "most desirable" environmental investment decisions?

These two questions, referred to as the "site" and "portfolio" questions, directly involve the need for valuation. Within the EEIRP is a work unit which focuses on monetary and nonmonetary valuation which has been guided by the following objectives:

- Identify relevant socioeconomic use and nonuse values associated with environmental projects;
- Improve the linkages between environmental output measures and necessary inputs to socioeconomic evaluation;
- Develop, test, and provide guidance for nonmarket monetary evaluation of environmental project outputs; and
- Develop a greater understanding of the decision processes of USACE project stakeholders.

These objectives and present Corps guidance indicate that if there are opportunities for portraying project outputs in monetary terms, it should be done. In some cases, Corps environmental projects are multipurpose and impact (positively or negatively) the ecosystem integrity of the project, as well as impacting the site in terms of traditional NED accounts.

For example, creation of a wetland may produce fish and wildlife habitat and improve ecosystem integrity, but it may also provide flood control benefits that can be assessed using NED procedures. If there are outputs that can be monetized within the planning constraints (time, budget, etc.), they should be evaluated accordingly. A significant thrust of the four objectives given above is to support the linkage between Corps environmental activities and socioeconomic (NED-based) goods and services.

The objectives of the EEIRP also point toward the importance of nonmonetary valuation. Corps guidance EC 1105-2-210 says:

> *Projects for ecosystem restoration will not -- in fact, cannot now -- be evaluated solely on the basis of net NED benefits. While the costs of such projects are measured in dollars, (including implementation costs and foregone NED benefits), the outputs of such projects are measured nonmonetarily in HU [habitat units] or other units that indicate positive changes in ecological resources, and in incidental NED benefits.*
>
> *Therefore, since costs are measured in monetary terms and outputs are measured in nonmonetary terms, they are not commensurable and it is not possible to calculate net benefits for restoration projects. Reports must describe the benefits attributed to the recommended plan, using monetary and nonmonetary units of measure (p. 17).*

Cost-effectiveness and incremental cost analyses play an important role in environmental project planning. The EEIRP dedicated a work unit to the development of these tools (Robinson et al. 1995). Cost effectiveness is a framework for identifying the least-cost alternative in terms of environmental output. Incremental cost analysis is then used to examine changes in costs for different levels of environmental output. These tools, while depending partially on monetary-based data (cost), do not suggest a value for an environmental project. They are frameworks for decision-making that aid the planning team in evaluating a range of alternatives to ensure that a defendable approach for creation of environmental outputs is identified.

Under current valuation guidance for USACE environmental projects, NED-based project outputs should be monetized if it can be done within the planning budget. Cost effectiveness should be conducted to ensure that the highest output is provided at each level of spending. However, cost-effectiveness analysis alone leaves an intended gap in the evaluation of alternatives because it does not answer the question: "Is it worth the cost?" In other words, it does not consider the value of the environmental project. In an attempt to reduce this gap, the objectives of this study are to:

1) Characterize stakeholders' perceptions of environmental planning;

2) Identify current communication contexts among stakeholders; and

3) Present how stakeholder perceptions and communication affect the determination of evaluation criteria for environmental projects.

Addressing these objectives will allow a more thorough consideration of stakeholder priorities and values, and will identify opportunities to improve the current environmental planning process based on the collaboration of the stakeholders.

TOWARD NONMONETARY VALUATION: COMMUNICATION AND COLLABORATION

The premise of the present paper is based on two concepts:

1) Environmental project valuation, which houses the description and prioritization of environmental outcomes, is greatly enhanced through collaborative planning; and

2) Efficient collaborative planning is promoted through effective communication among stakeholders.

Movement toward collaborative planning will require a change in management mind set. A common approach to project planning in the public sector is the "decide-announce-defend" model (Susskind & Cruikshank, 1987). Using this approach, an agency decides that a project should be built in a certain location, develops a proposed alternative (or a restricted set of alternatives), and then has a public meeting to obtain feedback. In this approach, the assumption is that the agency holds the expertise on the project, and that the role of the public is largely as a target of communication and persuasion coming from the agency. Since the public has relatively little influence in formulating and selecting the proposed action, it is not surprising that the required communication to them is regarded as a challenge. It is also predictable that these meetings are usually regarded with a certain amount of fear and loathing by agency personnel, who often feel that they are put in the position of "selling" the project to a potentially skeptical audience and also bracing themselves to "survive" an expected flood of critical comments. For example, Peterson and Horton (1995) document an instance in which the U.S. Fish and Wildlife Service developed an alternative for managing habitat for the golden-cheeked warbler in central Texas without consulting stakeholders, and endured considerable outrage and criticism from them as a result. While this caricature does not do full justice to the traditional USACE planning process, it does capture a mind set that appears to be quite common within the organization.

One way that the problem of stakeholder communication could be framed is that USACE needs to develop better methods for communicating key aspects of environmental projects to stakeholders (especially the value of project outputs). In this framing, USACE holds most of the relevant expertise, and stakeholders (particularly cost-sharing stakeholders) are reluctant participants in environmental projects, and therefore must be convinced of a project's value. This approach is based on a perspective that is rooted in the somewhat adversarial decide-announce-defend model of public involvement.

An alternative framing for the problem of stakeholder communication would be that USACE needs to embrace stakeholder participation in the planning process, and should focus on how best to design and manage it. In this framing, stakeholders hold at least some of the relevant expertise and other resources, and are willing participants in environmental projects who want to work with USACE to see that the projects are completed as efficiently and effectively as possible. The required communication comes as a result of early and frequent interactions between USACE and the stakeholders. For example, the value of a project may often need to emerge as a property of

discussions between the stakeholders (including USACE), rather than as the result of a single technical analysis. This approach is based on a collaborative model of public involvement (e.g., Gray, 1989; Gregory & Keeney, 1994; Susskind & Cruikshank, 1987).

OVERVIEW OF THE REPORT

In this report we will examine the appropriateness of these approaches to managing stakeholder communication in USACE environmental projects. There are three elements to our analysis.

First, Section 2 defines the term "stakeholder" and discusses how stakeholders can be identified in USACE environmental projects. It is important to understand the role of stakeholders in environmental projects in order to develop effective communication in the planning process.

Second, Section 3 identifies several key dimensions on which environmental projects differ from traditional USACE flood control and navigation projects. This comparative analysis offers arguments around very specific points about the unique features of environmental projects.

Third, Section 4 uses the discussions of stakeholder and environmental project features together as a basis for characterizing the communication challenges presented by environmental projects. Finally, Section 5 summarizes both the key themes surrounding stakeholder communication and ideas for improving it (these ideas are also mentioned in earlier Sections as they arise).

The analysis and discussions in this report draw on interviews with project stakeholders in three case studies of USACE environmental projects, as well as interviews with USACE Headquarters (HQUSACE) personnel, all conducted in 1995. Excerpts from these interviews are used in Section 3 to illustrate the ways in which environmental projects differ from USACE's traditional flood control and navigation projects, and in Section 4 to illustrate issues concerning communication in environmental projects. A detailed description of the projects is listed in Appendix A and the case study method appears in Appendix B. Appendix B presents the questionnaire guides used to gather information from the stakeholders, describes the execution of the focus groups, and provides examples of what products can result from the focus group application. Although the sites were not intentionally selected as exemplars of best practice, these three projects do demonstrate ways in which stakeholders can be successfully incorporated into the USACE planning process.

II. STAKEHOLDERS

Stake, noun. A share or interest, especially a financial one, in a property, a person, a business venture, or the like.

-- Websters Unabridged Dictionary, Second Edition

Stakeholders are groups and individuals who can affect, or are affected by a project.

-- adapted from Freeman (1984)

A **stakeholder** is an element of an organization's environment that places constraint on its available actions.

-- adapted from Thompson (1967)

WHAT IS A STAKEHOLDER?

In theory, the answer to the question posed in the title of this section is disarmingly simple: stakeholders are those who have a share or interest in the project. The slightly more specific definition offered by Freeman (1984) in his well-known book retains this simple intuitive appeal, and refines what is meant by an "interest." Thompson (1967) takes a somewhat different perspective, and suggests that it is an aspect of power, or the degree to which parties can limit the options available to an organization, that qualifies them as stakeholders (although he does not use that term). While all three of these definitions are intuitively appealing, they lack adequate specificity to be easily applied in a given situation. Thus, in practice, identifying stakeholders remains currently something of an art-form that requires experience and judgment, particularly in an enterprise as complex as a USACE environmental project (Gray, 1989). There are always some candidate stakeholders that everyone would agree on, but it can be difficult to decide how far to go beyond these obvious choices.

On the one hand, one can easily overlook a key stakeholder who later turns out to be an important player in a project. The danger here is that by excluding a key stakeholder from the early phases of project formulation and planning, an alternative that the stakeholder dislikes may be selected. If such a stakeholder is sufficiently aggrieved, the project could be held up or even canceled. For example, in one USACE District there is a situation in which a highway widening project is immediately upstream from a proposed environmental restoration project, but the key agency involved (Department of Transportation, DOT) was not included at the beginning of the planning process. Although USACE intends to involve the DOT, other stakeholders desired their (DOT) early involvement to ensure the highway project will be compatible with the downstream environmental project.

On the other hand, it can also be difficult to draw the line as to who is peripheral enough to safely exclude. The danger here is that including more parties diminishes the speed with which planning can be accomplished, due to the increased logistical requirements, information sharing, and preference differences that must be accommodated. Perhaps more important, attention to the preferences and beliefs of marginal participants detracts from the attention given to the most important parties. For example, a USACE District employee made the following observation:

> *"I think our interagency meetings are too large. We bring four or five people and they bring four or five people and pretty soon you've got a 15-20 person meeting, and it is hard to control a meeting that large.....Somebody brings their supervisor or somebody who doesn't know anything about the project, and it takes 45 minutes to bring them up to where you are."*

Clearly, there can be process inefficiencies if one is too inclusive. Convening and managing large meetings can be troublesome. However, both Susskind and Cruikshank (1987) and Gray (1989) argue that in the vast majority of cases involving public matters, the logistical advantage of a smaller number of participants is usually outweighed by the problems that arise if someone feels that they have been unfairly excluded.

WHO IS A STAKEHOLDER?

The three definitions above suggest an approach that could help to narrow the set of possible candidates for inclusion as stakeholders in USACE environmental projects. A series of three simple questions can be asked and evaluated to surface potential stakeholders:

1) Who affects or is affected by this project?
2) How important is the project to them?
3) What can they do to assist or impede the project?

Answering these questions will produce a list of possibilities that can be organized into four basic types: (1) direct participants, (2) parties whose approval is required, (3) other affected parties, and (4) potential resources. Those in the first two categories will, in some sense, have a major influence on (or could even veto) a project, while the last two categories generally do not.

1. Direct Participants. These parties are directly involved in the financing, construction, operation, maintenance, or monitoring of the project. These are the most obvious choices as stakeholders, and ones who are usually hard to miss. Possibilities for this category would be the USACE District, cost-share sponsors, the owner or manager of the land on which the project is proposed, and the government or resource agency that will be responsible for operation, maintenance, and monitoring. These parties would typically be the core participants in project formulation and design. They can veto what they view as an unacceptable project.

2. Approval Required. These parties do not actively participate in operations on the ground, but must sign off on the project in some fashion. Possibilities for this category would be HQUSACE, state and local permitting agencies, U.S. Fish and Wildlife, some landowners adjacent to the project, watershed authorities, and other federal agencies such as EPA. These parties are not usually core participants in project formulation and design, although they can often make valuable contributions. They can veto what they view as an unacceptable project.

3. Affected Parties. These parties are affected by the project in some way, but do not have any formal role in it. Possibilities for this category are almost endless, but examples include local non-adjacent landowners, local recreational users of environmental resources, local and national environmental interest groups, resource agencies from neighboring jurisdictions (especially downstream), local elected officials, and the media. These parties typically would not be core participants in project formulation and design, except indirectly through informational public meetings and the like. They can become core participants if they feel that their interests are being damaged, and take legal or political action. The cooperation (or indifference) of these parties is helpful, but they cannot directly veto the project.

4. Potential Resources. These are parties who could bring a resource to the project, but are not tied to it in any direct way. This could take the form of technical knowledge or data available through an area or regional group that monitors or coordinates environmental projects. Examples of this version include the Interstate Commission on Potomac River Basin in the Washington, D.C. area, Coastal America, the Long Term Resources Monitoring stations in the Upper Mississippi River, as well as IWR and WES within USACE itself. Another form is volunteer groups who can aid in monitoring, maintenance, or even construction. Examples include the student "stream teams" that monitor water quality in the Anacostia River basin, local groups in Redmond, Washington that plant vegetation along project sites, and local environmental groups.

To illustrate the idea of these stakeholder types more specifically, consider three case studies of USACE environmental projects (Table II-1; see also the Appendix). These three projects are being conducted under different authorities and in different Districts, and thus there are some notable differences. For example, in the Pool 8 project on the Upper Mississippi there is no cost share sponsor and the landowner is U.S. Fish and Wildlife Service, since the project is on a National Wildlife Refuge. At the other end of the complexity spectrum is the Anacostia River general investigation project, which has two local cost-share sponsors, many small landowners, and multiple regional coordinating groups.

An interesting feature of these stakeholder lists is that they are not dominated by "the public," but rather are mostly resource agencies or government entities. Their representatives in project meetings are generally professionals, who in most cases will already have had contact and even long relationships with USACE. In addition, a key stakeholder (who is generally not physically present) is HQUSACE, who in most cases must eventually review the project for funding approval.

TABLE II-1

SUMMARY OF KEY STAKEHOLDERS IN CASE STUDIES

	Direct Participants	Approval Required	Affected Parties	Potential Resources
Pool 8 Islands, Phase II Upper Mississippi EMP	St. Paul District USFWS Wisconsin DNR	HQUSACE	Minnesota DNR City of Stoddard	LTRM stations Ducks Unlimited
Bear Creek 1135 Project	Seattle District City of Redmond King County	Muckleshoot Tribe Washington FW HQUSACE	Washington Dept. Trans. shopping mall developer	Redmond volunteers
Anacostia River, NW Branch General Investigation	Baltimore District Prince George's County Montgomery County	Maryland DNR Maryland Park & Planning HQUSACE	Council of Government local landowners	ICPRB student "stream teams"

III. WHY ENVIRONMENTAL PROJECTS ARE DIFFERENT

Environmental restoration projects are an increasingly important part of the USACE mission and project portfolio (see Shabman, 1993). As recently as a decade ago, many in USACE would have been surprised by such a prediction, and yet it is now an accomplished fact. This new reality is reflected in a number of important dimensions on which environmental projects differ from USACE's traditional flood control and navigation projects. For example, the very fact that they are relatively new and different leads to much uncertainty about the appropriate project planning and management procedures. Similarly, the familiar procedures for quantifying project outputs in terms of NED benefits are not easily applied. This causes a need to shift the perception of how valuation is conducted. These and other differences in turn have implications for managing stakeholder involvement in the planning process as a collaborative effort. Joint determination of the appropriate analytical procedures to be used allows all stakeholders to communicate based on a shared understanding of the information and evaluation requirements for project valuation.

What new challenges are presented by environmental projects, compared to the traditional and more familiar Flood Control and Navigation (FC/N) projects? What roles do stakeholders play in USACE environmental projects? How do these roles differ from those that they play in flood control and navigation projects? While some aspects of the traditional USACE project planning and management approach map easily onto environmental restoration projects, this type of project also differs in many significant aspects. This section explores these aspects, and in the process suggests some possible answers to these three questions.

To organize the discussion, we will focus on three categories of issues on which FC/N and environmental projects differ (summarized in Table III-1): stakeholder participation, technical and methodological issues, and internal USACE issues. Each category (and dimension within categories) is first introduced conceptually, and then is illustrated by excerpts from the case study interviews.

STAKEHOLDER PARTICIPATION

One of the key variables in determining the success of project planning and management in any context concerns the organization structure and associated division of labor (i.e., which participants are assigned to play which particular roles on the project team) (Shtub, Bard & Globerson, 1994). Several differences between FC/N and environmental projects revolve around the theme that the different roles project stakeholders play lead to less USACE autonomy in planning and implementing environmental projects. Shabman (1993) argues that "[T]he future will be one of relying on structured group negotiations, buttressed by strong technical analysis. This decision making approach may preserve many of the tools, but not the decision making powers of traditional planners" (p. 3). Therefore, a critical success factor for environmental projects will be the extent to which participants adequately adapt to any differences in roles played not only by the stakeholders, but also by USACE personnel. It is within this increased

TABLE III-1

DIFFERENCES BETWEEN ENVIRONMENTAL PROJECTS AND TRADITIONAL USACE FLOOD CONTROL/NAVIGATION PROJECTS

	Flood Control/ Navigation Projects	*Environmental Projects*
Stakeholder Participation Issues		
Technical expertise	USACE	stakeholders and USACE
System-Coordinated Project	USACE developed	stakeholders develop
Conflict potential	sometimes controversial	generally popular
Technical design	USACE	stakeholders and USACE
Stakeholder activities	attend public meetings	key decision makers
Technical and Methodological Issues		
Technical knowledge	well developed	still developing
Quantifying benefits	usually straightforward	usually difficult
Role of experimentation	an unnecessary risk	needed to advance understanding
Project risks	public safety, economic losses	environmental degradation
Environmental goals	mitigation	restoration
Internal USACE Issues		
USACE experience	extensive	limited
Typical attitude of USACE personnel	"our central mission"	"nice to do, but not essential"
Key personnel	engineer/economist	biologist/engineer/economist
Role of biologists	develop EIS	possible project manager
Guidance stability	relatively stable	rapidly changing
Planning requirements	well understood	several different authorities with differing requirements

participation that information exchange can help define project valuation parameters that are critical to addressing site and portfolio questions.

USACE is Not Always the Expert

In FC/N projects USACE is the recognized technical expert, and is appropriately deferred to in these matters. In these cases, something closer to the decide-announce-defend model is perhaps a reasonable approach. In environmental projects, however, this may not be the case. While issues of hydrology are always a key factor in environmental projects, there are many other issues (especially in biology and ecology) that are relatively new to USACE. Indeed it is sometimes the case that other stakeholders have considerably more expertise in the technical and scientific issues relevant to a particular site than does USACE. For example, many watersheds have comprehensive management plans based on large amounts of data and sophisticated analyses performed by local or regional governments or agencies.

> *There's a significant amount of data available on this basin from the sponsors. The basin plans as well as other [regional] studies have been done and have helped tremendously. [District]*

> *I think the Corps would be smart to not pretend that they are so sophisticated, that they can do all of this magic. They could really be a big help. We know they are experts in hydrology and that is their strength. [Stakeholder]*

> *The County likes to be involved. We've worked with them on many, many issues. They also like to be involved to the point that they, I don't want to say that they are in competition with the Corps, but they do, have sufficient funding sources and staff that are capable of doing a lot of the same types of things that we do. And their staff is able to work with us very closely. [District]*

> *Our river bluegills act like a different species than bluegills in lakes. And so we had to set up a Delphi group with the Corps and rewrite the model to match river bluegills, and now we use that. [Stakeholder]*

Project Proposals Often a Part of a Coordinated Effort

This new distribution of expertise leads to several other consequences. The existence of watershed or regional management plans means that stakeholders often have a ready-made list of needed environmental projects before USACE gets involved. These management plans are designed to indicate the preferred order for constructing projects based on their value to the overall system. Additionally, Feather and Capan (1995) found that most of the ten project sites they studied were

identified and originally proposed by a local agency or interest group with very specific design requirements.

> *Basically our job is to identify possible restoration projects, whatever they may be, for the locals, the state, the Corps, for everybody to then mull over and hopefully implement, and our job is to coordinate the restoration efforts that are going on throughout the Anacostia. And since the Anacostia is a multi-jurisdictional area with COG being a regional planning agency, it is a nice fit. We try to advise where we can. We have a lot of technical expertise in the area of stormwater management, stream restoration, stream ecology, et cetera. We have prepared cost-share applications for the locals to use, acquired money from the state to build things with, and completed demonstration projects where we have actually designed and built projects in the Anacostia. So we have a lot of different services that we provide to the locals, including a technical advisory-type role for the Corps. [Stakeholder]*

> *A lot of biologists down there had site-specific projects they wanted to pursue. Backwater dredging, closures, structures, culverts, or other stuff for little individual areas, and that is how the project initially got developed. [District]*

> *Actually, we have a real concern with the lower part. I mean, we have a huge investment in the upper part. We want to make sure the lower part works, especially with development occurring on both sides of the stream.*

> *And it's not just this project. There are several red blotches on that map in the lower portion that are in critical areas in which we have a big stake and want to make sure that those projects are completed and are successful. [Two Stakeholders]*

> *I think the Corps has done a pretty good job of asking everyone what would make good 1135 projects. [Stakeholder]*

Environmental Projects are Popular

There are two main reasons why environmental projects usually involve less conflict than FC/N projects. First, as mentioned above, project ideas are often part of an existing watershed management program that has received substantial impact from local stakeholders. This means that they are often "pre-sold" on a project's benefits almost before USACE is even seriously involved. Second, the top priority of an environmental project is to restore something in the environment that has been previously lost due to human activity. This is almost universally viewed as a positive event by anyone in the local area, as well as by state and local governments and resource agencies. In addition, since USACE is essentially offering to bring new money to the table for projects that are already desired, the potential for conflict is greatly diminished.

We met with the city, and they were extremely eager to pursue this project. They had done some previous work with some consultants and the County in setting up a conceptualization of what they would like to see done to improve this lower mile of creek. So it was very much a case of a need that has been identified already by the county and the city, as well as others, in their basin plans. Then when we mentioned that we had this authority, things clicked together immediately. [District]

In some ways the Corps has to keep these environmental projects because everybody likes to see them done. We have to be the ones asking if this is really going to work, does this really make sense, should we really be spending our money here? [District]

Our operations and maintenance program and our navigation program do not allow as much common purpose of the direction that we are going with environmental projects. This authorization brings the agencies together with a commonness of direction in terms of what we're trying to achieve, which you don't have with a lot of other programs. [District]

It [1135 program] was certainly a pleasant surprise, to say the least. [Stakeholder]

Well, the existing situation [at the site] is so bad that aesthetics are improved no matter what you do. I'm a positive thinker, and I think aesthetics are going to get better no matter which alternative is chosen. [Stakeholder]

One thing that's nice though is in these projects versus others, particularly flood control studies, the outside agencies and the resource agencies are going in the same direction with you [the Corps] and that's wonderful. Not being the bad guy consistently; it's rather nice. [District]

You would have to have a catastrophe to not convince people you're doing something that's bettering the conditions and therefore you are pretty much willing to pay for it so you don't have some of the agency problems that you do with a flood control study. Here, they're pretty much on your side and they may quibble a little bit...but I think the bottom line is they will be happy to get something done. [Stakeholder]

Stakeholders Participate in Technical Design

In many cases, various stakeholders often have quite a head start on USACE personnel in understanding and modeling the nature of the particular problems at a given site, as well as how they relate to other sites within the watershed. For example, in many cases, local or even regional watershed plans have already been developed by resource agencies (e.g., USFWS) or as part of an interagency federal initiative (e.g., Coastal America). In addition, because these entities often have their own in-house technical expertise (as discussed above), they have often developed models and analyses that can be used without USACE needing to re-invent them. Consequently, it may be unwise to exclude key stakeholders from the technical design of project alternatives. Recognition

of previous local technical evaluation of a watershed, as an indicator of prudent decision-making at the local level could support elements of the portfolio decision-making process at HQUSACE.

> *The blueprint was a group of projects prepared by the Council of Governments that they had outlined. These are the types of projects we need, these are the costs. We looked at it as a type of preliminary reconnaissance level attempt at 460 projects or so. [District]*

> *....because it is on a national wildlife refuge, we are going to be charged with doing the O&M. We definitely want to get our say into what is constructed because, as we are finding, operations and maintenance is becoming a very costly item on these projects. [Stakeholder]*

> *One county would like us to use TR20 modeling and the other wants us to help develop their HSPF-GIS water protection system. They are two different approaches. [District]*

> *Methods we use to evaluate and prioritize, and the GIS we are developing with the county....they have done some of the work for us. [District]*

> *What's happening is this ecosystem approach to restoration. It's quite a concept, hard to grasp. To do an ecosystem evaluation there are many things you need to look at. Some you are not going to be able to look at because of the objectives you set. We're trying to find the most effective, efficient way to do that. [Stakeholder]*

Stakeholders are Key Decision Makers

All of these changes shift the potential role of stakeholders from being targets of USACE communication and persuasion to being central participants in the planning and decision making of a project. What constitutes a good project (and which outputs should be used to describe it) depends heavily on what is acceptable to the stakeholders, and not just how it measures up against a technical standard (e.g., positive net NED). Therefore, stakeholders must be involved throughout the process, not only after the valuation is done. In light of this enhanced involvement of selected non-USACE stakeholders, attention must be given to the added valuation challenges of communicating analytical procedures to HQUSACE for portfolio considerations.

> *They [USFWS] have a large voice because it's on their refuge and they give us refuge compatibility statements. They are an equal partner in this with us, and the state where the project is located also essentially has a veto. [District]*

> *We're not going to develop two alternatives that each county likes. We're going to work with them. They're a team member. When we put the alternatives together, we put something together that everyone likes. [District]*

The Corps, the states, and the Fish and Wildlife Service [at the River Resources Forum] came up with this phasing scheme on the fact sheet....The Resources Forum and a subgroup of that called the Fish and Wildlife Workgroup, which is made up of biologists that work on the river, prioritize proposed projects. [District]

They [stakeholders] are the people that have invested a lot of their personal time and interest in this, and they are really good people. It's wonderful having them because they really do know what they are doing and they want to make sure their ideas get in. [District]

TECHNICAL AND METHODOLOGICAL ISSUES

The methods and goals of environmental projects also differ from those in flood control and navigation projects. The underlying source of many of these differences concerns the state of the scientific and technical knowledge that is available to guide the design and implementation of various project elements. This uncertainty is a part of what defines the shift in valuation procedures for environmental projects and, at times, can create conflict in determining the appropriate values.

Environmental Science Has More Uncertainty

While the water systems engineering and hydrology areas are relatively well understood, many areas of ecological science are in their infancy. Local ecosystems are highly complex, interdependent, and dynamic systems for which there are currently only limited models available. The best developed of these classes of models are probably those that focus on a single species, such as the Habitat Evaluation Procedure (HEP) models developed by USFWS. However, even these models address only a small part of the ecosystem at a time, and even then have only a modest degree of predictive validity. Because of the early stage of development of ecosystem models, there is much more uncertainty about the likely outcomes of an environmental project than in a FC/N project.

It's an evolving field. I mean, we have people within the field that disagree on different approaches. [District]

We build the project, we can go out and measure the dissolved oxygen, the current velocities, the temperature, the bathymetry, we know what the water depths are. Those will be easy. We will know within two years if we achieved what we needed. For aquatic vegetation and cover, it may take ten years. Nobody really knows how long it will take to recover. [District]

Flood control has been around for a long time. Everything is tried and true, we know how to do it, and there is no argument. We're the leaders; we know how to do it, and we've done it for years. We can dam any river, we can stop any flood. In environmental restoration, there is a whole range of issues you need to address regarding how the project should be completed. [District]

Benefits are Difficult to Quantify

One important consequence of early state of knowledge is that the socioeconomic benefits can be difficult to assess. Not only is there considerable uncertainty about the exact outcomes of a project, but the state of knowledge in the discipline of resource economics, one of whose objectives is to model the human value of ecosystems, is also very uneven. Some methods are relatively well-understood (e.g., those related to market-based businesses and recreation), but others are wide open at this time (e.g., valuing biodiversity, existence values, aesthetic values) (see Shabman, 1993). Unfortunately, most of the benefits of environmental projects fall in this latter category, especially given the explicit de-emphasis on recreation and economic outputs required by many of the authorities under which environmental projects are conducted. Needless to say, the lack of an agreed upon method for quantifying benefits complicates several aspects of planning, but especially incremental cost analysis, and other types of cost-benefit assessments. This problem can be partially addressed by quantifying some outputs (e.g., habitat units), but the existing models do not do a good job of characterizing the impact on the ecosystem as a whole (Shabman, 1993). This also creates difficulties in communicating project benefits to others outside the project team (e.g., HQUSACE).

I don't think that we could quantify the benefits and show that it is incrementally justifiable from a habitat perspective using any of the HEP models we have now. We don't have a model that is sensitive enough to do that, and there's not one that has been developed. [District]

Well, there are some things that we can measure, such as flood storage capacity. Certainly we could do a survey of the fisheries. I'm certainly not an expert in that but I think those are things that are measurable. Some of the intangible stuff would be the character of the stream. How does it feel? How does it look? How does it become part of the community that it wasn't before? How is the city better for it after this is done? It's not going to be something we can measure but it certainly will add something to the way the city feels. Again, that's such an important part of this community. We don't have the Puget Sound, we don't have the view of the Olympics, we don't have Lake Washington. Where we are attached to the lake, we're not looking at it. What we have is a river and a creek that's been channelized, and anything that we can do to make those, I want to say, more livable, is important. They have a certain character now, but we want to make them more part of the community. [Stakeholder]

The people at Vicksburg are great as far as defining how to reconfigure the channel in areas that have problems, and those types of things. But when it comes to setting the way you define the benefits of a project, I'm not sure that the Corps is heading the right way. You see, they want something that they can use nationwide and use everywhere. But when you're doing environmental restoration, Oregon is different than Maryland. California is different than Maine. And they have got to realize that. [Stakeholder]

We want the Corps to take less time in going from conception to putting it in the ground. We don't want to get hung up in a bunch of crazy ways of justifying projects. We simply want to justify them based on their perceived benefit in the watershed. In terms of the people in the watershed, we'd understand. You can say, we're going to create a very diverse warm-water fishery from the trash fishery you have now. That is the kind of thing we want to talk to the public about. And that is how we would like to see the Corps think about it. We are going to stop the sedimentation that is caused by all the channel erosion, and it is caused by not controlling the runoff. We are going to let the fish have a more natural run of the stream by getting rid of all the road crossings, redesigning and getting them rebuilt so that the fish can get through them. [Stakeholder]

The Corps was using methods that really didn't work very well for level, urban streams. They had to show wetlands restoration, and quantify it, and we had to quantify habitat units somehow to show the benefits of this project. Well, this is all baloney to us. To us, the way to talk of benefits is in terms of how many feet or miles of stream have been restored to a condition that supports a reasonable diversity of aquatic life that should have been there in that stream if it wasn't messed up. And the Corps would not talk to us in those terms because they don't have formulas to deal on those terms. There was something out of Vicksburg, they had this really complicated HEP methodology, and you could argue totally useless quantitative data. [Stakeholder]

Value of Experimentation

The concept of adaptive management (Shabman, 1993) was developed in part to address the project planning and management realities that result from the uncertainty that surrounds the science underlying environmental projects. This approach involves a shift in perspective from planning as future control by current actions to planning as incremental decision making. In this latter view, one of the objectives of each environmental project is to advance our understanding of ecosystem functioning (that is, from this viewpoint every project is thought of as an experiment).

The philosophic roots of the adaptive management idea are old and deep. In their classic analysis of organizations, March and Simon (1958) distinguished between coordination by plan and coordination by feedback. They argued that the more uncertain the situation, the greater should be

the reliance on coordination by feedback (i.e., try something --> find out how it works --> adjust accordingly --> try again) rather than by "ex ante" planning. Adaptive management is a conceptual descendent of coordination by feedback which, given the greater than usual level of uncertainty in environmental projects, seems a prudent course to follow. Many stakeholders seem to recognize this fact (although those who did were mostly trained as biologists).

> *Those are some of the experimental things that are going on here, which is good. Each project builds on the knowledge of the last project as well as the monitoring that has been going on. [Stakeholder]*

> *In some ways, when we deal with the Corps, a few technical people, come down pretty hard on designs and what material we can use, basically because of the types of projects they have always been involved in. When you are doing something like this [environmental restoration], I think we should be looking at more experimental ways to do it. It really isn't like an island fails because we tried an experimental technique. I mean, we didn't break a dam and flood a city. I think what we always get from an engineering standpoint is nothing experimental from a biological standpoint. [Stakeholder]*

Project Risks

The idea of deliberate experimentation in a FC/N project rightly sends chills down the spines of many USACE personnel. Lives could be lost and other significant economic and social consequences could occur if an "experiment" went wrong. However, in an ecosystem restoration, no one will die if a stream's new meander does not work out quite the way it was drawn up, and you may have a chance to modify the project to try again in the same site. Indeed, adaptive management assumes these conditions -- take relatively modest steps with frequent feedback and course corrections. Further, in environmental projects, often the greatest risk is the additional environmental degradation that can occur if a project is delayed and nothing is done in the near term (e.g., if too much soil is washed away to allow replanting or if a species goes extinct). In some sense, it may be much preferred to just do <u>something</u> good rather than to find the optimal alternative (which probably cannot be definitively identified anyway).

One USACE institutional reality that does not readily facilitate taking greater risks in the design of environmental projects is that operations and maintenance responsibilities typically reside with the local sponsor. Many local agencies do not have sufficient resources to allocate for adaptive management practices, especially given the recognition that many environmental projects, in most cases, are small in size but spread out over a significant geographic region.

Weick (1979) discusses the value of action in situations with much uncertainty, where by acting you engage the environment you face and are therefore able to learn from the feedback generated by the experience. He argues that a bold approach to a strategic situation allows you to learn things that in turn change the options available in the next decision, thereby *enacting* part of

the environment to which you subsequently respond. In contrast, by inaction, you learn markedly less. Thus, based on the work of March, Simon, Weick, and many researchers in between, "just do something" has a sound theoretical basis, especially in novel situations characterized by higher than usual uncertainty.

> *There's the one thing our engineers have a problem with, the risk factors associated with this type of engineering. If the meander doesn't quite work the way it was designed, 200 people don't die in the next flood. It's not like a dam failure, but they tend to keep that heightened level of engineering requirement for environmental projects. [District]*

> *I guess that earlier I said there can't be a failure, but we can. The failure would be that the project is abandoned. That would be a major failure. [Stakeholder]*

Restoration Versus Mitigation

The environmental goals for restoration and mitigation activities are quite different from one another. In FC/N projects, the job of the biologist is to repair or limit the immediate environmental effects of the project (i.e., mitigation), but these goals are clearly subordinate to the primary FC/N purpose. In contrast, restoration projects are specifically intended to improve environmental functioning over the current state, and the traditional objectives of FC/N projects play little or no role. Indeed, for some program authorities (e.g., 1135) even recreation benefits can play only a very limited role in the justification for a project. Further, in FC/N projects, hydrologic predictability is highly important, whereas in an environmental project hydrologic change and variability may even be desirable.

> *The biology drives it [project planning] versus the other way where you're trying to clean up after the engineer, in a normal Corps project. [District]*

INTERNAL USACE ISSUES

When District personnel are considering an environmental project, they must adapt to a different set of internal USACE realities as well. Because environmental restoration projects are relatively new to USACE (compared to FC/N projects), conducting project planning and implementation by following "the usual procedures" is sometimes inappropriate. Many aspects of how FC/N projects are planned and implemented are deeply embedded within the culture (e.g., the aversion to experimentation mentioned above), and USACE personnel may not even be aware that they hold certain beliefs and assumptions that may not apply to environmental projects. Consequently, there are many opportunities for confusion, miscommunication, and false starts between USACE personnel when attempting to follow procedures in the planning process for environmental projects. One of the key strategies to efficient planning is understanding what

information is needed for meeting the decision-making needs throughout USACE hierarchy (e.g., site and portfolio issues).

USACE has Limited Experience in Environmental Restoration Projects

An obvious difference is that USACE has a deep reservoir of experience, examples, and accumulated wisdom to draw on in planning FC/N projects. In contrast, some Districts have yet to fully complete even a single environmental restoration.

> *We just need more experience with this type of work. [District]*

> *Let me tell you about one of my great fears, and I'm sure that you'll run into this at other places. We've had this relationship with the Corps that is about five years old. But we have yet to build anything. And we are very concerned about how that relationship will be when we reach construction phase. Because it is such a big project that we have undertaken with the Corps, we have never done anything before where we have built more than 2 or 3 projects over a period of time. And we've always had the ability to terminate the contract without losing everything. But as I understand the agreements that we signed with the Corps, once construction starts, if we're not happy we can stop the project, but we'll lose the money. And, we don't have nearly as much control as we do when we build the projects. Our concern is that we don't know how sensitive the Corps will be to do the kind of things that we have to deal with when we do a project. You can't fire the Corps of Engineers, you know. [Stakeholder]*

Culture Differences Within USACE District Offices

The greater technical and scientific uncertainty in environmental projects is compounded by an organization that lacks procedural and administrative experience in planning and implementing them. This can create difficulties in communication across functions within a District where, for example, the engineers doing the hydrologic modeling are accustomed to a much higher level of detail and resources to use in their efforts. This basic communication difficulty is made worse by an attitude among some USACE personnel that environmental projects are not the central mission of USACE, and therefore should have lower priority. While perhaps understandable, this perspective does nothing to help clear the administrative fog that can result from miscommunication and misunderstanding.

> *Part of it is a cultural thing, and there are so many people here used to building large structures. With traditional projects, you know exactly how it is going to function, exactly why you are doing it, and you overbuild it five times. And, to a lot*

of those people it doesn't make sense why we are doing any of this environmental restoration. It's not seen as a role for the Corps of Engineers. [District]

These people in the ERS I work with are very proactive but they're the only ones in the building that are proactive. I mean, they call people ahead of time and say, "We're thinking about this or about that, what do you think?" With regulatory or planning, you get things in the mail and it says you have a month to review it and then it's going to happen. So it's still the majority view of how things work. Well, I would make ERS huge and reduce the rest of it, let it atrophy away. I think there's a lot of internal problems ERS has with the rest of the Corps. I'm in a lot of meetings with both someone from ERS and someone from planning or regulatory and there's often big, ugly fights between them. [Stakeholder]

We've all got to convince ourselves that we are doing something good and that it makes sense, and then get on the engineering side, hydrology, the real estate side, that's the toughest part. When you want something for restoring some part of the ecosystem, how do you communicate that between the biologists and the engineers? And a lot of the time, especially for these recon studies, they are so limited in money that you end up sending out a copy of somebody else's plan to our cost engineering branch and asking for an estimate. So they have no idea where we're coming from and what level. They don't know much about it so they can't say, well, do you really need this here? Why did you put this here? there's no talk. [District]

Yeah, within the Corps hierarchy, I would say 1135s are not yet given much importance. I mean, people are moving toward restoration but definitely the big flood control projects, are what our hierarchy believes is most important. [District]

Key Personnel/Role of Biologists

A second type of "culture clash" that can arise in environmental projects concerns the more prominent role that biologists play. In FC/N projects, the role of the biologist is to develop the Environmental Impact Statement (EIS), which is reactive to project alternative developed by engineers and economists. In an environmental project, however, the biologist plays a much more proactive role, being central to the technical design of the project, and may even be the study manager. This ties into the possible communication problems cited above.

The biologists/ecologists, or whatever that are working for the Corps, are fairly new hires I believe. The engineers, the old school part of the Corps, have been in there for a long time. They are deeply entrenched and usually have a higher level of authority. I think a lot of the ecologists have a hard time meeting on par with the engineer types. Some of the projects in the basin, for instance, we sort of saw as smaller scale, less structural. However, when the ideas are introduced from the biologists/ecologists to the engineer types they suddenly become these large-scale

structural fixes. And I think it is just a mind-set change. When negotiations between the biologists/ecologists and the engineer types occur there doesn't seem to be a level playing field. They need to somehow either elevate the ecologists/biologists, even some hydrologists that are looking at it from an environmental standpoint, versus getting everything out of the watershed as fast as they can type out of the hydrologist. Get them to a more even playing field, and at the same time, from what I have seen, the types of procedures that the biologists/ecologist/hydrologists are made to follow are very archaic and are more related to huge scale structural things that would go in. In other words, ecologists/biologists want to put in a fringe wetland along the river and all of a sudden they are in this large scale demonstration of feed costs, effectiveness, and all of this stuff. Some of it is useful, it just needs to be toned down a little bit for the environmental projects. Maybe a separate procedures manual should be created for the environmental projects. [Stakeholder]

What it comes down to is the biologists try to convince engineers that sometimes, and I'm not just talking Corps of Engineers but the actual engineers, this would be good to at least try it or it turns into an engineering nightmare. For instance, it is easier to construct a straight line than it is to transfer and construct a lot of curves and changes in elevation. The benefits are so much greater biologically. [Stakeholder]

The technical project managers....take it to a group and say alright, this is what we have. The value engineers then look at it for ways to cut corners or costs on the construction. In some cases, you will end up getting major compromises on the environmental side because they are trying to reduce construction costs, and the biologists say no, I can't do that because you are taking out some of our objectives. [Stakeholder]

They [Corps personnel] are working on a multitude of projects all at once. That is pretty good as far as work load and job security for the Corps. But at the same time it's easier to pull them off of one project if they are not solely devoted to it....pulling of a hydraulic engineer for six months may be viewed as the removal of one person. But if you are at the stage where that engineer is needed on a big river project, you have basically frozen the project. [Stakeholder]

Guidance Stability/Planning Requirements

Another important factor that creates uncertainty about criteria and planning procedures and therefore increases the amount of required information processing, is the stability of project guidance. The planning requirements and guidance for FC/N projects are perceived by District personnel to be relatively stable and well understood. In contrast, the planning guidance for environmental projects is relatively new, and is perceived to be more complex and rapidly changing. Confusion exists as to what should be monetized or quantified to support reporting requirements for site and portfolio decisions. There are also several different authorities for environmental projects,

all of them comparatively recent, and each with somewhat different criteria, planning requirements and restrictions. Further, because they are so new, guidance is updated frequently and can be difficult to keep up on. We found few District personnel in our study that seemed to fully grasp the new guidance as it was later explained to us by HQUSACE personnel.

> *There has to be a close connection to the existing projects, and the problem we're having is the projects that the sponsors want us to do aren't always on project land. There are so many identified outside of project land that have no connection. [District]*

> *The area was directly impacted by the Corps project which according to 1135 regulations it has to be linked to a Corps project area...so that the ditch comes back to the adjacency issue .... And I guess you guys don't have that on the other projects . . . but it's like a limiting factor for the 1135 program because sometimes rather than looking at the 20 segments of stream to see which one has the biggest problem and where you could go the most good, you're limited by the authority. [District]*

> *With flood control, which is mostly what I work on, you know what the approval process is and you know pretty standardly what the problem areas are going to be and what you need to do to get approval. Here we're really in the dark. [District]*

ENVIRONMENTAL VS. TRADITIONAL PROJECTS: SUMMARY

There are many differences between environmental restoration projects and the traditional flood control and navigation projects. Therefore, USACE should not assume that the same planning process and approach to stakeholder communication can be applied without significant modification. Such an oversimplification can lead to significant inefficiencies in the planning process, and ultimately to suboptimal project outcomes. Rather, in some important respects a fundamentally different perspective is needed. Stakeholders are generally supportive of environmental projects and may be able to offer significant technical support. This new perspective must embrace rather than resist the new role of stakeholders and biologists, and thereby create new opportunities to improve planning efficiency and project effectiveness for both site and portfolio considerations.

IV. COMMUNICATION IN ENVIRONMENTAL PROJECTS

Given the differences between environmental and FC/N projects described in Section 3, what are the communication challenges faced by environmental project teams? Clearly, with the more central roles played by stakeholders, good communication takes on increased significance. The importance of good communication is further heightened by the lack of a clear valuation method, since the benefits of environmental projects are difficult to quantify using current available methods. This quantification challenge further complicates the selection of what valuation approaches will be used and how that information will be communicated throughout the USACE hierarchy.

Many of the dimensions on which environmental and FC/N projects were shown to differ in Section 3 cause significant amounts of uncertainty for members of environmental project teams. Uncertainty can be defined as the difference between the information required to perform a task and the information already possessed by the organization (Galbraith, 1977). One major contributor to this uncertainty is the still developing state of environmental science. Another major contributor is highlighted by Galbraith, who states that "the amount of uncertainty is a function of the organization's prior experience with the service, product, type of client or customer, or the technology used in its operations." As argued in Section 3, in the case of environmental projects, USACE has limited experience with both the type of project and some aspects of the required science and technology. March and Simon (1958) observed that the heaviest communication burdens in an organization are caused by the less structured aspects of its task, particularly by activities directed toward the explanation of problems that are not yet well defined. From our interviews, it is clear that environmental projects are regarded as less structured and less well defined than FC/N projects. Thus, the increased uncertainty and associated communication requirements present in environmental projects are a predictable consequence of the nature of the task and USACE's experience with it.

This Section explores three key domains of communication in USACE environmental projects: (1) communication between District personnel and local stakeholders, (2) communication between functions within a District, and (3) communication between Districts and HQUSACE. Each domain is first introduced conceptually, and then is illustrated by excerpts from our case study interviews.

COMMUNICATION BETWEEN DISTRICTS AND LOCAL STAKEHOLDERS

A major focus of this project is identifying successful approaches for communicating the benefits of environmental projects to stakeholders. Based in part on previous experiences with stakeholders in FC/N projects, many in USACE have an expectation that widely differing goals and perspectives among stakeholders will lead to conflict and other problems in the planning process for environmental projects. Furthermore, these difficulties could be amplified if stakeholders are more

deeply involved in the technical design of projects. Thus, there seems to be a need for effective communication methods to avoid or minimize these potential problems.

The reality of stakeholder involvement in environmental project planning appears to be a much more positive, and even enjoyable experience for USACE. The fact that both USACE and most stakeholders have the same basic goal in environmental projects creates a different and more conducive atmosphere for collaboration. The ease of collaboration and consequent increase in frequency of contact between USACE and key stakeholders makes it possible to clear up many potential communication issues before they become problems. In this subsection we will discuss several themes that illustrate how easier and earlier involvement of stakeholders facilitates communication about many project dimensions, including the value of project outputs.

Stakeholders Want to See Environmental Projects

Since everyone is usually in agreement that an environmental project would be a good thing, there is an emphasis on making sure that *something* actually gets done. There is in some sense less conflict over exactly what, since getting anything is much better than nothing.

> *I think it has been good, to start off, I think it has been a good partnership. I am very pleased to see the Corps move in the direction that it is moving. I believe that as a far as the big federal entities, they are the ones that are in the best position to be implementing a lot of the large scale water restoration projects in the country and if we can build bridges and build ports and other things, we can certainly work on those large restoration projects. [Stakeholder]*

> *I have to say between the Corps, the Fish and Wildlife Service, and the DNR, I have seen a lot of cooperation or at least what looked like that from my perspective. It is good to see they are not fighting against each other, working for a common cause, which I thought was good. [District]*

> *It's kind of a character thing for that, everybody in the city knows that this is a problem and everybody wants to fix it. I think that if we talk to anybody out on the street whether or not people would want to fix the stream capacity or the problems with the creek, I think anyone would say yes. It's important to the people. [Stakeholder]*

> *If it's successful we would, I think, generate a lot of support for other restoration projects. I'm not sure who that group is....the council, you know, political forces....give the press something to write about. [Stakeholder]*

Early and Frequent Contact With Stakeholders Improves Communication

By communicating frequently and a little bit at a time, misunderstandings and conflicts are often resolved before they ever develop into problems. In many cases, it may be just as easy for the planner or engineer to make a design choice in a way consistent with stakeholder desires as it would have been to do it the "usual" way. However, the design parameters and priorities of the stakeholders must be surfaced early enough in the process to identify appropriate valuation procedures for satisfying their reporting needs. This early involvement lays the initial foundation for better communication and interaction among all parties involved.

Communication has been really good. I don't have any complaint there. You know, we faxed things back and forth, even minutes of meetings to verify if the information is correct as to what was said. So the communication's been excellent. [Stakeholder]

I think the Corps is doing a good job. They are doing a good job of getting the information. They take what is talked about at these meetings and the next meeting you get your answers, sometimes sooner than that. [Stakeholder]

Well, the Corps seems to make the final decisions about what's in that document and then they send it out. They're very good about sending it out for review and comments and I think they have accepted all our comments. If they didn't understand our comments or felt there was a problem then we discussed it. [Stakeholder]

No, this was the South Florida Project, the South Florida Reconnaissance Study. They interviewed something like 1,000, maybe 2,000 people, having something like seven or eight workshops. The bottom line is when they finished that study, they had common consensus on what people wanted. They were able to boil everything down under 10 main topic issues. And they were able to provide those back to the people and granted, they didn't please everybody, that's impossible to do. But they had a pretty good consensus for the majority of people by the approach they took. It was very painstaking. It took nine months to do it but it was well worth what they got because now they have a lot of public support to go into the feasibility study....What I was saying, is if it worked at that level, it could work at our level. That's what I'm saying, if they can do it, we can use the same procedure and it should work for us. [District]

This is how we get their involvement. We don't come up with a plan by ourselves. We have a very extensive public involvement program. We get them involved when we are out identifying the problems. We go out and do research and define who the public is and say, what do you find are problems? They give us some direction, and we take those, we further investigate those. We come back to them and say, based upon what you told us and what we found out, here are the problems. How can we solve these problems? They give us solutions. We go back. We look at other solutions, we pull it all together, we come to them and say, you told us what the

problems were, this is what it was. You gave us solutions, we also came up with others, here are solutions to meet the problems, what do you think? They give us input again. And then we apply that to our study. This is public as well as governmental agencies. So they are involved. It's just that they don't have the final say in what project actually gets selected, but we have their input so when we select a project it should be what a majority of the people agree on. [District]

And I think when we were coming up with the goal, we were sitting in the room, writing on the chalkboard with the sponsors there and everybody providing input. [District]

There are two major studies that had been going on in the basin where we had been working closely with the county and the Indian tribe and the State Department of Fish and Wildlife, etc. so we were pretty well aware of a lot of concerns there and then when people came up with ideas. It was like, Oh! We could do a restoration project, then we were already in with this group of people that had good ideas about what to do....So I was meeting monthly with those people on the Cedar, so those contacts were being strengthened. [District]

Comparing Stakeholder Timelines as a Communication Tool

A very effective technique for facilitating useful communication is to explicitly discuss the schedules, expectations, and timelines of various stakeholders. Most stakeholders are professionals who are representing an organization such as a resource agency or local government. So, like USACE they too have budget cycles, approval processes, contracting and permitting issues, and other conditions that must be accommodated. By explicitly laying out the key milestones and approvals for project planning and implementation, many key issues and mutual misperceptions can surface and be discussed. Examples of this type of discussion can be found in the Appendix. While it is sometimes perceived that the USACE process is long and drawn out, in at least one of our case studies (an 1135 project) it turned out that the local stakeholders actually could not move any faster than USACE. By identifying and incorporating the constraints imposed by the structure and processes of each of the stakeholder organizations, many unnecessary conflicts due to misunderstandings can be avoided, thereby directing attention toward the truly key issues on the critical path of the project.

Well, I'd say efficient planning. Fund a lot of these things so that people know that they don't take forever because the perception with anything you do in the Corps is glacial. There aren't enough things out there that show it's even possible. [Stakeholder]

But I think an advantage of the [1135] project is that it is a short time frame so that you can actually get something done quickly, and you don't have long planning studies like the Corps typically does. [District]

You know, we could take a project through design and construction in 3 years. On the outside, we could do it quicker if we had to. The Corps needs to figure out ways of not making it so bureaucratic. [Stakeholder]

Say we determine the flow through a rock weir should be 100 CFS and they design something that is one hundred feet and we learn two years later that it should have been fifty. To correct it requires two dump truck loads of rock and an act of Congress. [Stakeholder]

Visible Progress as Communication

In many cases stakeholders other than USACE are more directly accountable to the local public. Consequently, even though the local public may not need to explicitly approve a project, their perceptions can be an influence. Because the public (and the press) generally have only limited technical knowledge, visible progress at the project site becomes an important form of communication (particularly if a project is close to a municipality). While talk of technical criteria, such as habitat units, may be frustrating to local citizens, moving dirt or cleaning up debris or trash can be easily seen and understood. Since most projects take at least a few years to take from inception to completion, building in early visible progress (even if it is somewhat superficial) can help enhance the perception of benefits.

....the community really appreciates what we did. I mean, now the stream looks like a nice place to be. Before it looked like a trashed stream. And there was trash. There were gigantic water heaters and everything else laying in there. We cleaned all that out, and it is not there anymore. They are not using it as a dumping ground. See, somehow the Corps needs to think of how to deal with us and the public in those terms, and not this scientific razzmatazz from Vicksburg. Because, no matter how useful or accurate that is you can't convey it to the public. [Stakeholder]

[W]hen we go out on a public meeting and explain to our citizens that we want to do this one, we want to build this certain project and here is what the benefits are, if we tell them that it is worth five habitat units, they are going to look at us like we are nuts. [Stakeholder]

You know, they don't understand that, but they do understand that there will be more fish in the stream, that there will be a more diverse fish community. [Stakeholder]

Bulldozers moving on the ground to them (the public) are good. [Stakeholder]

....and there's a regional trail that goes by on the other side. You look across and you see this famous stream coming out that's got tires and riprap....but you see also on the banks tires and riprap to stabilize it. Anyone that knows anything about natural systems starts thinking, "Boy that's not what I expected to see." The regional trail connects a park that goes all the way through three towns and goes around the university. It's a very significant region. [Stakeholder]

COMMUNICATION BETWEEN FUNCTIONS WITHIN DISTRICTS

Another set of communication challenges arises from the division of labor within Districts. These mostly relate to the potential difficulty of adjusting beliefs and expectations from those of the familiar flood control and navigation mind set to those of the world of environmental projects. Many of these differences were discussed in Section 3. For example, reconnaissance and feasibility studies in environmental projects often do not require the same depth of technical analysis, small failure tolerances, etc. that are required for many FC/N projects. Since many people who contribute to the analysis (e.g., hydrologic modeling, legal or regulatory analysis) may not be on the project team, these individuals may have less familiarity with environmental projects in general and this project in particular. This can easily lead to misunderstandings, delays, and false starts.

The Corps internally, even within the district much less the Corps in general, hasn't done a lot of environmental projects and it'll be interesting to see how much support cooperation we get from other technical offices as well as the reviewers for doing this kind of work. I mean, this is so different than a flood study. You know, real estate, hydraulics, and some of the technical people are going to have to be real open minded about different requirements. Take the risk factor for hydraulics, if you misdesign this, you know, it certainly isn't as great as a dam failing and drowning out a town or something. The level of detail is different and the risk factors are different. They need to be able to go with that and not require highly rigid levels of detail and expertise for poor little one year studies. It'll be interesting to see just how much support we get for that. [District]

It's a negative because there's more people that are unsure of the process and what happens each step of the way. Where we are with the flood control project, I know what the biologist is doing, and I know if I need information from the biologist or what kind of information I'm going to get from the cost engineers. And these studies, they just require a lot more interaction between the team members which is a positive if your people can do that....It takes everybody working together more. [District]

We lack the expertise and experience within our own engineering group, even within our group, just trying to deal with the uncertainties. Our study team wants to do site visits but we have no specific site in mind. We have potential sites in mind, but how do you do a cost estimate first? They're used to going out at these flood control projects. They see the same site, this is the study area, this is where you are going to build your project, do an estimate. And they've done these things hundreds of times. We're telling them, this is your watershed, we're going to pick a few sites, wherever it makes sense, and we're going to build, maybe we'll do seven stormwater management ponds. Maybe, assume four stream restoration projects. What size are they? Well, a few acres for stormwater management ponds, just come up with a best guess, and they don't like that. [District]

COMMUNICATION BETWEEN DISTRICTS AND HEADQUARTERS

An important communication challenge concerns the extent to which Districts and HQUSACE share the same view of various aspects of environmental projects. Key structural features of the situation that contribute to this condition include: (1) by design, Districts and HQUSACE have somewhat different goals, (2) they are separated physically, (3) environmental projects are relatively new to USACE, and (4) environmental projects have greater scientific and technical uncertainty.

First, Districts and HQUSACE play different roles in project planning. Districts are concerned with prioritizing potential projects within their own geographical area of responsibility (the "local" portfolio question) and with project planning and implementation at the selected sites (site question). HQUSACE, on the other hand, must prioritize projects across Districts throughout the country (the "national" portfolio question). Decision makers who have different goals such as these often attend to and emphasize different problem dimensions, even if they are looking at the exact same situation (Dearborn & Simon, 1958). Thus, the fact that Districts and HQUSACE have different goals naturally leads to potential communication difficulties.

Second, the fact that Districts and HQUSACE are physically (and organizationally) separated adds to the communications challenge. While local stakeholders reap the benefits of increased project understanding and acceptance through their direct participation in the planning process, HQUSACE does not have the same opportunity. When Districts and local stakeholders are prioritizing projects or trying to understand the potential benefits of a project at a given site, it is comparatively easy for decision makers to gain familiarity with the candidate sites, sometimes due to months or even years of prior experience (using what Huber & Daft (1987) refer to as a "rich" communications medium). In contrast, HQUSACE reviewers must rely on written descriptions and technical analyses to gain an understanding of a project site which they have probably never seen (a "lean" communications medium). Further, because of their duty to evaluate projects across Districts, they also must find criteria that can be compared across projects in diverse regions of the country. Although project managers in part represent the interests of HQUSACE at stakeholder

meetings, they also have many other priorities, making them a limited substitute for direct participation of HQUSACE personnel.

The third and fourth points suggest that this lack of direct HQUSACE participation is not easily remedied through the traditional hierarchical USACE communication channels. As discussed in the introduction to this Section, these two points lead to an increase in task uncertainty. Galbraith (1977) observes that "an increase in task uncertainty overloads these [hierarchical] communication channels and introduces delays and distortions." (p 43). In this case, the newer environmental projects have much more task uncertainty than traditional projects, and it is the hierarchical communication channels between the Districts and HQUSACE that are overloaded. The delays and distortions come in various forms, such as reconnaissance and feasibility studies that do not provide HQUSACE with the information they need, Districts who find it difficult to communicate the value of projects to HQUSACE, and, in some cases, projects that simply are not tried because District personnel perceive too much uncertainty about project schedules and approval probabilities. Feather and Capan (1995) made a similar observation in their review of ten USACE environmental projects: "The greatest challenge faced by planners, with regard to environmental significance, was successfully conveying it to reviewers at higher levels [within USACE]" (p. 12).

In case study interviews for this research, District personnel and stakeholders often expressed considerable uncertainty about the criteria for project approval and the timing of project funding. This uncertainty, which is common to most USACE projects, often plays a significant role in discussions with stakeholders during the planning process and could, in some cases, lead to dysfunctional behaviors. For example, in conversations with personnel from various Districts around the country (not necessarily those in the case studies), their opinions indicated they feel it is necessary to over-analyze (relative to the resources available) early in the process, consider game-playing with benefits and models, or even decide, given the uncertainty and their own limited time, that it is just not worth submitting a proposal for a particular environmental project at all. Stakeholders will naturally pick up on these attitudes and interpret USACE as somewhat bureaucratic and capricious. These perceptions clearly do not improve communication with stakeholders, especially when consensus needs to be reached regarding the selection of valuation criteria/techniques.

> *I'm worried about the process. The local stakeholders don't know if the funds will ever be available until we finally see them, so I'm worried that we'll lose other opportunities for funding while we're going through this process. In the end this may die and we're nowhere except being two years behind time. I wish we could have some guarantees up front that this thing will be funded. [Stakeholder]*

> *We did another project on an 1135 program last year and according to the project manager you never really know if the project's going to be funded until finally you see the dollars, so it leaves us feeling that at any point they could cut the funding off. You've gone down the road a year and a half or two, and all of a sudden you're back where you started. [Stakeholder]*

Because a lot of the problems on these 1135s is not, to me, it's not so much dealing with the other agencies because our ERS people have a good working relationship with technical people from the other sponsors or other agencies. It's within the Corps because these are new projects. We don't quite know what HQUSACE wants to see. [District]

There's sort of an unknown approval criteria for us when we're submitting paperwork. We don't know if it's going to get approved. [District]

This seems to face a lot more uncertainties about getting funding, in our system. If it's approved for the CIP for the year, the money's there, and you start working then. This one has this cost versus output analysis. We don't usually do that. We don't know how, we haven't hired any economists, and it seems like, the objectives and outputs are less clear this time than if we're building a trunk drain. You measure so many mathematical models, so much bulk, stick a pipe down the creek and go. I think the objectives are less clear when you're working on habitat restoration as opposed to building a trunk drain. [Stakeholder]

On the other hand, our interviews with HQUSACE personnel suggest a somewhat different view. Many there express some of the same concerns about the planning process for environmental projects as did District personnel (e.g., a lack of familiarity with various elements because environmental projects are fairly new; inadequate communication channels to Districts; sympathy for some further delegation of approval authority). However, they often express frustration with proposals from the Districts that they perceive as reflecting inadequate attention to what the guidance actually requires, or fails to take advantage of flexibility that existing guidance already provides. They also feel Districts could do a better job of keeping up with guidance updates. A particular concern is proposals often provide information they do not need (or want), but fail to provide fairly simple information that they do need. However, the opinion was also expressed that proposals from the Districts seemed to be improving over time.

V. DISCUSSION

In this final chapter, a discussion and summary of the important themes and findings developed in the previous chapters are provided. The first section revisits the motivation and objectives of the study, and summarizes the response to the objectives through reference to points made in the previous chapters. The remaining two sections provide directed discussion on the possibilities for enhanced efficiency in managing stakeholder input and communicating within USACE.

PURPOSE AND OBJECTIVES

This study explores the role of valuation in environmental projects. The special communication challenges brought forth by the nature of environmental projects are presented, as are opportunities for using collaboration to overcome them. The focus of this analysis is to support valuation activities in addressing the site and portfolio questions. In this report we have argued that environmental projects require a new approach to planning. While some project outputs can be measured through well understood methods, many important outputs cannot be easily valued in quantitative terms. In particular, NED benefits are no longer an appropriate or even feasible metric for assessing many outputs. In the absence of analytical methods for valuation of these outputs, their value must be discovered through a process of collaborative planning with project stakeholders. Therefore, the new challenges of planning for environmental projects include working with stakeholders more closely and at an earlier stage than in the past, balancing those project aspects that can be measured against those that cannot, and communicating project features and values to HQUSACE.

Three objectives for this study were identified earlier in this report. They are: 1) characterize stakeholders' perceptions of environmental planning; 2) identify current communication contexts among stakeholders; and 3) present how stakeholder perceptions and communication affect the determination of evaluation criteria for environmental projects. These objectives build upon one another to the third which addresses the role of communication and collaboration for effective environmental decision-making. Each of these objectives have been addressed in the report through either the presentation of an entire chapter or combinations of chapters.

Stakeholders' Perceptions in Environmental Planning

A prerequisite to understanding perceptions of stakeholders is to first know who a stakeholder is and why they are involved in the environmental project. Chapter II is dedicated to a discussion of who and what are stakeholders, and uses the three case studies as illustrations of these fundamental aspects of communication. In Chapter III, a comparative analysis of environmental

projects and traditional Corps projects is provided. Added insights as to what stakeholders expect during plan formulation of environmental projects are provided.

Communication Contexts Among Stakeholders

A thorough examination of important aspects of communication between stakeholders through identification and discussion of salient themes is provided in Chapter IV. Focus is given to communication because of the enhanced role stakeholders play in environmental projects. Communication among Corps districts and non-Corps stakeholders, within Corps district functions, and throughout the Corps hierarchy are all discussed.

Perception and Communication in Project Evaluation

The final objective, which addresses how stakeholder perceptions and communication affect decisions regarding project features and approval, is really the central facet of this analysis. It ties directly back to the opening question of this report: What is the role of valuation in planning for environmental projects? Clearly, NED procedures leave an analytical gap in valuation procedures for environmental projects. This study examines communication and collaborative planning and identifies opportunities to fill this gap. For example, the topic "Project Proposals Often a Part of a Coordinated Effort" in Chapter III presents the value of a project in relation to an overall watershed plan. These watershed plans have criteria for determining successful restoration that could in turn be used in a specific project. This knowledge creates a means for better understanding the roles participants want to perform as suggested by Goodall (1990), leading to better communication.

Identification of values requires improved communication between levels of USACE as well as the other stakeholders. One significant finding within this effort is that USACE Districts can successfully communicate with the local stakeholders regarding what planning criteria are acceptable for reporting purposes (i.e., the site question). Part of this success can be contributed to the collaboration by USACE Districts and the stakeholders. Feather and Capan (1995) observed in their ten case studies that "[T]he determination of environmental significance is not viewed as a difficult task" (p. 12). This observation is important because whatever is determined to be significant is often the primary object of valuation. The key to this rapid acceptance seems to be early and frequent interaction among USACE Districts and the stakeholders during the planning process. Through these interactions, the concerns and desires of different stakeholders are surfaced, discussed, and incorporated into the development of alternatives. These are some of the same benefits of participation described by Gregory and Keeney (1994). This line of argument is also supported by numerous studies in the management literature which show that participation in decision making can improve the understanding of the alternative selected and commitment to its implementation (Gray, 1989; McCaffrey, Faerman, and Hart, 1995).

The predominant challenge to communicating values seems to exist within USACE itself. Part of this difficulty relates to the "portfolio" question: How should USACE allocate limited resources among many "most desirable" environmental investment decisions? As projects move up the USACE hierarchy for approval, they have to be assessed against others that provide differing benefits. One project may restore one hundred acres of waterfowl habitat and another may only restore a few acres of stream habitat that is a key link in the migration of salmon to spawning areas. While both are important, these two examples do not share a common metric for comparison. In addition to these differing metrics, communication problems exist because there is not the same level of interaction throughout the USACE hierarchy that exists with the stakeholders around a project site. This can be attributed to differences in geographic location as well as different responsibilities.

Because USACE does not maintain environmental projects, comprehensive stakeholder involvement appears to be essential not only for efficient and effective planning, but also for stakeholder acceptance and commitment necessary for adaptive management, monitoring, and maintenance. The cultivation of their commitment is thus transformed from a desirable but secondary element into a critical success factor. For example, many levees failed during the 1993 floods due more to inadequate maintenance by local stakeholders than poor design (although USACE got the majority of the blame). While the consequences of failure in an environmental project are perhaps less severe, the principle is the same.

MANAGING STAKEHOLDER PARTICIPATION

Environmental Projects are Popular, Which Facilitates Cooperation

As mentioned above, a key feature of environmental restoration projects that often distinguishes them from FC/N projects is that virtually everyone involved wants to see some kind of project done. Stakeholders are typically not faced with the same types of extremely difficult tradeoffs (e.g., lives against money). Indeed, one of the clearest and most obvious themes of our analysis is the fact that stakeholders are delighted that USACE is doing environmental restoration projects. Not only are they happy to see projects underway, but they are also glad to be "on the same side" as USACE. This makes the planning process for the environmental project itself go more smoothly, but also appears to enhance working relationships. This is consistent with Gray's (1989) argument that some of the most promising opportunities for collaboration come in situations in which participants have a "shared vision" that they wish to advance. In addition, these improved relationships may have beneficial spill-over effects when the same stakeholders have to meet subsequently about the more controversial flood control and navigation projects.

To better facilitate cooperation with stakeholders, it seems likely that USACE needs to move beyond the "decide-announce-defend" mindset for project planning. While it can be expensive in terms of time and coordination to include others early in the process, this cost must be compared to the potential risks and lost opportunities of waiting too late to include them. The cost of a significant delay or ultimate blocking of the project can be very high. Also, by incorporating stakeholder input

earlier in the process, more valued project alternatives can be developed in the first place. Consistent stakeholder inclusion will also reduce the difficulty of (or perhaps even the need for) those dreaded public meetings. Finally, routine cooperation with stakeholders helps to build relationships that can pay off when other difficult and more controversial projects come along.

The most useful position that USACE can take is to assume that the benefits of a particular project are identified through social interaction and negotiation, and are therefore inherently influenced by the nature of the decision process. Indeed, some stakeholders may even judge the value of a proposed action based in part on their perceptions of the decision-making process (i.e., were my views represented?). Therefore, USACE should place a high priority on learning how to design and conduct the process of stakeholder interaction in ways that produce mutually acceptable and implementable project alternatives. An essential step in this direction is to explicitly and intentionally involve key stakeholders throughout in the process of project planning, rather than assuming that they are passive participants who must be persuaded of the benefits of the project after it is already defined.

However, the collaborative planning process must be carefully managed so that it does not devolve into an anarchy of the whims and idiosyncracies of the particular stakeholders involved. The requirements of USACE policies and project authorities must still be followed, and quantitative analysis should be conducted where valid models are available. Together with the institutional constraints faced by the other stakeholders (e.g., budget cycles, public hearing requirements), these requirements constrain the set of possible agreements among the stakeholders. The District project manager must take the lead in ensuring that these requirements are incorporated effectively into the collaborative planning process.

Including Stakeholders in the Planning Process is Both Feasible and Beneficial

In the case studies we have seen that proactive managers within USACE Districts are already adapting the conventional planning process to the needs of environmental projects. In particular, as they have learned the value of early and consistent stakeholder participation though experience with environmental projects, they have modified the patterns of meetings, planning milestones, frequency of contact, etc. to reflect this reality. Basically, they have been able to increase cooperation with stakeholders within the current system and found it to be valuable.

In environmental projects USACE often plays the role of a neutral planner trying to forge a consensus between the other parties. This is a new type of role for many project managers. While some of the ones we met are learning and adapting as they deal with more projects, they do not have much training to draw on, and must rely on experience and intuition. Because of the new emphasis on this type of role, USACE may need to develop or acquire some expertise in these areas. USACE could develop specialized personnel with group process management skills in each District, provide training for project managers in group process facilitation, or hire consultants on an as-needed basis. We favor the training options because these skills can be used in many other aspects of USACE activities as well.

COMMUNICATION WITHIN USACE

Communication of Project Benefits is More a Problem Within USACE Than Between Stakeholders

One place where better communication of benefits would be helpful is between Districts and HQUSACE. Environmental projects are new to USACE and have more uncertainty about all aspects, from technical and scientific matters to the planning process than traditional flood control and navigation projects. These characteristics make it more difficult for USACE personnel in different locations (or even across functions within a District) to agree on what constitutes an adequate representation of benefits. In part, this appears to result from anchoring on the well understood and more extensive and quantitative planning studies for flood control and navigation projects, and finding it difficult to adequately adjust the mind set for the different realities of environmental projects.

A key finding of this report is that one of the most important stakeholders in any USACE environmental project is usually missing from the planning meetings -- HQUSACE. Further, inadequate or erroneous information about this key stakeholder's perceptions and preferences creates some problems for those who are present. HQUSACE reviewers indicated that on some occasions they have been able to visit project sites on an ad hoc basis, and that this greatly enhanced their appreciation for the potential benefits of a particular project. Could this type of interaction be made more systematic? Other possibilities include holding teleconferences between stakeholders and reviewers and supporting proposals with videos of the project site and stakeholders to better communicate the local context.

Galbraith (1977) suggests that when task uncertainty is high (as in environmental projects), alternative communication channels, such as vertical information systems, should be created. For example, planning-related questions could be handled via computer bulletin boards, electronic mail messages, and access to a centralized databases of examples from previous projects or a compendium of "frequently asked questions." Of course, there are certain related institutional questions that must be addressed, such as possible problems with circumventing the chain of command and determining which responses from HQUSACE qualify as "policy."

Environmental Project Teams Often Struggle Against the Dominant Flood Control and Navigation Culture

Environmental projects are still relatively new to USACE and differ in many important ways from traditional flood control and navigation projects. It can be hard for USACE personnel who have been steeped for so many years in the traditional project mind set to adequately adjust their thinking to the new requirements of environmental projects. While it is tempting to blame certain

individuals for being inflexible, this sentiment is probably overly simplistic and somewhat misguided. Implementing change is hard for people, especially busy professionals, and takes a lot of time (which many USACE personnel are already short on). This tension between environmental and traditional projects is a natural and predictable consequence of rapid change, and should be interpreted as such.

Guidance was Often Not Received in the Districts as Intended by HQUSACE

Communication of guidance also needs improvement, since we found many instances in which District and HQUSACE personnel had different interpretations. Our interviews revealed that District personnel often misjudged HQUSACE's objectives, and that, in many cases, the analyses and information actually desired by HQUSACE could be provided with no additional effort from the Districts.

There seem to be frequent disparities between what HQUSACE personnel intend and what the District personnel internalize. This comes both in the form of different interpretations of the same guidance, and in perceived delays in implementing guidance updates. One strategy already in use, and which is praised by all involved, is the recent workshops on Section 1135 authorization held in the Seattle District. These extended workshops were led by HQUSACE personnel and, by all accounts, greatly improved the shared understanding of the program. Another issue here is that District personnel must have enough time to read and think about the latest guidance in some systematic fashion. No matter what the communication method, if the receiver does not have enough time to consider the message, the communication will fail. Some sort of systematic procedure is needed to ensure that the latest guidance is better understood.

Another way to reduce the uncertainty is to reduce the need for coordination by decentralizing decision-making authority. For example, in both the 1135 and EMP programs there is a $2 million project cost threshold below which HQUSACE review is not required. This type of policy seems to be popular with personnel we talked to in both the Districts and in HQUSACE. Similarly, some responsibilities for technical review of projects has recently been delegated to the Districts. Applying Vroom & Yetton's (1973) classic model for determining the proper level of participation in decision making to the USACE situation suggests that either a greater delegation of environmental projects to the Districts or more interaction between the Districts and HQUSACE in the planning process could be helpful. However, this decentralization would also bring with it risks to the coordination of projects across Districts and regions, and thus to proper management of USACE's project portfolio. These challenges must be balanced against the benefits of having more decisions made by USACE personnel who are closer to a given project.

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APPENDIX A

CASE STUDY PROJECT DESCRIPTIONS

POOL 8 ISLANDS - PHASE II
POOL 8, RIVER MILES 685-7-688.0, UPPER MISSISSIPPI RIVER, WISCONSIN

LOCATION: The site is the open lake-like reaches of pool 8 east of the navigation channel on the Mississippi River in the vicinity of Stoddard, Wisconsin. The site lies within the Upper Mississippi River Wildlife and Fish Refuge.

RESOURCE PROBLEM: Many of the islands in pool 8 providing valuable habitat in the pool have eroded or disappeared. It is believed the increased wind fetch and associated turbidity from river flows are causal factors for the observed loss of valuable aquatic plant beds which are used by fish and migratory waterfowl.

PROPOSED PROJECT: The proposed project is to stabilize about 1,800 linear feet of existing islands and construct about 11,000 linear feet of new islands in the lake-like portion of pool 8 to reduce wave action and the associated turbidity. The islands would be constructed of dredged material and protected with rock riprap or other means to prevent erosion. This project would be a continuation of the overall pool 8 islands project which includes construction of islands in other areas of the pool for habitat enhancement. The project would be constructed in five phases because of its large size and the desire to assess the effectiveness of completed portions of the project before proceeding with additional island construction. Construction of Phase I (located just west of phase II) was essentially completed in 1993.

PROJECT OUTPUTS: Construction of the islands would maintain existing valuable habitat, reduce sediment resuspension caused by wind-generated wave action, and provide physical conditions (low turbidity levels) necessary for the re-establishment of aquatic plant beds in about 500 acres of the lake-like reaches of pool 8. Dredging about 15 acres of selected backwater areas to obtain material for island construction would create much needed deepwater fish habitat. The deepwater areas and additional aquatic plant beds would provide a greater diversity of fisheries habitat. The intent would be to maximize the value of the fish habitat by dredging at locations where the deepwater areas will be adjacent to flowing water (in sloughs) and aquatic vegetation beds.

FINANCIAL DATA: The general design phase of the project is estimated to be $400,000 and construction costs are estimated at $3,600,000 for phase II of the five-phase project. Annual costs for operations and maintenance are estimated at $4,000. Because the project would be located on lands of the National Wildlife Refuge System and "managed as a national wildlife refuge" within the meaning of Section 906(e) of the 1986 Water Resources Development Act (WRDA), general design and construction costs would be 100 percent Federal. The project lands are managed by the U.S. Fish and Wildlife Service (USFWS). Therefore, in accordance with Section 107(b) of the WRDA 1992, all costs for OM&R would be the responsibility of the USFWS.

BEAR CREEK FISH AND WILDLIFE RESTORATION, REDMOND, WA

LOCATION: Bear Creek is located in the City of Redmond, Washington. Fifty-one square miles in Snohomish and King Counties drain into Bear Creek. Its flow enters the Sammamish River, the second largest tributary to Lake Washington. The project site is bordered by a major highway and an area under development for offices and a shopping mall.

RESOURCE PROBLEM: In the 1960's, Bear Creek was channelized and riprapped by the Corps as part of the Sammamish River Channel Improvement Project for purposes of flood control. Excavated material from the channel was sidecast into the adjacent wetlands. As a result, the creek is now a narrow, fast flowing channel, with insufficient habitat to promote salmon spawning, rearing, or winter refuge. Although Bear Creek is one of the most productive fisheries for sockeye salmon in the Puget Sound area, poor habitat conditions have been identified as significantly limiting the production of juveniles.

PROPOSED PROJECT: The proposed project would recreate a natural stream and floodplain by carving meanders into the lower mile of Bear Creek and excavating up to 10 acres of valley floor to the two year recurrence interval floodplain to reestablish wetlands. This construction will include the development of pools and riffles that are suitable salmonid habitat.

PROJECT OUTPUTS: Construction of this project would significantly improve habitat conditions to increase the production of coho, chinook, steelhead, sea-run cutthroat, and sockeye salmon. The restoration of wetland habitat functions will decrease the destructive nature of high-flow events by providing enough increase in area that would reduce flow velocities substantially. This will also improve water quality to the benefit of the Sammamish River and Lake Washington. These improvements will also benefit many amphibians, reptiles, birds, and small mammals.

FINANCIAL DATA: The preliminary cost estimate for implementing the preferred alternative for the project is $3,279,930.00. The project is being developed under the authorization of Section 1135 of the Water Resources Development Act of 1986, as amended through 1992.

ANACOSTIA RIVER AND TRIBUTARIES FEASIBILITY STUDY - PHASE II

LOCATION: The area being examined is the segment of the Anacostia watershed located in Montgomery County and Prince George's County in the state of Maryland. There are a significant number of tributaries to the Anacostia that are being considered for modifications as part of the restoration effort.

RESOURCE PROBLEM: The Phase II feasibility study is to examine and evaluate the problems and opportunities related to restoration of fish and wildlife habitat in the entire Anacostia River basin. The Phase I feasibility study determined that previous water resources projects constructed by the Corps in the watershed had destroyed approximately 2,600 acres of freshwater tidal and non-

tidal wetlands, 500 acres of aquatic habitat, and 800 acres of bottomland hardwoods. Additionally, stormwater runoff has exacerbated streambank erosion in the watershed. This reduction in habitat quality and quantity has led to a reduction in the diversity of native species known to exist in the area as well as the overall quantity of species.

PROPOSED PROJECT: The first feasibility study recommended projects that would restore 80 acres of wetlands, 33 acres of bottomland hardwoods, and five miles of streams. Some of the options being considered as part of this study include retrofitting stormwater retention ponds, marsh creation, improvements for fish passage, streambank stabilization, development of in-stream habitat, channel stabilization, and riparian reforestation.

PROJECT OUTPUTS: One of the primary goals is to increase the diversity of species within the watershed. A significant number of species of fish populations is expected to increase as a result of the improved habitat and better passages to facilitate migration. Water quality is also expected to improve as a result.

FINANCIAL DATA: The current estimate of the study costs is $1,500,000. It is being conducted as a General Investigations study as authorized by the Committee on Public Works and Transportation, U.S. House of Representatives.

APPENDIX B

A METHOD FOR CASE STUDIES OF STAKEHOLDER PARTICIPATION IN USACE ENVIRONMENTAL PROJECTS

INTRODUCTION

A significant element of the development of this report involved holding interviews and focus groups with stakeholders of three USACE restoration projects to gain their insights, priorities, etc. It became apparent that although the primary objective of the interviews and focus groups was to collect data for this report, the procedure may have some additional value as an approach for managing stakeholder input for plan formulation. Given the intent of the USACE Evaluation of Environmental Investments Research Program (EEIRP) to bring pragmatic guidance to the USACE environmental planning community, special documentation of the procedures used was warranted and commissioned. Thus, the objective of this appendix is to document the procedure used in the solicitation of information from stakeholders involved in USACE environmental restoration projects.

Initially, the reader may be led to believe that the application of the method discussed in this paper is easily executed by any individual. However, Yin (1994) cautions anyone against "jumping" to this conclusion, noting that there are five skills necessary for any case study application. They are: ability to ask good questions, be a good listener, be adaptive and flexible, have a firm grasp of the issues being examined, and be unbiased by preconceived notions. Additionally, Bertcher (1994) notes that the application of a particular method to a group can be challenging because of differences in goals, size, history, politics, personalities, quality of leadership, and level of development.

Provided below is a description of how these types of procedures were used in this case. While the strategies and techniques described are specific to this case, the method described here can be adapted for use in other situations (discussed at the end of this document). This appendix is organized according to the following sections: General Design and Consultation, Coordination and Preparation, Stakeholder Interviews, Focus Groups, Summary, Focus Group Applications in Corps Environmental Planning, and Recommended Readings.

GENERAL DESIGN AND CONSULTATION

As part of the design structure for the interviews and focus groups the research team contacted two consultants, Baruch Fischhoff of Carnegie Mellon University and Paul Slovic of Decision Research, to obtain advice on how best to structure and conduct the case study process. Both of these parties are highly accomplished in the areas of group processes and environmental perceptions. The general approach used in this case is adapted from one developed by Gregory and Keeney (1994), which addresses a series of five basic questions (described below). This approach was designed to identify mutually beneficial alternatives among diverse stakeholders who were determining the best land use of an ecologically sensitive area.

The basic design involved two activities at each site. First, interviews of each stakeholder group were held. Second, a facilitated focus group with all of the stakeholder groups was carried out. A focus group format was deemed to be ideal because the responses from the participants are

spontaneous (Huseman, Lahiff, and Penrose 1988). Spontaneity is desired because participants tend to be more open in their responses and less likely to strategically phrase their comments. The individual interviews were used to give the stakeholder an uninterrupted perspective. This allowed the stakeholders to put forth their ideas, priorities, and interpretations without having to respond or react to other stakeholders. Thus, the interviews provided a "pure" representation of the stakeholder perspective. The focus group was designed to allow the stakeholders to interact and discuss perceived differences. Essentially, many of the same topics were discussed as during the interviews, but the focus group allowed each stakeholder to express their ideas to the group. The resultant discussion among the stakeholders for explanation and clarification surfaced additional insights on the perspectives and priorities of each stakeholder.

COORDINATION AND PREPARATION

USACE District offices were contacted to identify stakeholders that were involved in the planning process of the project to be examined. Participants had to meet at least one of the following criteria for participation: contribution of financial or land resources, contribution of physical resources (including monitoring), responsible for maintenance of project, provider of permits, or will be immediately impacted by the construction of the project. In some cases, additional participants were identified during contact with non-Corps stakeholders.

In most cases, the District point of contact (POC) made initial contact with the stakeholders, first seeking their participation, then letting them know that they would be contacted by the research team. The District POC used information from the *Focus Group Purpose and Description* (Exhibit A) as a guide to introducing the project and intended activities to the stakeholder representatives.

Approximately five to seven stakeholder groups participated at each site. The number and nature of stakeholder groups invited varied depending on the project situation. A typical group of direct participant stakeholders included the local USACE District, relevant federal resource agencies (e.g., U.S. Fish and Wildlife Service), state environmental resource agencies (e.g., State Department of Natural Resources), local sponsors, a local environmental group, and affected landowners.

The three Districts that participated (St. Paul, Seattle, Baltimore) were selected because they had expressed interest and enthusiasm in the past regarding innovations in environmental planning. These Districts also had projects that represented a cross-section of funding authorities available for environmental restoration. A summary of these projects are presented in Appendix A.

Coordination and scheduling of the interviews and focus groups were significant undertakings. There was a great deal of enthusiasm on the part of the participants in most cases, and they did what they could to accommodate the scheduling perplexities. The goal was to get each stakeholder to participate in both the interviews and the focus group. This required time, patience, and scheduling creativity.

District personnel were asked to provide the study team with readily available information regarding the project to be examined. This information, primarily in the form of fact sheets and early sections of project study plans, was used to familiarize the study team with the project area and identify possible areas of emphasis during the interview, such as the acceptance of a particularly innovative design feature by the stakeholders.

STAKEHOLDER INTERVIEWS

Individual interviews were conducted, when possible, in the offices of the stakeholders over a two to three day period leading up to the focus group meeting. Each individual interview lasted one and a half to three hours and was attended by anywhere from one to four representatives of the stakeholder group organization. Two or more members of the project team also attended each interview, with one team member serving as the main interviewer. Stakeholders were asked for permission to tape record the interview so the information could be accurately transcribed for later analysis. They were told that there would be no specific attribution of comments to the person who said them. Other team members asked additional probing questions and wrote down information as a backup in case the tape recording failed.

Initially, five questions were generated that formed the basis of the interview instrument. They were:

1) What are the project outputs?

2) What are the priorities over these outputs?

3) What are the alternative solutions?

4) How effective will they be?

5) How will we know if the project succeeds?

After reflection, it was determined that these questions lacked the identification of the project's future sequence of events and what the respondent believed the perceptions of the other stakeholders to be. These concepts were incorporated into the final instrument used to guide the interviews. This interview guide can be found in Exhibit B.

The process used for executing the interviews is critical to successfully procure the full participation of the stakeholders as well as have them focus on the information the study team was examining. Properly conducting the interviews not only gathers valuable information but also provides an opportunity for generating some excitement about participating in the focus group held at the end of the week (Napier and Gershenfeld 1983). Each comment listed in the introduction and

mechanics sections of the interview instrument was discussed in detail with the participants. This served to focus the participants on the information being gathered and to help convince them that there were benefits to be gained through participation in the effort. Fowler (1993) indicates that this detailed approach is essential for increasing the opportunity to obtain thoughtful, accurate answers.

Each topic discussed may have a particular level of preference for a stakeholder. Therefore, the question guide was structured to be open ended, allowing the respondent enough latitude to answer in a manner he or she found to be appropriate without interrupting the flow. The only action the study team took was to guide the respondent back to the topic in question if it appeared the focus of the commentary was shifting. Respondents were given an opportunity to provide any additional information they felt was not extracted during the interview.

It is important to have a map of the area being examined if one is available. If not, material should be available for making sketches. Accommodating this aspect allows the stakeholders to more fully express their perspectives regarding a project and helps them to communicate what their values are regarding the proposed construction.

FOCUS GROUPS

The design of the focus group allowed for the open solicitation and discussion of information from and among the stakeholders. It was decided that three hours would be enough time to conduct the focus group, both because the needed information could be gathered in that amount of time and it would not consume too much time from the participants' schedules.

The focus group commenced with introductions led by the facilitator. This was followed by a brief overview of the research project as a whole and the specific research activities for the subject case study. All questions regarding the activities and research were fielded before the focus group activities began. A transcripted version of one of the focus group introductions is found in Exhibit C.

The initial element of the focus group utilized Nominal Group Technique, a discussion procedure, to solicit positive and negative views of the planning effort. This approach was chosen because it can "neutralize differences in status and verbal dominance among group members" (Moore 1987). In Nominal Group Technique, participants silently generate responses to a question, list the responses in a round-robin approach, and then discuss the information that was posted. The question posed to the participants was:

> *What are the positive and negative aspects of the planning process and the way the project was conducted?*

Participants were asked first to generate their ideas silently by writing concise statements/phrases on a small sheet of paper. This allowed the participants to list their perspectives without challenge

from the rest of the group. Their comments were posted by the facilitator in round-robin fashion on butcher paper. The butcher paper was posted on the walls as a written record for the stakeholders review. A sample of positive and negative perspectives is listed below.

POSITIVES

a. Communication has been good.
b. Project addresses real habitat problems.
c. Opportunity for project money to restore an important steam segment.
d. Good recognition of the problem among the parties so far.
e. Short time frame to get things done, promotes construction sooner.
f. Study team has a good grasp of what 1135 requires.
g. Basin plan had a lot of data, sponsors were/are instrumental.
h. Cooperation and information exchange is high.

NEGATIVES

a. Worried about the process, if the funding will actually come through.
b. Unknown approval criteria.
c. Tough identifying/justifying the area.
d. Time constraints on the study. (1135)
e. Meeting outside agency interests.
f. Requires a local sponsor.
g. Fear process will go too slow.
h. Project will not resolve up and downstream problems.

This activity performs several functions important to the success of the focus group. First, it serves as ice-breaker, giving the participants a chance to speak and listen in a casual yet structured setting. Secondly, it allows participants the opportunity to express their perspective on the project to the rest of the group. Finally, it provides the general protocol of focus group participation: namely everyone has an opportunity to speak and be heard.

Following the postings, the stakeholders were asked to silently evaluate the perspectives that were generated. Participants were then asked to comment about any observations or surprises that were posted. This interaction was seen as beneficial for both generating information about the stakeholders' perspectives as well as allowing the stakeholders to clarify their positions. After this discussion was held, the stakeholders were asked to identify any common themes that emerged from the listings.

The final activity in the focus groups was to solicit ideas for improvement of the current planning process being used. This also generated valuable information because there were instances where a perceived problem was identified and able to be remedied or accounted for in the upcoming stages of the planning process.

When approximately ten minutes were left in the session, the facilitator summarized the results of the focus group by restating the activities the participants completed and by identifying significant discussions or breakthroughs that occurred during the session. Each participant was asked to provide their impressions of the focus group and its perceived impact on the future of the project in which they were involved. Once this was done, the facilitator thanked everyone for their participation and dismissed them.

After the first (of three) focus group was conducted, one comment made by many participants was their lack of awareness of the Corps planning timeline. The study team decided it would be appropriate to modify the format of the remaining two focus groups to allow the Corps District project manager to present the general timeline of the project. This activity was placed after the discussion of the lists of positive and negative attributes for the project. A sample timeline is shown in Exhibit D. This exercise constituted not only the identification of important deadlines for the Corps but also the identification of important deadlines and data needs of the other stakeholders. Overall, this was determined to be one of the most valuable activities for all of the participants because it identified vital junctures for the completion of the feasibility study process, such as the preparation of a budget request to local government for cost sharing funds. The stakeholders indicated that if this information were found out much later there would be difficulty in securing the funding because their budgetary cycles were different than the Corps. This in turn could delay the project at least one year.

SUMMARY: FOCUS GROUP APPLICATIONS IN CORPS ENVIRONMENTAL PLANNING

This research effort successfully yielded both good data and good interaction among all the participants. Although there is a natural tendency to give guarded responses when answering questions about a project where negotiations are involved, all the participants were willing to share their ideas and perspectives. Responses given during the focus group activities were not accusatory; instead, the stakeholders used this time to increase their knowledge about the Corps process and improve their current planning situation. Thus, this process provided opportunities for the stakeholders to receive some practical benefit from their participation.

Some of the planning situations where this type of approach would be useful in environmental restoration planning efforts include determining environmental significance, identifying valuation components for the evaluation of the project, and examining proposed alternatives. Each of these situations do not necessarily have clear solutions available. Additionally, there is a high likelihood that there will be different interpretations of what is most important to the stakeholders based on their perception of the problem and agency affiliation.

The application of this approach is probably most successful if it is first used early in a planning effort because stakeholders are only beginning to form values regarding both the project and the people involved. This process would not provide as many benefits later in a planning effort because some stakeholders' opinions of the other participants would prevent them from answering in an open manner.

It is important that the discussion leader have a non-biased perspective. Stakeholders are more likely to perceive a neutral facilitator as someone with no vested interest in the outcome of the project and therefore less likely to favor a particular agency or group. As stated earlier, stakeholders may not be as open with their responses if they believe their information would compromise their negotiating position.

Uniqueness of environmental planning situations is inherent to its nature. As such, the execution of this method will most likely require some adjustment to the situation at hand. This is evident from the addition of the timeline activity to the focus group exercise.

RECOMMENDED READINGS

The adaptation and application of this type of approach requires additional preparation for successful implementation. This section suggests some readings that would be useful in gaining a greater familiarity for this and other group approaches. Descriptions of each book will indicate topics of importance. Bibliographic information on each of these sources can be found in the Reference list.

Group Techniques for Idea Building by Carl M. Moore

This book presents four approaches for gathering information to answer research questions. In addition to a presentation of Nominal Group Technique, Moore describes Ideawriting, Delphi, and Interpretive Structural Modeling approaches for generating, developing, and selecting ideas. A list of criteria is provided to assist in the selection of the techniques listed.

Group Participation: Techniques for Leaders and Members by Harvey J. Bertcher

Bertcher provides a detailed description of desired behaviors from leaders and participants in a group and identifies products that can be developed in a group setting. Each chapter contains exercises to test the reader's perceptions of each behavior or product and provides detailed descriptions of how to develop desired behaviors in both leaders and members. This information is essential for improving the interaction among group members as well as the results of a group's efforts.

Making Groups Work: A Guide for Group Leaders **by Rodney Napier and Matti Gershenfeld**

This text provides a combination of theory and approaches for developing group interaction. One of the appendices contains information that can guide facilitators through roles, approaches to groups, and using techniques. Another topic in this text not often found in other texts is a discussion of evaluation techniques and their value to group processes.

Creating Policy Alternatives Using Stakeholder Values **by Robin Gregory and Ralph Keeney**

The article from *Management Science* addresses how to identify improved alternatives based on clearly articulated stakeholder values. Gregory and Keeney's customized approach to bringing diversified stakeholders together in developing mutually beneficial alternatives is discussed and a test case of the approach is provided as an example of what results it provides.

EXHIBIT A: FOCUS GROUP PURPOSE AND DESCRIPTION

RESEARCH OBJECTIVE

The research is aimed at gaining a better understanding of how individuals and agency representatives (stakeholders) involved in Corps environmental projects perceive environmental management challenges. This will provide Corps planners with improved information on the needs and perceptions of stakeholders so that the planning process for environmental projects can be both more efficient and less subject to unexpected difficulties down the road.

This project is being carried out under the U.S. Army Corps of Engineers Evaluation of Environmental Investments Research Program, which is a three-year research program aimed at developing analytical tools for use in the environmental plan formulation process.

FOCUS GROUP PURPOSE

General models that describe stakeholder perceptions of environmental projects are being developed based on current literature on the subject. The focus groups are a means of gathering data to more clearly articulate these models and to adapt them for specific application to Corps environmental projects. The focus group discussions will be centered around actual Corps environmental projects.

FOCUS GROUP FORMAT

Interviews With Each Stakeholder Group

The first activity in the focus group session will be interview sessions with representatives of each stakeholder group. It is anticipated that approximately five stakeholder groups will be involved. The stakeholder groups asked to participate will depend on the project situation and will be selected in concert with the responsible Corps District. A typical group of stakeholders to participate in the focus groups might include: Corps District, federal resource agency (e.g., U.S. Fish and Wildlife Service), state environmental resource agency (e.g., State Department of Natural Resources), local sponsor, and local environmental group.

The research team will conduct an interview at the office of each stakeholder group. Three participants (at minimum) from each group would serve the process most efficiently and would be interviewed collectively in a two to three hour session. Each session will focus on the following

questions directed at the subject Corps project: 1) What are the outputs? 2) What are the priorities over these outputs? 3) What are the alternative solutions? 4) How effective will they be? 5) How will we know if the project succeeded?

Group Activities

After the separate interviews of the stakeholder groups are complete, a group session will be held with participants from all stakeholder groups. This will be a facilitated meeting where each of the stakeholder groups will be given the opportunity to provide their insights on the environmental management challenge and also hear how other stakeholders respond. Opportunities for interaction among the participants will be furnished during the session. The product of the group session will be a listing of key issues and concerns along with an identification of important areas of agreement and disagreement about the respective priorities of the issues.

EXHIBIT B: GUIDE FOR INTERVIEWS WITH INDIVIDUAL STAKEHOLDERS

PERSONAL INTRODUCTIONS

The lead interviewer should initiate exchange of names, greetings, etc. and should ensure that all present have had an opportunity to introduce themselves to one another.

RESEARCH INTRODUCTION

After all are seated, the lead interviewer will provide the introductory remarks. These comments will include:

- Goals of the project: Gain enhanced insights of how individuals and agency representatives (stakeholders) involved in environmental projects perceive environmental management challenges. This will lead to the development of new procedures for building cooperation between stakeholders and help to solve problems before they occur.
- Goals of interviews: Solicit honest and open commentary on salient dimensions of the selected environmental problems.
- This is a unique ground-breaking research opportunity.
- We are seeking perspectives - no right or wrong answers.
- They are the experts, which is why they are being interviewed.

INTERVIEW MECHANICS

Next, the lead interviewer will briefly review the activities involved in the interview:

- Open format, information being gathered under general themes.
- Interview is being tape recorded and backed-up with hand notes.
- Anonymity will be preserved, but we will likely use quotes that exemplify certain points.

At this point the lead interviewer should check signals with the participants and ask if they have any questions and get their permission to move into the discussion arena.

THEMATIC DISCUSSION

As an introduction, the participants should be allowed to present their perspectives regarding the history of the subject project. This will provide the research team with an opportunity to "earmark" certain aspects for examination under the general categories.

- What is the history of the project?
  - Were there any decision-making teams created?
  - Were there any specific resources provided by your agency?
  - Were there any disruptions to the process? What was done to overcome them?
- What do you expect the future sequence of events to be? (What's next?)
- What are the goals of the project? How will you know if the project achieves those goals?
  - How are they characterized?
  - Are some more important than others?
  - Are there any that cannot be compromised?
  - Are there any that are not included that should be?
  - Are there any trade-offs that have to be made?
- What are the range of actions that could be followed for this project?
  - How effective are they for maximizing benefits?
  - What are the steps that should be followed?
- Who will be affected by this project? and how?
  - What is your relationship with those that will be affected?
  - What are your gains/losses from the project?
  - Has the media had any influence on this project?
- Is there anything you would like to see changed about how this project will be completed?
  - What should the processes be?

DISCUSSION OF OTHER ISSUES AND CLOSURE

- Are there any important issues we have not covered that you would like to address?

At the close of the interview, the lead interviewer will thank the participants for contributing their valuable time to this research effort. Addresses of the participants will be collected so thank you letters can be mailed to them.

EXHIBIT C: SAMPLE OPENING FOR FOCUS GROUPS

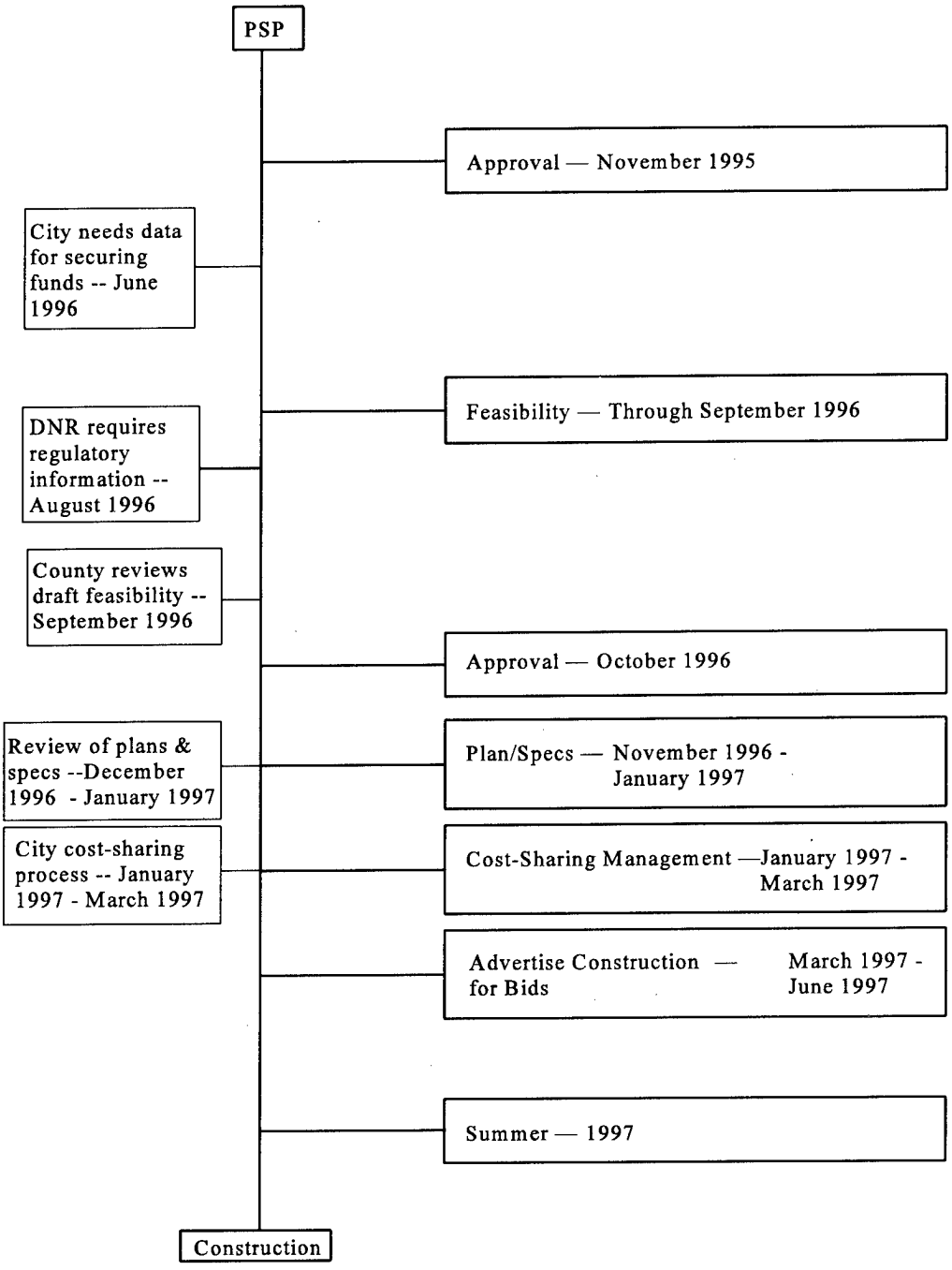
Offered by lead facilitator ....

We have great information in the individual interviews, and I would like to say "thanks" up front. This is going to serve our research purposes well. This last phase of the case study is structured to allow you, as a group, to interact on certain issues and for us to observe and facilitate information regarding the issue of planning for environmental projects. Our goal here is the development of procedures dedicated to improving stakeholder communications for plan formulation. We already have some of that information from you. The Corps is interested in making improvements, some efficiencies, in the planning process. This is the goal. Efficient planning leads to better projects. If you consider everything and come up with a good plan, that would be the better concept. A way to get a more efficient plan, especially given the multitude of stakeholders, is to better understand the stakeholders' perspectives. This is our focus in this research effort: to get an understanding of the perspectives and how the Corps can effectively bring them into the planning process. Before we get started, I want to go around the room and introduce ourselves. {Introductions begin, starting with the facilitator and then continuing around the room. Once finished, then continue.}

We think the group here can generate a good exchange of information, both for your benefit and for the purpose of our project. And again, thanks again for being here. There are going to be some brainstorming activities, some silent generation of ideas. I am going to post information you offer, but mainly we want to listen to what you have to say. We are targeting noon to wrap this up (or whatever three hours from the start time is). We will have a break about half way through, restrooms are located (describe locations). Are there any other logistical questions, issues, or needs? (After addressing all needs and concerns, continue.)

The focus, as we discussed during our interviews, was (insert the name and description of the project being discussed here). What I would like you to do, as a means of getting your perspectives on this project, is to start writing some concise statements regarding what you view as positive and negative aspects of the planning process for this project. After you finish, we will go around the room and post these for later discussion. So, please take about five minutes and list what you feel are positive and negative aspects of the planning process of the project.

EXHIBIT D: SAMPLE PROJECT TIMELINE



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13. ABSTRACT *(Maximum 200 words)*
This report was prepared under the Monetary and Other Valuation Techniques work unit of the USACE Evaluation of Environmental Investments Research Program. This report describes how understanding the perspectives of stakeholders in USACE environmental projects might improve the identification and communication of project benefits. Valuation of project features is a central component of the Corps decision-making framework. The outputs of environmental projects are multiple, varied, and usually difficult to measure in monetary terms, given the current state of the art. This report is based, in part, on three case studies of current USACE environmental projects as well as interviews with USACE Headquarters personnel involved in policy making for or review of environmental projects. The goal of the interviews and meetings was to better understand project priorities from individual stakeholders and to observe interchange on selected issues among the stakeholders. Comprehensive stakeholder involvement appears to be essential not only to efficient and effective planning, but also to the stakeholder buy-in and commitment necessary for adaptive management, monitoring, and maintenance, since USACE will not maintain these projects.

14. SUBJECT TERMS
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