Project Planning in Collaboration with Government Entities

Practical Approaches

by

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Executive Summary

Collaboration is emerging as an important activity within the Corps of Engineers. The Corps' Strategic Plan for the Civil Works Program for FY 2004-2009 and the "Actions for Change" promulgated by the Chief of Engineers in 2005 emphasize the agency's intention to solve problems more systematically and inclusively by collaborating with stakeholders in the decision-making process.

Engineer Circular 1105-2-409, published in 2005, promotes a specific form of collaboration—that with other Federal, state, and local governmental agencies—in the pursuit of national interests. This guidance introduces a new concept, that of a "National Interest Plan," with the intention of expanding the Corps' planning perspective beyond National Economic Development and National Ecosystem Restoration objectives. A National Interest Plan embraces a broader approach to problem solving by incorporating elements that address traditional Corps missions and also elements that have national importance as expressed in the missions of other collaborating governmental agencies. Comprehensive and effective collaboration is paramount in the development of the National Interest Plan.

In addition to the renewed emphasis on collaboration, the EC reintroduces the four evaluation accounts as described in the Principles and Guidelines, 1983, reinforcing the idea that Corps planning should take into consideration regional economic and other social effects and that these considerations can contribute to the formulation of plans. The concept of net beneficial effects is discussed along with how trade-off analysis can be useful in identifying a National Interest Plan that possesses the best mix of benefits across the four accounts and among the interests of collaborators.

This handbook explores ways that the Corps District planner can identify opportunities to collaborate throughout all phases of the planning process. The handbook briefly touches on collaborative activities across Federal agencies, at the regional level, and at the project level in order to inform the District planner that these resources are available for use. The handbook also encourages the District planner to initiate collaborative activities with others as appropriate during the planning process to produce plans that cross Federal agency missions and authorities. Cost-sharing among collaborating partners is also discussed.

With this initial release, the scope of this handbook is limited to collaboration with other government entities in the context of Corps project planning as prescribed in recent guidance. The handbook is presented not as a comprehensive document on collaborative planning, but as an introductory practical guide to District planners. Other documents are available and referenced throughout this handbook that address collaboration in greater detail and in a variety of

applications. Also, other resources are currently under development at IWR to supplement this introductory guide for collaboration at the field level. This handbook is presented as a dynamic document with the capacity for change and growth as new information is developed and new references are made available.

Section I
Project Planning in Collaboration with Government Entities

A. Introduction

This handbook is an introductory look at the concept of collaboration as it applies to problem solving in a specific way—that of working with Federal, state, and local governmental agencies—and is intended for use by field planners, those people who engage in hands-on planning. While limited in its initial scope, this handbook is considered to be a dynamic document and is presented in a format that is capable of growing and changing as new information and guidance emerges.

The handbook was originally envisioned to serve as an interpretation of Engineer Circular 1105-2-409, published in 2005. With the expiration of the guidance and the incorporation of key concepts into regulation, the intention the handbook remains relatively the same—to provide some insight into collaboration and some examples that can help planners as they work to solve complex problems.

B. Background

Recent events of national significance stress a Federal need for a more comprehensive and integrated approach to problem solving. Additionally, budgetary constraints emphasize the need to address the fragmentation of government and government spending to achieve a more efficient allocation of scarce resources. One way to address these needs is through collaboration with others. Issuance of the Corps' Strategic Plan for the Civil Works Program for FY 2004-2009 (Strategic Plan) and "Actions for Change"[1], and the publication of current guidance[2] underscore the agency's support for collaborative efforts addressing objectives and interests that express the full range of Federal interest.

One of the Strategic Plan's four key concepts for integrated water resources management (IWRM) is a "Collaborative Approach." Collaboration, as expressed in the Strategic Plan,

> *"can involve several Federal Agencies,…State and local agencies, the private sector, and interest groups and can take many forms. Each participating entity will bring its own legal authorities, skills and knowledge, history, and contributions to funding."*

[1] U.S. Army Corps of Engineers, "12 Points for Change," 24 August, 2006
[2] Department of the Army, U.S. Army Corps of Engineers, "Planning in a Collaborative Environment," EC 1105-2-409, Washington, D.C., 31 May 2005.

The first of the Actions for Change promotes an integrated and systems-based approach to project planning and implementation.

> *"The system within which a proposed project will perform must be understood as well as the local and regional implications of alternative concepts for achieving project goals."*

As with the Strategic Plan and the Actions for Change, current planning guidance encourages Corps planners to include other Federal, State, and local agencies in collaborative undertakings with the intent of producing more comprehensive strategies for dealing with water resources problems. The following discussion will focus on how the current Corps project planning process can accommodate other government entities' interests and how the full effects of proposed actions can be described. The document will consider practical ways that the planner can comply with the intent of current guidance, especially with regard to plan formulation.

Corps planners at the District level give credence to the benefits of collaboration with the following comments:

a) "Although time consuming and costly early on in the process, the successful outcomes achieved would not have been possible without collaboration. In the end, collaboration produced long-term savings."

b) "Collaboration among diverse and varied stakeholders was essential to the success of the planning process. Negative outcomes were avoided with collaboration."[3]

The intended audience for this document is Corps District planners, whether they are community planners, engineers, economists, social scientists, or biologists/ecologists. Few of today's Corps planners were practicing their art prior to 1983 and the publication of Principles and Guidelines (P&G)[4]. Then was a time when four evaluation accounts for Corps project planning were actively addressed: National Economic Development (NED); Environmental Quality (EQ); Regional Economic Development (RED); and Social Well-being [now referenced in P&G as Other Social Effects (OSE)]. Planning guidance issued 31 May 2005[5] reintroduced the four accounts originated with Principles

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[3] James Creighton, PhD, Collaborative Planning in Action: Case Studies of Collaborative Planning in the US Army Corps of Engineers, Institute for Water Resources, revised final draft, August 2007.

[4] U.S. Water Resources Council, James G. Watt, Chairman, Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, March 10, 1983.

[5] Department of the Army, U.S. Army Corps of Engineers, "Planning in a Collaborative Environment," EC 1105-2-409, Washington, D.C., 31 May 2005.

and Standards, 1973[6] and 1980,[7] and which were required for display but deemphasized in P&G, 1983. With the publication of the P&G, the four evaluation accounts were maintained but the emphasis shifted to the NED account with national economic development (NED) as the primary Federal objective "consistent with protecting the Nation's environment…." National Ecosystem Restoration (NER) was added as a primary Corps mission by 1999. Over the years, field experience with plan formulation using the four accounts has waned. However, current guidance requires once again that Corps planning address not only NED benefits but also other Federal, regional, and local contributions with the statement that

> *"Any alternative plan that has net beneficial effects across the four P&G accounts may be recommended…."*[8]

This reemphasis on the four accounts suggests a way to broaden the Corps planning perspective.

Corps planners are acquainted with single purpose, multiple purpose, and watershed planning within the traditional Corps civil works missions. Project planning requires involvement and collaboration with many diverse stakeholders, partners and interest groups. The extent of collaboration on a given planning study varies according to the scope, complexity and resources available. The concept of collaboration such as that envisioned with Shared Vision Planning involves all interested parties in the decision-making process. There is a wealth of information compiled by the Institute for Water Resources (IWR) relating to the pertinent topics of collaborative planning and Integrated Water Resources Management (IWRM).

Collaborators, as defined within this handbook, are a subset of a more inclusive universe of collaborators. The specific construct of **collaboration,** in this application, **is defined as Federal, State, and local agencies and institutions that possess financial and other resources with which to actively participate in a study and that can commit those resources to the planning process and project implementation.** Current guidance promotes Corps collaboration with Federal, State, and local agencies in the pursuit of national interests beyond traditional Corps purposes. Collaboration with other stakeholders is also encouraged to the extent practicable and feasible.

One objective of collaboration among government entities is to reduce the fragmentation of government and to use scarce Federal resources more

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[6] Principles and Standards for Planning Water and Related Land Resources, September 10, 1973

[7] Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning (Level C) and Proposed Revisions to the Standards for Planning Water and Related Land Resources, September 29, 1980

[8] Department of the Army, U.S. Army Corps of Engineers, "Planning in a Collaborative Environment," EC 1105-2-409, Washington, D.C., 31 May 2005.

efficiently. Also of major interest to the nation is the full disclosure of project effects or consequences within the local and regional environment, not just at the national level. In addition, a fundamental purpose of collaboration is to produce solutions to problems that address elements of interest and concern sufficiently to be implementable.

Section II
Collaboration, Partnering, and Pubic Involvement

Recent initiatives move the Corps toward minimizing the gap between planning exclusively for Corps traditional purposes and planning in full consideration of national Federal interests reflected in the missions of other Federal agencies.

These initiatives advocate taking a more holistic view to find sustainable water resources solutions by partnering with other Federal agencies, tribes, State and local governments, and non-governmental organizations (NGOs). Under these principles, the Corps will:

* Partner with others to incorporate multiple perspectives.
* Use systems approaches to understand the connections between natural and man-made systems.
* Analyze water resources problems at larger scales such as the watershed.
* Strive to achieve multiple goals and functions using water and related resources in a balanced manner.

On a practical level, this approach as stated in current guidance can translate into a variety of activities:

* Sharing data and information.
* Providing technical assistance, such as planning assistance to states.
* Working with local watershed councils as they develop watershed management plans, possibly in tandem with counties, states, federal agencies, and others.
* Improving watershed models or parts of models.
* Improvements in the regulatory program.
* Developing, operating, and maintaining traditional Corps projects in a more integrated, environmentally sustainable manner.
* Developing plans/projects in collaboration with other Federal and non-Federal entities.[9]

The interest in collaboration stems from the recognition that no single Federal agency has the authority to solve all of the nation's water challenges. The Strategic Plan envisions the Corps integrating its problem solving activities with others, and encourages collaborations that bring a variety of resources, authorities, and perspectives to the table.

[9] Ayers, Donna, et al., "Civil Works Strategic Plan," Engineer Update, May 2004, Vol. 28, No. 5, U.S. Army Corps of Engineers

The concept of collaboration in the context of current guidance implies incorporating Corps missions, expertise, and information with other agency missions. Wherever there exists potential to collaborate by sharing information, capabilities, and interests, Corps planners are encouraged to invite the participation of Federal, State and local interests. Legal authorities of each agency will define the nature and extent of their collaboration and participation in projects.

A. Hierarchy of Collaboration

Collaboration can occur on many levels in a hierarchical fashion. At the national level, interagency agreements are formalized with Memoranda of Understanding and Memoranda of Agreement (MOU/MOA). Numerous MOA/MOUs exist between the Corps and other Federal agencies. The aspects of the MOUs vary with the agreement. Some involve pilot or demonstration projects that are funded specifically to achieve a stated goal or to test viabilities of strategies. Others are agreements with regard to policy. Planners are encouraged to exercise the opportunities for collaboration afforded by these MOUs/MOAs to work with other agencies.

Nationwide. An example of a nationwide collaborative effort follows with a link below to an MOU between the Corps of Engineers and the United States Geological Survey (USGS).

COE Collaboration with USGS

This is a two-way MOA between USGS and Department of the Army for Corps planning, design, construction, environmental restoration, research and design, hazardous material removal, engineering and technical assistance, and training; and for USGS investigations and training in earth sciences, remote sensing and geospatial data applications, water resources and hydrologic research, information systems, and other related goods/services for both Civil Works and military projects.

Systems-wide. Other collaboration efforts are made across systems such as sediment transport. The following link provides information regarding collaborative efforts among the Corps and numerous other Federal agencies to perform research and develop strategies for sediment management.

Regional Sediment Management

Across Programs. And too programmatic collaborative efforts are undertaken between governmental agencies and private corporations to achieve shared goals. Such an example is found at the following link:

Coastal America

Coastal America is a process aimed at restoring and preserving coastal ecosystems and addressing critical environmental issues. The Coastal America

Partnership was launched in 1991 by former President George H.W. Bush, and formalized in 1992 with a Memorandum of Understanding (MOU) signed by nine sub-cabinet level agency representatives. These representatives committed their agencies to work together and integrate their efforts with state, local and nongovernmental activities.

Project level. Collaboration occurs also at the project level. The decision to work in collaboration with other government entities will be case specific. The opportunity to collaborate may not present itself with smaller-scoped studies but that should not deter the planner from investigating the potential to work with others. Opportunities to collaborate with others in larger studies may be more apparent or may be at the invitation of others outside the Corps such as when a Corps project is part of a regional master plan undertaken by several collaborating partners. The following examples describe how the Corps collaborated with multiple partners in large studies.

Trinity River Vision

A few of the important aspects of the Trinity River Vision Central City project example are the language developed for initiating the collaborative effort, the stated objectives, and the support for regional economic development.

Floodplain and Watershed Management in the Napa Valley

Some important aspects of the Napa Valley project are the funding sources and how the Corps' mission was aligned with local interests.

Poplar Island Environmental Restoration Study

This example of beneficial use of dredged material demonstrates how public and private partners can achieve multiple objectives through collaboration.

While the previous examples are intended to offer a brief glimpse of the variety of opportunities afforded through collaboration, many studies possess aspects that are unique to the specific locale, partners, and situation. In those cases where a specific opportunity suggests that the District enter into a MOU/MOA with others, it is best to get the District's Office of Counsel involved.

B. First Steps toward Collaborating with Other Government Entities

In a report dated October 2005[10] the Government Accountability Office (GAO) identified key practices that can help enhance and sustain collaboration among federal agencies. In this report, collaboration was broadly defined as any

[10] Government Accounting Office, "Results Oriented Government, Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies," GAO-06-15, Washington, D.C.: October, 2005

joint activity that is intended to produce more public value as compared to each agency acting alone. Eight practices were identified to help enhance and sustain collaboration. Five of these practices are directly applicable to the Corps project planning process. These are:

* Define and articulate a common outcome.
* Establish mutually reinforcing or joint strategies.
* Identify and address needs by leveraging resources.
* Agree on roles and responsibilities.
* Establish compatible policies, procedures and other means to operate across agency boundaries.

Ideally, the intent to collaborate in Corps project planning will emerge before a study gets underway so that agreements can be reached and resources allocated to the collaborative process. Those activities in which the collaborators will participate should be included in the Project Management Plan (PMP). Collaboration activities between the Corps and other agencies will most likely require other agreements as well.

The Scoping Process. During the course of the study as the study team becomes better acquainted with the physical and human dynamics of the area, opportunities for collaboration may emerge that were not apparent in the beginning. As opportunities become apparent, steps can be taken to incorporate collaboration into the overall study process.

In the absence of an overarching authorization or directive, District planners may want to investigate other opportunities for collaboration at the field level. An important aspect of current planning guidance is its statement that

> *"highest budget priority will be given to collaborative planning activities that embrace the "full range of the national Federal interest."*

This statement holds considerable potential but can be a bit overwhelming for planners who have been concentrating on NED and NER analysis. What is meant by "*full range of the national Federal interest*?"

Given the proliferation of Federal programs and agendas, a planner might logically conclude that almost any problem presents a Federal interest if Federal programs and funding are available to address it. Many opportunities for Federal involvement exist and it is likely that at least one other Federal interest, apart from the Corps' mission, could be or is being pursued in the study area of a Corps proposed project, especially one that encompasses the geographic expanse of a watershed. Therefore, a simple litmus test of national Federal interest could be the presence of Federal programs and funding. As noted in the hyperlink above and in Table 1 , Federal agencies provide programs and funding for a variety of needs.

But how does a planner know which Federal interests are of consequence to a Corps study? Many times these Federal interests are voiced in the expressed interests of Legislative representatives, the non-Federal sponsor, local community leaders, the media and other stakeholders.

The question of Federal interest and agency involvement has been a topic for discussion for some time within Corps planning circles. Note the excerpt from the Planning Manual, 1996[11].

> *What is to be done about problems and opportunities that exceed the current policies and authorities of the partners, especially the Corps? High crime rates near the river, for example, may be a significant issue, but it's unlikely this problem can be addressed by the Corps. When another entity has an established responsibility for the problem identified, it may be possible to involve them in the study process. For example, although crime is well beyond the authority of the Corps' programs, it may be possible to solicit police and other public safety agencies' input in the design of floodwalls to assure that access through the wall, visibility of pedestrians, and minimization of potential hiding places are considered in project design.*
>
> *In other cases, information about problems or opportunities may be passed on to the appropriate authorities. Suppose, for example, a traffic flow problem is identified during this stage of the study. Even if it is beyond the scope of the water resource study, this information can be passed along to the appropriate agency for attention, rather than be ignored because it is beyond the Corps' authority.*
>
> *In some instances, problems may be water-related but beyond the current Corps' authorities and policies. There are two schools of thought on this. One is to decline involvement in any activities that are beyond the Corps' authority. The other is to look for a way to blend these water resources needs into existing authorities, perhaps stretching and extending them a little. Acid mine drainage is an example of a problem over which the Corps has no current authority. New environmental programs and a renewed interest in watershed planning have provided the impetus for at least one district to address this problem. One aspect of watershed planning is to identify issues like these that might require a broader partnership. Bringing other Federal, State, and local agencies with an interest in these "new" issues into the partnership can be an effective way to develop more comprehensive plans.*

This passage gives insight into what is likely to be discovered when planners look intently at their study areas. No one problem exists in isolation of other

[11] Yoe, Charles E., and Kenneth D. Orth, Planning Manual, IWR Report 96-R-21, Institute for Water Resources, November 1996

problems or opportunities. Current guidance acknowledges that multiple problems and opportunities coincide within a geographic area. Making the most of Corps planning expertise can help to identify and remediate problems more efficiently by applying a broader perspective to the planning process.

Also, recognize that collaborative activities may be based on common geography, institutions, objectives, or time which simply means that there are multiple ways to integrate activities into a comprehensive approach. Since authority for water resources planning and management is fragmented across Federal agencies and State and local authorities and institutions, it is wise to try to coordinate efforts.[12] Collaboration with other government entities addresses the fragmentation of government and the need to use taxpayer money efficiently.

Know the Study Area. Getting to know the study area seems to be an obvious task for the planner but many times the study team too narrowly defines the area of analysis in terms of Corps interests, such as what is required to hydrologically profile a stream or to inventory capital assets at risk. What collaboration and integration of activities and interests aim at achieving is a greater understanding of the general framework within which Corps projects operate and a broader grasp of how Corps projects affect the surrounding social, cultural, and economic, as well as natural, environment. It is only by considering all the elements interacting within an area that a planner can develop a workable plan and anticipate its full effects.

There are several ways to achieve an adequate level of understanding of social, cultural, economic, and environmental considerations. Researching the media and other electronic and print material for content can provide an indication of important issues in the study area. Meeting with local community leaders, local government officials, and the public allows planners to build rapport and gain insight into the area not only for identifying Federal, State, and local interests but also for establishing further contacts within the area and for learning and describing the social and economic context of their planning efforts.

One way to gauge Federal interest is to determine the extent of Federal investment being made in the area. The planner can identify local and Federal interest in an area by determining the type and amount of Federal revenue channeled to the area through funding clearinghouses such as States, regional councils of government or local community government and planning offices. Generally Federal funding is distributed to local entities through State governments and regional councils. The Corps planner can contact the regional council or the local city planning or governing offices for information regarding Federal allocations and ongoing plans.

[12] Hal Cardwell, et al., "Integrated Water Resources Management: Definitions and Conceptual Musings," a paper submitted to the Journal of Contemporary Water Management, IWR, 22 August 2006.

Another recommendation in planning guidance pertaining to activities within the Corps is that

> *"Collaboration can improve the regulatory climate by addressing all the regulatory issues together and reaching agreements for siting various activities in advance."*

Not only are planners encouraged to collaborate outside the Agency, they are also encouraged to collaborate with regulators and others within the Corps for a unified and consistent approach to addressing water resource problems. Regulators may be aware of regulatory actions within a study area that can add insight into the planning process. Regulators maintain a database of regulatory actions whose information may be a valuable addition to the dataset of a study.

Using other resources within the Corps can also be helpful. Interviewing not only regulators but also project managers and other Corps personnel with other projects within close proximity can help the planner understand the study area faster and identify opportunities for collaboration. Representatives of natural resource agencies sit on Corps study teams and other advisory groups to the Corps planning process and can add their view of the Federal interest in the study area. Another idea for holistic planning is the formation of "watershed" teams, groups of in-house experts who maintain familiarity with specific watersheds within Districts.

Example of an Opportunity

> The Corps is beginning a Feasibility study for flood damage reduction within a small Midwestern city along the Mississippi River. After talking with local planning officials, the Corps planner discovers that the city has received a grant from the U.S. Department of Agriculture to study revitalization of the downtown area. How can the Corps planner use this information to enhance the efforts of both agencies to the benefit of the community? The answer lies in a collaborative study among the Corps, the community, and the non-Federal sponsor.

Using the National Environmental Policy Act (NEPA) Process. In enacting NEPA, Congress recognized that nearly all Federal activities affect the environment in some way and mandated that before Federal agencies make decisions, they must consider the effects of their actions on the quality of the human environment. NEPA assigns to the Council on Environmental Quality the mission of ensuring that Federal agencies meet their obligations under the Act. The challenge of harmonizing our economic, environmental and social aspirations has put NEPA at the forefront of our nation's efforts to protect the environment.

The NEPA process provides a mechanism for recognizing historic, cultural, and environmental resources within the study area including Indian trust and sacred sites that are of Federal interest. Federal interest is also exhibited with cultural and historical designations of buildings and places and national wildlife areas, parks, seashores, and scenic routes among others. An inventory of historic

places and public spaces within the study area gives an indication of established Federal interest.

Elicit the help of your non-Federal Sponsor. Nowadays the non-Federal sponsor shares study costs and is likely to take an active role in plan formulation activities. The non-Federal sponsor can help identify and introduce other community leaders who know the area and who may know of problems that can be best solved within a collaborative and comprehensive approach.

C. Partnering.

A reference to partnering is found in the following IWR report: Partnering Guide for Civil Missions, IWR Pamphlet 98-SDR-P-7, April, 1998. It is also useful as an introduction to partnering for other agencies, local sponsors, groups or individuals considering entering into a partnering agreement with the Corps. It describes collaborative processes that can be used during the various phases of Civil Works projects involving potential partners in the development, implementation, and operation of Civil Works projects. The guide provides information for differing levels of involvement from partnering with other Federal agencies to partnering with local communities, team formation, dispute resolution, monitoring progress, and case examples.

> As used in the Partnering Guide for Civil Missions, partnering is defined as a collaborative process used by Corps personnel to work with communities, interest groups, local sponsors, contractors and other Federal, State, and local agencies.

Other helpful tools that describe the process and assist in the success of mutual endeavors are found at the following links:

Shared Vision Planning

Regional Visions for Integrated Watershed Management

Podziba, Susan, Deciding Whether or Not to Partner Small Projects: a Guide for U.S. Army Corps of Engineers Managers, IWR Pamphlet 95-ADR-P-6, August, 1995

Ayers, Donna B., et al., Overview of Alternative Dispute Resolution (ADR): A Handbook for Corps Managers, IWR Pamphlet 96-ADR-P-5, July, 1996.

D. Public Involvement

The P&G require public involvement. E.O. 12372, "Intergovernmental Review of Federal Programs," and 33 CFR 384, "Intergovernmental Review of the Department of Army Corps of Engineers Programs and Activities," require that the Corps coordinate planning programs with State and local governments. As a result, the Corps is required to coordinate with State agencies and the Governor or his designated agency, interested and affected agencies, groups and individuals. The National Environmental Policy Act (NEPA) also solicits

public involvement through its requirement for public disclosure of environmental impacts.

There is no one "public" in the sense of public involvement. There are in fact many publics when conducting a water resource planning study. Involving these many publics may involve various techniques—public meetings, informal workshops and information sessions, websites, presentations to civic groups, and public affairs media releases. Public involvement permeates all aspects of the Corps planning process. The Corps participation in collaboration with other Federal, State, and local agencies does not negate its requirement for public involvement.

> Public involvement is a process by which interested and affected individuals, organizations, agencies, and government entities are consulted and included in the decision-making process of a planning effort. Public involvement is intended to both inform the public and to be informed by them by actively soliciting public response regarding their problems, needs, and values; ideas about solutions; and reactions to proposed solutions to problems.[13]

1. Public Participation in Decision-making

When we think of collaboration and partnering, we often think in terms of Federal, State, and local governmental agencies joining forces to address a specific objective. However, almost all governmental agencies also seek to invoke input from the public as a matter of operational procedure and legal requirement. Input from citizens groups is essential to the success of project planning but how that input is gained can be a source of legal problems if proper methods are not followed. For ongoing involvement of interested citizens, it is important to be aware of the Federal Advisory Committee Act (FACA) and to consult District Counsel prior to action. Follow the hyperlink for more information regarding FACA .

Executive Order (E.O.) 13352, August 26, 2004, Facilitation of Cooperative Conservation. The purpose of E.O. 13352 is to ensure that the Departments of the Interior, Agriculture, Commerce, and Defense and the Environmental Protection Agency implement laws relating to the environment and natural resources in a manner that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in Federal decision-making, in accordance with their respective agency missions, policies, and regulations. Cooperative conservation means actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among Federal, State, local, and tribal governments, private for-profit and nonprofit institutions, other nongovernmental entities and individuals. The Chairman of the Council on

[13] Yoe, Charles E., and Kenneth D. Orth, Planning Manual, IWR Report 96-R-21, Institute for Water Resources, November 1996

Environmental Quality convenes periodically a White House Conference on Cooperative Conservation to facilitate the exchange of information and advice relating to cooperative conservation and means for achieving the purposes of the order. Conference participants are encouraged to provide their individual advice and are to avoid engaging in collective judgment or consensus advice or deliberation (anti FACA language).

2. A Cautionary Statement

When involving the public in Corps planning activities, planners must take care not to confer the decision-making authority to any individual or group. The authority for decision making rests with the District Commander or higher authority within the organization and, therefore, cannot be transferred. The study team involves the public in the creation of a recommendation to the District Commander. The responsibility of making a decision based on the recommendation rests with the District Commander.

References for public involvement are found at these links:

ER 1105-2-100, Appendix B, "Public Involvement, Collaboration and Coordination," Planning Guidance Notebook, Washington, D.C.: Department of the Army, U.S. Army Corps of Engineers, 22 April 2000.

"Public Involvement and Team Planning" training course, Planning Capabilities Core Curriculum

Public Involvement, Planner's Main Library, Planner's Resource Web, U.S. Army Corps of Engineers

Public Involvement, IWR Library, search on "public involvement"

Section III
Identifying the National Interest Plan using Collaboration and the Planning Process

A. Highlights

Some highlights of how current guidance impacts the Corps planning process follow:

* Current planning guidance re-emphasizes the importance of taking advantage of opportunities to collaborate with other Federal and non-Federal entities in the formulation of Corps projects. The objective is to reduce the current fragmentation of government and to efficiently use Federal resources.

* Collaborators can be participants in plan formulation. Collaborators in the sense of current planning guidance are Federal, State, and local agencies and institutions that possess financial and other resources with which to actively participate in a study and that can commit those resources to the process. Collaborators are not just non-Federal sponsors. Non-Federal sponsors are partners with the Corps and can participate in collaboration with other government entities if they choose.

* Current guidance applies to Corps and non-Federal sponsor cost-sharing of studies and projects. Collaborators will fund their portions of the projects while the Corps and the non-Federal sponsors will fund their portions. Some opportunities to share joint costs could arise as a result of the collaborative planning process.

* Purposes other than traditional Corps purposes can now be included in studies as stated objectives. These objectives can be other Federal, State, and local interests as expressed by collaborators, by the non-Federal sponsor, or by other stakeholders. The scope of the interest, however, should be of national importance.

* Contributions to social well-being, such as life, health, and safety, and regional economic development can now be included as study objectives and components can be formulated with these objectives in mind. These objectives need not necessarily be the same objectives as those of the collaborators.

* Plans can be developed that have not only Corps components, e.g., conveyance measures, navigation channels, restoration sites, but also collaborator components, e.g., urban renewal, transportation improvements, that meet the objectives of the study. Collaborator

components can be spatially proximate to Corps components and function either separately or in a systemic way with Corps components. Or components can be formulated that address both collaborator and Corps objectives to serve multiple purposes.

* Plans required to be formulated are:

  No Action;

  Locally Preferred Plan, if requested by the non-Federal sponsor;

  National Interest Plan, a plan developed in collaboration with other Federal and non-Federal entities; can be traditional Corps plans (NED Plan, NER Plan, or NED/NER Plan), or plans reflecting other Federal agency authorities/interests/contributions, or any combination of such plans; and

  Non-structural Plan(s).

* Collaborators may formulate their own components to address their objectives. Collaborators will be working toward meeting their interests, which may or may not be shared Corps objectives.

* Collaborator components may not be subjected to the same evaluation criteria if they are independent and serve only collaborator purposes. The economic justification process applies to Corps components as directed by P&G. Only the U.S. Army Corps of Engineers and other specified water resource development agencies are required to conform to the evaluation criteria directed by P&G. Non-Federal cost-sharing requirements apply to Corps components and not to collaborator components.

* Recommendation for plan selection will be based on “net beneficial effects” after considering all plan effects, both positive and negative, in the four accounts.

* Evaluation, display, and comparison of the Corps components will be made across all four P&G accounts: NED, EQ, RED, and OSE.

A plan other than an NED Plan can be recommended so long as the report explains the overriding reasons for selecting another plan and a waiver is requested from ASA(CW) at the Alternatives Formulation Briefing, or shortly thereafter, but before the draft report is released.

B. The Six-step Planning Process, Collaboration, and the National Interest Plan

The P&G recommend the following **iterative** six-step planning process to solve water resource problems of any size or magnitude. This process remains the fundamental framework for COE planning.

* Specify water resources problems and opportunities
* Inventory and forecast conditions
* Formulate alternative plans
* Evaluate effects of alternative plans
* Compare alternative plans
* Select recommended plan

This handbook provides only a general overview of the Corps planning process. The planning process is described here in order to demonstrate how collaboration can fit into the process at virtually any step.

1. Step1. Identify water resources problems and opportunities in the study area. Identify goals and objectives of the study.

> "Without a clear statement of the problems to be solved or the opportunities to be seized, there is no rationale, no reason for planning."[14]

The Problem Statement. The most important action taken during the planning process is the initial expression of the problem. The problem statement serves as guide and reminder throughout the planning process of the team's purpose. Because of its importance, the problem statement should be crafted with care since it will be the justification for all subsequent study activities.

Collaboration and integrated water resources planning allows for the expression of the problem in the context of a more encompassing framework.

Typical Corps problem statement: "Flooding occurs in an urban area."
More inclusive problem statement:
"Flooding occurs in an urban area. The impacted area of the stream's floodplain covers a diverse spectrum of the city, ranging from new suburban development in the upper reaches of the stream to older, degraded neighborhoods downstream."

This expanded problem statement reveals added insight into the dynamics of the study area and suggests that other problems exist in the area besides flooding.

[14] Yoe, Charles E., and Kenneth D. Orth, Planning Manual, IWR Report 96-R-21, Institute for Water Resources, November 1996.

The expression of the problem, goals, and objectives of the study is a group effort and can occur during the scoping process or at any other appropriate time during the study phase. Collaborators should bring to the study their knowledge of the study area and their view of the problem. They should contribute to developing the problem statement and help construct the shared vision for the study along with other stakeholders, including the non-Federal sponsor.

Establish goals and objectives. Once the problem statement has been developed, the next step is to establish the goals and objectives of the study, answering the question, "What is it that the team hopes to accomplish during the study?" How will what the team produces impact the problem as stated?

The expression of a study's goals and objectives serves to answer the question of the study's intention. Building on the previous example of a flooding problem, an obvious goal would be to "reduce flood damages." With National Ecosystem Restoration (NER) as another mission, the team would add another goal to "restore ecological values to the stream."

Typical Corps Objectives:
- Reduce flood damages in an urban area.
- Restore ecological values to the stream.

Current collaboration guidance allows for other goals and objectives besides NED and NER to be added to the study. An example follows of other Federal interest goals that could be added to the goals of "reducing flood damages" and "restoring ecological values to the stream:"

Added Study Goals:
- Reduce residual flood risk to the population.
- Improve the quality of existing neighborhoods.

The previous examples are but two possible goals that diverge from traditional Corps objectives. The planning process does not prohibit the inclusion of project goals and objectives that address other interests. **The problems and opportunities statement of a study allow planners to look holistically at an area for any potential to address multiple, interrelated problems through collaboration with other interested parties.** Those interests will be decided by collaborating Federal and State agencies, by the study team, of which the non-Federal sponsor is a part, and by other stakeholders. Incorporating objectives of other agencies does not negate the requirement for an NED or NER objective but allows other interests to be addressed.

The importance of this first planning step cannot be overly emphasized. Ideally, the collaborating partners will be actively participating in the study effort, contributing resources, expertise, time, and energy. Defining the problem and establishing the objectives of the study in concert with collaborators are the

linchpins of all future activity. Clearly defining the problem will help in determining the type and extent of effort required, its resource requirements, and how those efforts will be allocated among the study participants.

2. Step 2. Collect data on the problems identified.

The second most important step in the planning process is establishing the "without project" condition, now and during the project life. The "without project" condition establishes the planning environment in which action and impacts are likely to occur. This step also establishes the "most likely" future condition in the absence of Federal action and it sets the base against which project effects are gauged.

Since collaborative planning involves actively pursuing goals and objectives of collaborators as well as Corps objectives, the planner should develop a profile of the study area that will function as the backdrop against which all proposed plans can be adequately evaluated with regard to a full accounting of project impacts. The intent is to fully describe the effects of plan implementation so that unintended negative consequences can be avoided. As an added benefit, additional opportunities may present themselves that plan formulation can address.

In order to accomplish a more thorough description of the study area, current guidance now requires the metrics for Other Social Effects (OSE) and Regional Economic Development (RED) be considered when describing a plan's effect. It is impossible to gauge a plan's impact on these parameters without knowing their baseline "without project" condition. The metrics for OSE and RED are discussed in greater detail in a subsequent part of this handbook.

The "Future Without Project" Condition. The "future without project" condition will describe essential elements in terms of their future condition in the absence of Federal action. This Federal action is not limited to Corps project implementation but may include other aspects of a future condition based on the participating collaborators. As noted in the example of the Urban River Initiative between the Corps and the Environmental Protection Agency (EPA), the expression of future water quality parameters in the absence of EPA or Corps actions would be appropriate. Regardless of which agency is involved in the collaboration, a thorough description of the study area is requisite to impact assessment.

Period of Analysis. Collaborating with other Federal agencies may require that differing periods of analysis and project lives be considered. P&G recommend gathering information about potential future conditions over the period of analysis to show how changes in economic and other conditions are likely to impact problems and opportunities. It is during this period of analysis that Corps projects are evaluated for their performance. Collaborators' planning

may involve a period of analysis that reflects their specific analytical interest and may differ from a traditional Corps period of analysis.

The Corps' period of analysis begins in the first year, the base year, that benefits of the project are realized and usually extends throughout the project life. Generally the Corps uses a period of analysis that corresponds to the life of its proposed project. This may or may not correspond to collaborators' periods of analysis. It will be incumbent upon the study team to decide how the Corps' period of analysis and project life and the collaborator's analytical framework fit together so that planning can be coordinated and benefits be realized.

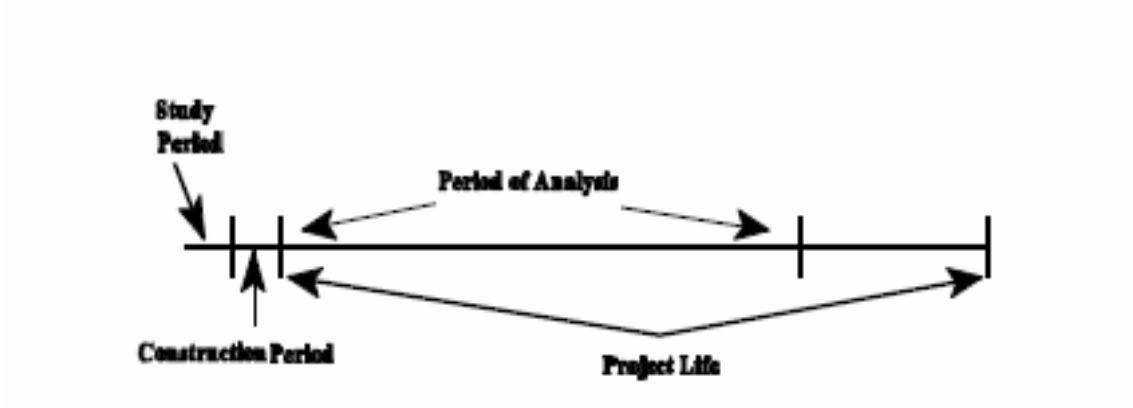

Figure 1. The Planning Horizon

Scenario Planning. Scenario planning can be useful to the collaborative process especially when multiple objectives are being addressed and considerable uncertainty surrounds project outputs with regard to expected performance over time. Making predictions about an uncertain future is difficult under any circumstance, but especially when projecting 50 years hence. In the absence of Federal action, the study area will change—capturing the nature, direction, and magnitude of that change is daunting and fraught with uncertainty. Recognizing the uncertainties with which the planner works can help alleviate the stress associated with "getting it right" with just one estimate of a future condition.

Scenario planning is a method for learning about the future by understanding the nature and impact of the most uncertain and important driving forces affecting our future. It is a collaborative group process which encourages knowledge exchange and development of a mutual deeper understanding of central issues important to the future of the planning endeavor.

The goal of scenario planning is to craft a number of diverging stories or "future without project" conditions by extrapolating uncertain and heavily influencing driving forces. The stories, together with the work of getting there,

have the dual purpose of increasing the knowledge of the area of concern and widening the collaborators' perceptions of possible future events.

The scenario planning method is most widely used as a strategic management tool in business, but this and similar methods have been used for enabling other types of group discussion about a common future. When applying scenario planning, the "future without project" condition would not necessarily be one labeled "most likely future." Rather, multiple futures might be formulated, each with a different outcome based on significant driving forces. By looking at a range of possible futures, a plan may be formulated and recommended that has a higher likelihood of success over the range of futures considered rather than hinging success on a more narrowly defined "most likely" future condition.

3. Step 3. Develop alternatives to solve the problems.

> Formulation is the process of building plans that meet planning objectives and avoid planning constraints. Plans may be composed of one or more management measures or components, either structural or nonstructural, activities or policies. Features are physical or functional characteristics of components. Generally components are designed to address specific problems in specific areas. Components can be incrementally combined into a system representing an alternative plan.

The following plans are now required to be formulated:

1. No Action;

2. Locally Preferred Plan, if requested by the non-Federal sponsor;

3. National Interest Plan, a plan developed in collaboration with other Federal and non-Federal entities; can be traditional Corps plans (NED Plan, NER Plan, or NED/NER Plan), or plans reflecting other Federal agency authorities/interests/contributions, or any combination of such plans; and

4. Non-structural Plan(s).

Plans do not have to fit within the authority of the Corps. Depending on the collaborating partners, proposed actions can take various forms. The plans may be composed of separable components or combined components that achieve multiple objectives. It will be incumbent upon the collaborating partners to build plans that satisfy their goals and objectives.

Components addressing OSE and RED objectives that reflect concerns of national interest can be included in the Corps plan to meet stated objectives.

Engaging in scenario planning may be one way to bridge the process gap when working with collaborators, especially when dealing with a deeply uncertain future. In some circumstances it might be appropriate to formulate plans based on a range of possible future conditions.

Plan components will be formulated that address Corps objectives and collaborator objectives. Components may individually address a specific objective but still be located physically proximate, such as within a watershed. Components may or may not influence one another. Components may also be formulated that are separate but interdependent—that rely on their synchronous performance to realize all the intended benefits of both or each. Also components may be formulated that contribute to multiple objectives.

The following graphics illustrate these possibilities:

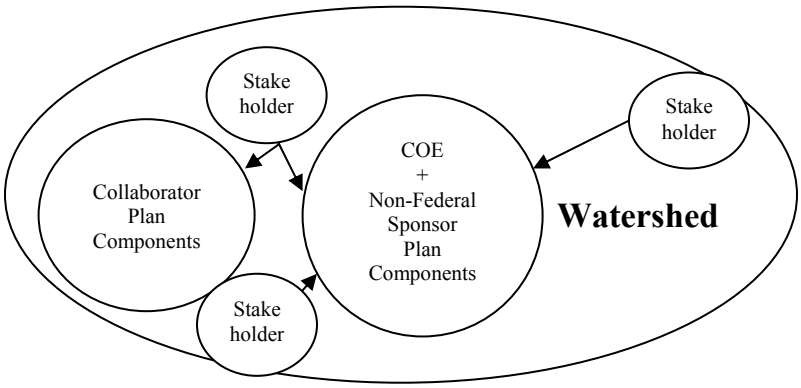

Figure 2. Components are not influencing one another and do not share features but are nearby.

In Figure 2, the formulation and evaluation of multipurpose plans with functionally and physically **in**dependent purposes require that the Corps components, serving a Corps purpose, be optimized and justified. In this scenario, the Corps plan will be developed with components that are independent of collaborator components and plans. The collaborator will formulate a plan meeting their stated objectives and following their own policies and procedures.

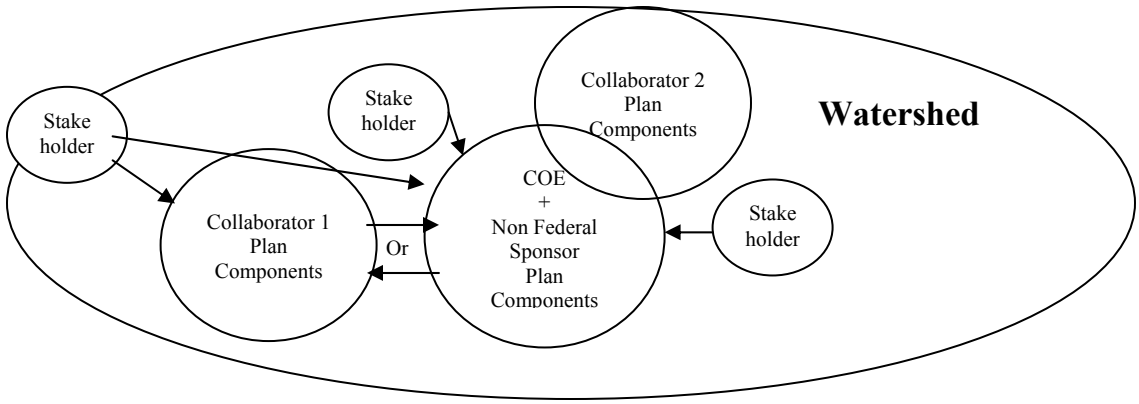

Figure 3. Components are influencing one another and may or may not share features. Influence may be in either direction or both directions.

In Figure 3, components proposed by the Corps and the collaborators share features and are physically or functionally **inter**dependent. Two scenarios are possible, one in which tradeoffs are not required and another which requires that tradeoffs be made.

Tradeoffs not required. The first scenario does not require trade-offs. By working together the study team, which includes the Corps, non-Federal sponsor(s), and collaborators, develops components that address multiple objectives whereby the objectives of both the collaborators and the Corps can be addressed with the same component(s), such as with the shared features of Collaborator 2 and COE + non-Federal sponsor components in Figure 3. In this scenario increases in the outputs for one purpose or objective do not diminish the outputs of another purpose or objective. Gaining more units of one type of output does not result in losing units of another output. Also, both collaborator and Corps components may be formulated to enhance the performance of each in a synergist way with increased outputs of both as the scaling increases. The outputs would be allowed to increase until the collaborators determine the upper limit of outputs required to meet their objectives or the Corps component is optimized for efficiency. An example of this would be to add local development features such as landscaping that follows an urban stream which is modified for flood damage reduction and open space.

Tradeoffs required. In the second scenario, where components are interdependent such as with Collaborator 1 and COE + non-Federal sponsor components of Figure 3, trade-offs must occur for the realization of increases in outputs of either purposes or objectives. Increases in outputs for one purpose or objective diminish the outputs for another purpose or objective. It is important to recognize how and what outputs serve stated objectives and what trade-offs must occur to achieve stated goals.

4. Step 4. Evaluate the effects of the alternatives.

The fundamental evaluation process for Corps projects did not change with the issuance of collaboration guidance. Corps components to collaborative projects will be evaluated based on stated objectives and current Corps guidance.

P&G established four accounts to facilitate evaluation and display of the effects of alternative plans. These accounts are: national economic development (NED); environmental quality (EQ); regional economic development (RED); and other social effects (OSE). These four accounts encompass all significant effects of a plan on the human environment as required by the National Environmental Policy Act of 1969 (NEPA)[15]. They also encompass social well-being as required by Section 122 of the Flood Control Act of 1970.[16]

[15] 42 U.S.C. 4321 *et seq*.
[16] P.L. 91-611, 84 Stat. 1823

Evaluate across the 4 accounts. The four accounts defined by P&G, 1983 are as follows:

- "The national economic development (NED) account displays changes in the economic value of the national output of goods and services;
- The environmental quality (EQ) account displays nonmonetary effects on significant natural and cultural resources.
- The regional economic development (RED) account registers changes in the distribution of regional economic activity that result from each alternative plan. Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output, and population.
- The other social effects (OSE) account registers plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts."[17]

All Corps plans will be evaluated, displayed and compared based on the full range of the plans' effects across all four accounts. The evaluation framework for NED and EQ analysis of project features and their combinations into alternative plans is detailed in existing guidance. Components will be justified based on their benefit-to-cost ratio or cost effectiveness-incremental cost analysis (CE-ICA) analysis.

Measuring the social and regional effects of civil works projects is not new to the Corps or to other Federal agencies. The Corps of Engineers conducted social impact assessment and regional economic evaluations after passage of the Flood Control Act of 1970 using Section 122 parameters. The publication of implementation procedures for NEPA[18] included the human environment as a consideration for effects assessment. Social well-being parameters and RED factors are noted in ER 1105-2-100, Amendment 1, 30 June 2004, Appendix D-8, and are listed below:

- Urban and community impacts
  - Effects on real incomes
  - Effects on employment distribution, especially the share to minorities
  - Effects on population distribution and composition
  - Effects on fiscal condition of the State and local sponsor
- Effects on educational, cultural, and recreational opportunities
- Effects on security of life, health, and safety
- Displacement of people, businesses, and farms

[17] U.S. Water Resources Council, Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, Washington, D.C.: U.S. Government Printing Office, 10 March 1983

[18] Council for Environmental Quality, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR 1500-1508, U.S. Government Printing Office, 29 November 1978.

* Long-term productivity effects
* Effects on emergency preparedness
* Other relevant effects, which may include the following:
    - Community cohesion, diversity
    - Aesthetics
    - Community services, infrastructure
    - Tax base and property values
    - Factors specific to the study area

Metrics for social well being and regional economic development pertain to those aspects of society that contribute to quality of life. When incorporated within the objectives of resource planning, the concept implies that the goals of technological progress should be tempered with humanistic concerns for equality, justice, and a generally high quality of life for all Americans. [19] The general goal of the Other Social Effects (OSE) account is to enhance the development of individual capability, health, self-reliance, and opportunities for individual choice.[20]

The metrics for evaluating regional economic development and social effects are complex and driven by the unique aspects of the study area under analysis. Developing an accurate impact assessment requires that the analyst have not only a good understanding of the proposed action and how that action will be implemented but also a good understanding of the dynamics of the area in which the action will occur. Context is very important in considering OSE effects with regard to significance. For example, population growth might be viewed positively within an economically depressed area. In another area growth might stress the community's ability to provide for necessary services and infrastructure. Public input is vital to understanding the social and cultural value system of the impact area. It is important to gather information from a variety of sources to fully comprehend the social character of the study area.

Unintended local consequences or negative effects can be a by-product of Corps plan implementation. OSE and RED metrics allow for the consideration of a wide variety of effects so that unintended consequences can be identified and avoided, if possible. Now that OSE and RED interests can be included as study objectives, opportunities exist for enhancement of these interests, not just avoiding a project's negatives impacts to RED and OSE. And too, collaborators' interests may very likely be reflected in the RED and OSE accounts.

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[19] Liu, B., Quality of Life Indicators in U.S. Metropolitan Areas, 1970: A Comprehensive Assessment, Washington, D.C.: Washington Environmental Research Center, U.S. Environmental Protection Agency, May, 1975.

[20] Guseman, Patricia, et al., Profile and Measurement of Social Well-Being Indicators for Use in the Evaluation of Water and Related Land Management Planning, College Station, TX: Texas Transportation Institute, Texas A&M University, June,1978.

Attributes of RED and OSE variables are presented in "Review of Guidance and Procedures for Regional Economic Development and Other Social Effects," August, 2006. This reference presents a general discussion of variables and assessment tools as well as resources available to the analyst.

Evaluate using the 4 criteria. P&G, 1983, also suggests the use of four evaluation criteria of efficiency, effectiveness, acceptability, and completeness in the screening of alternative plans. Those criteria are defined in the Planning Manual[21] as follows:

> Completeness: "Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects."[22] To establish completeness of the plan, it is helpful to list those factors beyond the control of the planners that are required to make the plan effects a reality. If a plan's effects, like project benefits, will not be realized unless there is a strong international economy, dredging of private berths, and relatively peaceful conditions in the oil-producing nations, these factors must be identified. The plan is not complete unless these conditions are met.
>
> Effectiveness: "Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities."[23] An effective plan makes a significant contribution to the solution of some problems and achieves some opportunities. The bottom line for this criterion is "Does it do the job?"
>
> Efficiency: "Efficiency is the extent to which an alternative plan is the most cost-effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment."[24] Efficiency refers to the allocation of resources and opportunity costs foregone, not just amount of dollars spent. The question posed here is "Is there a cheaper way to accomplish the same planning objectives or to derive the same level of outputs?"

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[21] Yoe, Charles E. and Kenneth D. Orth, Planning Manual, IWR Report 96-R-21, Institute for Water Resources, November 1996.
[22] Section VI.1.6.2(c)(1), Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, U.S. Water Resources Council, Washington, D.C.: U.S. Government Printing Office, 10 March 1983
[23] Section VI.1.6.2(c)(2), Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, U.S. Water Resources Council, Washington, D.C.: U.S. Government Printing Office, 10 March 1983.
[24] Section VI.1.6.2(c)(3), Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, U.S. Water Resources Council, Washington, D.C.: U.S. Government Printing Office, 10 March 1983

Acceptability: "Acceptability is the workability and viability of the alternative plan with respect to acceptance by State and local entities and the public and compatibility with existing laws, regulations, and public policies."[25] There are two primary dimensions to acceptability. One we call implementability, meaning is it feasible in the technical, environmental, economic, social, and similar senses? The other is the satisfaction it brings. Acceptability can also be defined as the extent to which a plan is welcome or satisfactory in a very subjective sense.

Collaboration with others can contribute to achieving these evaluation criteria. Collaborating can involve other agencies who can contribute to making the plan more complete, which in turn will enhance the effectiveness and efficiency of plans. Effectiveness can be achieved across a wider range of metrics which may include metrics introduced by collaborators. Accomplishing tasks to solve problems across an array of collaborators may lead to more efficient investments of resources. And also collaboration contributes to acceptability by incorporating multiple interests in the decision-making process or by creating an atmosphere that allows for consensus building.

Evaluate based on Uncertainties. Another way to evaluate alternatives may come from the use of scenario planning. Rather than selection based on maximized outputs, a plan might be identified that performs most successfully across the recognized uncertainties that arise from the various scenarios created by the collaborating team.

Evaluating the Collaborator's Plan. The collaborator's plan will not necessarily be subjected to the same evaluation criteria that are required for Corps project justification or the display of effects across the 4 accounts. However, when working in tandem with other Corps components, the contributions of a collaborator's plan to overall achievement of objectives should be recognized.

Categorical Exemptions. Current Corps guidance allows plan formulation to be suspended and a plan recommended so long as the non-Federal sponsor identifies a constraint to a project's physical size or a financial constraint and if the net benefits are increasing as the constraint is reached. Oftentimes the non-Federal sponsor requests the exemption to the NED with preference for the smaller scale as a Locally Preferred Plan.

"If the non-Federal sponsor identifies a constraint to maximum physical project size or a financial constraint due to limited resources, and if net benefits are increasing as the constraint is reached, the requirement to formulate larger scale plans in an effort to identify the NED plan is suspended. The constrained plan may be recommended. If the NED plan is identified at a physical size or

[25] Section VI.1.6.2(c)(4), Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, U.S. Water Resources Council, Washington, D.C.: U.S. Government Printing Office, 10 March 1983

cost which is less than the constraint, the NED plan requirement is satisfied and the NED plan should be recommended."[26]

A smaller or larger scale plan than the NED plan could also be developed to coincide with collaborators' objectives. If the plan proposed to be recommended is larger in scale than the NED plan, an exception from the ASA(CW) must be obtained. An essential element of the analysis of the recommended plan is the identification of trade-offs and opportunities foregone as a result of implementation of the different scale plan. The planning report will explain the rationale and basis for selection considering the beneficial and adverse effects across all four accounts and will recognize the collaborative effort and contribution of both COE and collaborator components.

5. Step 5. Compare alternatives.

The study team in collaboration with study partners and stakeholders will use the available data, analyses, input from peer review, and professional judgment to evaluate and designate candidate plans for selection. The goal is to identify the best performing plans in terms of meeting objectives at reasonable costs that "net" more positive impacts than negative ones.

"*Plans may be judged, on balance, to have net beneficial effects when, given the full range of effects in all four accounts, no other alternative plan or scale has a higher excess of beneficial effects over total adverse effects."*[27]

Current guidance states that after considering a plan's beneficial and adverse effects across all four accounts, the plan may be a candidate for selection if it has, on balance, (based on analyses and collaborative judgment) net beneficial effects. The basis for selection will consider the beneficial and adverse effects in all four accounts. Some effects are quantitative while others are qualitative therefore making the literal derivation of "net" effects difficult. Corps planners are familiar with net excess benefits for NED analysis and cost-effective/incremental cost analysis metrics for NER and EQ analysis. The units of RED may take the form of direct and indirect income or man-years of employment. The impacts to OSE will most likely be expressed in terms of changes in duration and intensity to social variables and will be less precise in expression. Using qualitative expressions, such as positive or negative, greater or lesser, to describe social effects parameters will many times be the only way to display some effects to social variables for plan comparison.

Identifying Net Beneficial Effects. Traditionally impacts across the four accounts are displayed in an effects matrix, showing both quantitative and qualitative impacts of each alternative plan. In this way trade-offs between effects can be

[26] Department of the Army, U.S. Army Corps of Engineers, "Planning Guidance Notebook," ER 1105-2-100, E-3.b.(5), 22 April 2000.
[27] Department of the Army, U.S. Army Corps of Engineers, "Planning in a Collaborative Environment," EC 1105-2-409, Washington, D.C., 31 May 2005

seen more clearly. An example of a current effects matrix is available from the Mississippi Coastal Improvement Program Interim Report, 2006.

Experience has shown that there are times when the NED Plan is identified only to gauge the level of traditional cost-sharing with little expectation for implementation. However when consideration is given to OSE/RED and other benefits, a plan that addresses this larger mix of benefits in addition to NED and NER benefits can be a better Federal plan overall and an implementable one. This is the **National Interest Plan**. OSE and RED benefits can also be useful when evaluating projects based on the "completeness" and "acceptability" evaluation criteria.

An NED or NER plan must still be identified as the standard for economic and engineering efficiency. Another plan may be selected if, however, the effects matrix supports the conclusion that positive effects can be gained when evaluating across the four accounts. That plan would be identified as the **National Interest Plan (NIP)** and would support benefits for social well-being, regional economic development, environmental quality and/or other objectives identified by the collaborators as well as to NED. The NIP will be justified based on benefits exceeding separable costs for the Corps components and its "net" benefits. The "net" benefits will be derived from the 4 accounts where positive effects outweigh negative effects. No other alternative plan will have a higher excess of beneficial effects over total adverse effects.

6. Step 6. Select a plan for recommendation or decide to take no action.

A plan can be recommended for implementation based on a full evaluation of its performance across the four P&G accounts and upon the professional judgment of the study team and collaborators with input from peer review and stakeholders.

Corps components included in the selected plan must pass the justification test, that is, benefits must exceed separable costs. The Corps component should also be optimized for outputs based on the Corps objectives in preparation for a trade-off analysis.

The National Interest Plan (NIP). Current guidance requires a full display of plan effects and the acknowledgement that the Federal interest may be expressed in terms other than NED and NER. The NED or the NER Plans will be presented and displayed. However, the end result could be a collaborative **National Interest Plan** that could be a deviation from the NED or NER Plans based on other criteria, such as OSE, RED or other collaborators' objectives. Deviations from the NED Plan are allowed when other Federal interests are taken into account and a clear rationale for deviation from the NED is presented with supporting documentation. Trade-offs that occur should be fully-disclosed by laying out benefits foregone and benefits gained. An ASA(CW) exception is still required if the Recommended Plan is not the NED or the NER Plan.

Collaborative planning may produce a National Interest Plan with Corps' components as well as components to be implemented by other agencies. The following example demonstrates how Other Social Effects (OSE) can be incorporated into plan formulation.

Example of Other Interests

Plan 1 outputs: $100 net excess NED benefits + (+ 5 ordinal score for OSE)
Plan 2 outputs: $100 net excess NED benefits + (-1 ordinal score for OSE)
Plan 3 outputs: $70 net excess NED benefits + (+ 10 ordinal score for OSE)
This example displays outputs of each plan that represent net excess NED benefits and effects based on Other Social Effects (OSE) variables. Plan 3 trades-off net excess benefits for increases in quality of life attributes and could be identified as the National Interest Plan since it has positive outputs of both NED and OSE. Plan 1 could also be the National Interest Plan if the study team decides, along with peer review and other stakeholder input, that the plan attains the greatest benefits over adverse effects. The correct answer depends on the study objectives and how those objectives are met by the formulated plans.

Trade-off Analysis across the Four P&G Accounts. Trade-off analysis is the procedure used by the Corps to identify the potential gains and losses associated with producing a larger or lesser amount of a given output or outputs. The results of trade-off analysis are used in the formulation, evaluation, comparison, and selection of the recommended plan. A matrix display of the four accounts will help visually summarize the trade-offs across the alternative plans considered. Trade-off analysis also helps identify the plans that best meet the multiple criteria defined for evaluation. It is important to recognize the trade-offs required to meet specific objectives.

The key to making a judgment is in identifying and fully describing the best reasonable mix of beneficial effects at a reasonable cost.[28]

The following references are available to assist the planner:

Yoe, Charles, Trade-off Analysis Planning and Procedures Guidebook, IWR 02-R-2, April 2002.

Capan, Donald T. et al., Trade-off Analysis for Environmental Projects: An Annotated Bibliography, IWR 95-R-8, August 1995.

[28] Department of the Army, U.S. Army Corps of Engineers, "Planning in a Collaborative Environment," EC 1105-2-409, Washington, D.C., 31 May 2005

Section IV
Cost-Sharing the Results of the Collaborative Process to Produce a National Interest Plan

Cost sharing is the process of apportioning total project financial costs among purposes served by a project. Financial costs are implementation outlays, transfer payments such as replacement housing assistance, and the market value of in-kind contributions. Financial costs are allocated to those purposes for which the project is formulated.

Cost sharing usually occurs between the Corps and the non-Federal sponsor or multiple sponsors. Collaborative planning introduces the probability of multiple non-Federal sponsors and Federal collaborators especially for studies in which multiple purposes are pursued over a large area such as a watershed. Multipurpose studies and projects are cost shared in accordance with the cost sharing policies applicable to each project purpose required. Before determining the required cost sharing for projects, an allocation of total project costs to each purpose must be accomplished.

Current planning guidance states that a plan's individual project purposes or other categories of effects need not be individually justified. However,

a purpose's separable costs must be individually justified.

Separable cost for each purpose in a plan is the difference in financial cost that would result if that purpose were excluded from the multi-purpose plan.

Current authorities and policies including cost sharing requirements will govern Corps participation in collaborative projects. When the Assistant Secretary of the Army for Civil Works (ASA(CW)) grants an exception to the selection of the NED plan, the costs for the granted exception is shared on the same percentage basis as the NED plan. Recommended plans smaller or less costly than the NED plan will normally be granted an exception to NED plan selection, and cost shared on the same percentage basis as the NED plan.

It is expected that Federal, State, and local agency collaborators would be able to finance those components of the collaborative project that address their study objectives. Those components which address Corps objectives, and joint costs, would be cost-shared with the non-Federal sponsor according to guidance. ER 1105-2-100, Appendix E-63 provides detailed guidance for and examples of cost allocation among purposes serving a multipurpose project.

The sharing of costs of components serving multiple purposes among the Corps, the non-Federal sponsor, and collaborators will present issues with regard to proportionate share, scheduling, and funding. Each collaborative project will produce its unique situation with regard to cost-sharing. Sequencing, funding

sources, and budget cycles of other agencies will challenge the success of project implementation.

The report will clearly present the responsibilities of the various parties and the funding they will contribute. Appropriate agreements must also be proposed to assure that the necessary investments and actions to achieve the expected benefits are agreed upon. [29]

[29] Department of the Army, U.S. Army Corps of Engineers, "Planning in a Collaborative Environment," EC 1105-2-409, Washington, D.C., 31 May 2005

Section V
Summary

Collaboration is emerging as an important activity within the Corps of Engineers. This handbook comprises the initial effort to guide the field in addressing a collaborative planning perspective that is consistent with the Corps' Strategic Plan for the Civil Works Program for FY 2004-2009 and with current planning guidance. While the Corps' Strategic Plan addresses several aspects of planning, this handbook has focused on the Corps' collaboration with other Federal, State, and local agencies to better address problems in a more holistic fashion. By addressing water resource problems within the context of an area's full dynamic human and natural environment, the Corps planner can contribute to a more efficient use of scarce resources with the identification of the National Interest Plan that reflects a broadened Federal perspective. Analyzing problems and proposed remedies in terms of the 4 accounts of National Economic Development (NED), National Ecosystem Restoration (NER), Regional Economic Development (RED), and Other Social Effects (OSE) will better capture the full impact of Federal actions and also reveal opportunities to address a broader range of Federal interests.

The format and nature of this handbook was designed to be dynamic so that additional information can be easily added with links and text as new literature and case studies emerge.

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Table 1
Examples of Federal Government Programs

DEPARTMENT	AGENCY	OBJECTIVE
DEPT OF DEFENSE	US ARMY CORPS OF ENGINEERS	National Economic Development
DEPT OF HOMELAND SECURITY	FEDERAL EMERGENCY MANAGEMENT AGENCY	Lead America to prepare for, prevent, respond to, and recover from disasters.
INDEPENDENT AGENCY OF THE EXECUTIVE OFFICE	ENVIRONMENTAL PROTECTION AGENCY	Protect human health and the environment
INDEPENDENT/QUASI GOVERNMENTAL	ASSOCIATION OF STATE FLOODPLAIN MANAGERS AND STATE AFFILIATES	Reduce the loss of human life and property damage resulting from flooding. Preserve the natural and cultural values of floodplains. Promote flood mitigation for the prevention of loss and the wise use of floodplains. Avoid actions that exacerbate flooding.
DEPT OF AGRICULTURE	RURAL DEVELOPMENT	Rural Development is committed to helping improve the economy and quality of life in all of rural America
DEPT OF HOUSING AND URBAN DEVELOPMENT	COMMUNITY PLANNING AND DEVELOPMENT	Increase homeownership; support community development, and increase access to affordable housing free from discrimination
DEPT OF INTERIOR	US GEOLOGICAL SURVEY	Serve the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.
DEPT OF INTERIOR	US FISH AND WILDLIFE SERVICE	Working with others to conserve, protect andenhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people
DEPT OF TRANSPORTATION	MARITIME ADMINISTRATION	To improve and strengthen the U.S. marine transportation system - including infrastructure, industry and labor - to meet the economic and security needs of the Nation
DEPT OF COMMERCE	ECONOMIC DEVELOPMENT ADMINISTRATION	Generate jobs, help retain existing jobs, and stimulate industrial and commercial growth in economically distressed areas of the United States. EDA assistance is available to rural and urban areas of the Nation experiencing high unemployment, low income, or other severe economic distress.
DEPT OF COMMERCE	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE	Provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life
ALL FEDERAL AGENCIES	EXECUTIVE ORDER 11988	Avoidance of impacts associated with occupancy and modification of base flood plain and avoidance of support of development in the base flood plain

"The Trinity River Vision: A Master Plan for the Trinity River and Major Tributaries in Greater Fort Worth," a presentation by Becky Griffith, CESWF, at the Planning CoP Conference, San Francisco, CA, May 2006

The Fort Worth District entered into a collaborative venture with five local and State sponsors involved in realizing a master plan for the City of Fort Worth, Texas. The "Central City" project was initiated under the Clear Fork/West Fork FSCA, 2002, with objectives to "evaluate ongoing planning initiatives for compatibility with Federal purposes" and to "formulate a Federal plan for flood damage reduction and ecosystem restoration." The master plan involves reconnecting the urban area to the river by encouraging development and redevelopment along the waterfront; linking neighborhoods to the river, open space, and recreational opportunities; linking the CBD with the Cultural District and the Stockyards by making ecosystem and water quality improvements and constructing structural features. Project authorization is provided in P.L. 108-447, Sect. 116 and states "The project for flood control and other purposes on the Trinity River and Tributaries, Texas…is further modified to authorize the Secretary to undertake the Central City Project, as generally described in the Trinity River Vision Master Plan…."

Implementation issues arose during the planning process. These included

NEPA compliance
- Regarding direct, indirect or cumulative effects,
- Which agency is responsible for compliance?
- How mitigation is apportioned, and
- What would be the record of decision?

What exactly is being authorized?
- How is recommendation for authorization submitted?
- Whose process is followed?
- How are the components linked?
- How are changes managed?

Design synchronization

Apportionment of Real Estate acquisition and responsibilities
- Federal or State process followed?
- Consistency with Federal processes

Authority and funding for "Collaboration"

Cash flow and budgeting

Return

The Federal Advisory Committee Act

The Federal Advisory Committee Act (FACA), Public Law 92-463, (5 U.S.C., App. 2) was enacted in 1972 to ensure that advice rendered to the Executive Branch by the various advisory committees, task forces, boards, and commissions, formed over the years by Congress and the President, be both objective and accessible to the public. Congress passed FACA to regulate the advice Federal agencies received from non-Federal sources. FACA demands that agencies meeting with 'advisory committees' follow strict regulations and open meetings of such committees to the public. An advisory committee is a group of any kind:

> "established by statute, or established or utilized by the President or by an agency official, for the purpose of obtaining advice or recommendations . . . or on issues or policies within the scope of an agency official's responsibilities."
>
> 5 U.S.C. Appendix 2 §3.

FACA usually applies when an agency receives advisory committee input on matters affecting agency policy. The application of FACA is fact specific and subject to few general rules. Most of the Corps' FACA issues arise under the two phrases:

(1) *Established or utilized*: FACA applies to groups created or used by Congress, the president, or a Federal agency. An agency "uses" a group when it has some control over that group – such as personnel or agenda. FACA will not apply to individual opinions of non-Federal participants or group advice or recommendations provided at one-time meetings.

(2) *For the purpose of obtaining advice or recommendations*: FACA may apply when the primary purpose of a group is the solicitation of advice or recommendation on a matter of agency policy. Technical advice generally does not qualify as policy. FACA also does not apply to contracts for advice or recommendations.

If FACA applies, then the agency must take specific steps to publicize the operation of the advisory committee. These duties include: requiring the membership of the committees to be fairly balanced in points of view represented, requiring agencies to file a charter with the General Services Administration (GSA) for approval, and assuring that no special interests will inappropriately influence the committee. Because advisory committees subject to FACA are costly, they are discouraged by Army policy.

FACA only applies to federal agencies that seek policy advice from non-governmental sources. This means that FACA will not apply to meetings

involving only Federal employees, even when those employees are from different agencies. Such meetings may however be regulated by AR 15-1 “Committee Management” and DoD Directive 5105.4.

FACA very rarely applies to involvement solely by state, Tribal and local government personnel. Congress amended FACA through the Unfunded Mandates Act to allow Federal employees to meet with “elected officers of State, local and tribal governments (or their designated employees)... for the purposes of exchanging views, information, or advice relating to the management or implementation of Federal programs that explicitly or inherently share intergovernmental responsibilities.” 2 U.S.C. §1501 Note. Such meetings may however be regulated by AR 15-1 “Committee Management” and DoD Directive 5105.4.
return

Floodplain and Watershed Management in the Napa Valley

Fall 1998 Floodplain Management Association Conference
September 18,1998,. In Sacramento, CA

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Abstract

The City of Napa has suffered from 27 floods between 1862 and 1997, with the largest flood occurring on February 18, 1986. Between 1961 and 1997, Napa County residents suffered $542 million in property damage. After the 1986 Flood, the City made an ambitious effort to reduce damages from floods, and after the 1995 floods, the effort became the top priority throughout Napa County.

In January 1996, the Friends of the Napa River, Napa Valley Economic Development Corporation, Napa County Flood Control District and Corps of Engineers invited residents, businesses, local government, and numerous resource agencies to become part of a Community Coalition to create a flood protection project that will be built through the City of Napa. The Coalition established goals of 100-year flood protection, an environmentally restored, "living" Napa River, enhanced opportunities for economic development, a local financing plan that the community could support, and a plan that addressed the entire watershed countywide.

With the plan, a campaign, organized by the Citizens for Napa River Flood Management, was launched to fund the local share of the project. Other funding sources have been sought to fund countywide floodplain and watershed management and reduce the local share of the project costs. On March 3, 1998, the Napa County voters approved a one-half cent sales tax, known as Measure "A". Measure "A" will also fund flood protection, drainage improvements, dam safety and watershed management projects for each community in the County and in the unincorporated area of the County.

There are many aspects of floodplain management included in the Napa River Flood Protection Project. Projects on the Upper Mississippi River, South Platte River in Colorado, Red River of the North, Kissimmee River in Florida and Napa River show that the goal of flood control is being replaced by flood management and hazard mitigation.

I Introduction

On March 3, 1998, the Napa County voters approved a one-half cent sales tax, known as Measure "A", which will fund flood protection and watershed management projects throughout Napa County. The Napa River Flood Protection Project (Project), which is a $170 million, seven mile long, channel-widening project, will receive two-thirds of the funding from Measure "A". The Project contains many aspects of floodplain and watershed management, and this paper will provide a list of potential funding sources, participants and practices used on the Project. Much of this paper is taken from the "Citizen's Guide to the City of Napa, Napa River and Napa Creek Flood Protection Project".

II History of Flooding

A. Damages

Napa City was founded in 1847, where the Napa River flattens out into the San Pablo Bay estuary, which is a desirable geographical location that is unfortunately somewhat prone to flooding. There is a 300 square mile watershed above the City of Napa. Between 1862 and 1997, the City of Napa has suffered from 27 floods with the largest flood occurring on February 18, 1986.

Between 1961 and 1997, Napa County residents have suffered an estimated $542 million in property damage. This does not include the cost of lost tourism, delayed projects, environmental damage, deaths, pain and suffering. Napa County has the third most flood damage claims in California and probably the highest per capita.

During the 1986 flood, 20 inches of rain fell within a 48-hour period near Napa at a gage with an annual average rainfall of 36 inches. There were three deaths, 250 homes destroyed, 2500 homes damaged and 5000 people evacuated from their homes. There are about 2500 properties in the floodplain in the City of Napa.

During March 1995, the City suffered from a flood that was nearly as large as the 1986 flood. During January 1997, the City suffered from a ten-year return period flood. This winter, Napa received 200 percent of the normal rainfall, but there were breaks between the storms, so there was only minor flooding, which occurred on February 3, 1998.

B. Floodplain Management

In the 1930's, the US Army Corps of Engineers (Corps) began dredging and straightening the Napa River for navigation and flood control. In 1965, Congress authorized the development of a detailed project proposal for flood control and in

1975 the Corps of Engineers submitted the first project proposal. Napa County voters rejected the proposal, because the project was not environmentally sensitive.

After the 1986 Flood, the City made an ambitious effort to reduce damages from floods. The City promoted a flood protection project and participated in the creation of the "Napa River Watershed Owners Manual", but floodplain management and watershed management were considered separate issues. The Owners Manual set goals and practices for improving water quality and habitat in the watershed and not flood protection.

The City participates in the National Flood Insurance Program, created an Emergency Plan based on the Standard Emergency Management System, installed ALERT rainfall and stream monitoring gages, participated in Flood Awareness Week, applied for FEMA Hazard Mitigation Grant Program funds, and hired a consultant to prepare a Storm Drainage Master Plan to address localized flooding and water quality improvements.

The City and County use the NWS HydroMet program to watch the rise in the streams and the Storm Watch program to get a visual interpolation of the rainfall intensities. The City has also prepared sandbag demonstrations, the "Citizen's Guide to Flooding and Flood Recovery", and the "Street Closure and Barricade Map" that the City uses to close streets in phases and detour traffic. Community outreach in the newspaper, on the radio and on the local access cable TV channel has also been important.

In January 1996, the Friends of the Napa River, Napa Valley Economic Development Corporation, Napa County Flood Control and Water Conservation District (NCFCWCD) and Corps of Engineers invited residents, businesses, local government, and numerous resource agencies to become part of a Community Coalition to create a flood protection project that will be built through the City of Napa. The Corps of Engineers is the federal sponsor of the Project and the Napa County Flood Control District is the local sponsor. The Coalition quickly changed the project from flood control to flood management, recognizing the diverse array of needs and values affected by river flooding, and addressed flood protection and environmental restoration needs throughout the County.

III The Community Coalition

A. Participants

Many agencies, groups and individuals were involved in the Coalition and each had their own interests and culture. To have these people even talking to each other, much less cooperating to create a flood protection project, was an impressive part of the Project.

Some of the agencies involved in the creation of the plan include the Napa County Resource Conservation District, Regional Water Quality Control Board, California Department of Fish and Game, State Lands Commission, Natural Resource Conservation Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, National Marine Fisheries Service, and the U.S. Army Corps of Engineers, Napa County and all of the Cities in the County.

Some of the groups involved in the creation of the plan include the Friends of the Napa River, Napa Valley Economic Development Corporation, Napa Chamber of Commerce, Sierra Club, Napa County Vintners Association, Napa County Landmarks, Napa County Land Trust, Napa-Solono Building Trades Council, Napa Valley Conference and Visitors Bureau, Napa Downtown Merchants, Napa County Farm Bureau, Suscol Council, Agricultural Commission, and Napa Valley Grape Growers Association. Local architects and business owners also provided valuable input.

Some of the outside experts involved with the creation of the Project included Phillip Williams of Phillip Williams and Associates, Luna Leopold of UC Berkeley, Woody Trihey of Entrix, and Ann Riley of the Waterways Restoration Institute.

The Community Coalition was instructed in geomorphology, hydrology, real estate acquisitions, financing, aesthetics, and the definition of a living river strategy. Using consensus building, a plan was created with floodplain and marshplain terraces, bioengineered bank stabilization, wetland creation, bridge replacements, a flood bypass, river trail and architectural drawings.

B. Goals

The Coalition established goals of 100-year flood protection, an environmentally restored, "living" Napa River, enhanced opportunities for economic development, a local financing plan that the community could support, and a plan that addressed the entire watershed countywide.

A "living Napa River" would convey variable flows and restore habitat in the floodplain, balance sediment input with sediment transport, provide natural fish and wildlife habitat, maintain high water quality and supply, offer improved recreation opportunities, maintain its aesthetic qualities, and generally enhance the human environment. By using the living river strategy, the project is self-mitigating and will create about 500 acres of wetland and marshland habitat by removing levees and returning tidal influence to historic baylands.

C. Design

It was important to get early input and support from the resource agencies, the public and design engineers. The public wanted to be heard, the resource agencies wanted to provide input early in the design, and the engineers provided constructability evaluations.

The Mike 11 computer program, which was created by the Danish Hydraulic Institute, was used to study flood flows on the floodplain and marshplain terraces, set terrace elevations and widths, present the project visually to the Coalition, and evaluate sedimentation rates. The Mike 11 Modeling System is a dynamic, one-dimensional hydraulic model that can show the flood moving through the project in plan and profile views. Mike 11 is a software package for the simulation of flows, water quality and sediment transport in estuaries, rivers, and channels.

The Corps of Engineers blended engineering and ecology to design the $170 million, seven mile long, channel-widening project. The Corps mostly used HEC-2 to set the height of the floodwalls and levees, but these were usually only about three to four feet high. The Corps did have to use the two-dimensional DWOPER program to calculate the water surface elevations through the big bends in the "oxbow". The Corps studied the interior drainage on the land side of the floodwalls and levees so that they could size the pumps that would push the localized runoff into the River during high flows.

The Corps, with very active participation of the NCFCWCD and City of Napa, also prepared the environmental document and wrote a Citizen's Guide to explain the project to the layperson, prepared a video, had photo renderings made, and held the public meeting. The plan was reviewed and revised by the public, resource agencies and City and County staff. The all mighty benefit-to-cost ratio was close to unity. Even though the Corps assumed that the principal benefit would be the reduction in flood insurance, there are more benefits to this project.

Residents, business owners, and City staff wanted flood protection, but they were concerned with a six-mile long swath being cut through the heart of the City, the removal of 109 buildings, and the disruption to traffic and businesses during construction. City staff met with property owners, created a traffic-phasing plan and will create design principals for the aesthetics of the project.

IV The Flood Protection and Watershed Management Plan

A. The Campaign

With the draft plan and environmental document, a campaign, organized by the Citizens for Napa River Flood Management, was launched to fund the local share of the project. Voter polls showed that a 20-year, one-half

cent sales tax was more achievable than a benefit assessment or an Ad Valorum property tax. When the Board of Supervisors decided to have a special election requiring a two-thirds majority, everyone knew that they had a big job ahead of them.

The campaign, for a ballot initiative known as Measure "A", promoted the benefits of avoiding lost business revenue, savings in annual flood insurance, property value enhancement, and improved health and safety by increasing access to the urban areas of Napa. People were told that for every $1 spent in flood protection, Napa City residents would receive a projected $7 in savings on property damage.

Wineries that depended on tourism contributed to the $400,000 campaign, even though one-third of the funding from the one-half cent sales tax will come from tourists. The Corps and NCFCWCD spent $450,000 on the Community Coalition, so the total cost of the coalition process and campaign approached $1 million, which does not include the 7,000 person hours that the public, resource agencies and City staff contributed. The Citizen's Guide to the Project, a list of projects for each community in the County, the creation of oversight committees, 80 community outreach presentations, over 200 volunteers getting the word out, phone calls on election day, letters to the editors, support by the local media, a strong national economy and even El Nino all influenced a two-thirds vote of approval.

Having the campaign and election during the flood season took advantage of everyone's piqued awareness of the potential for flooding. It took advantage of the "hydro-il-logical" cycle of complaining that nothing is being done about flooding during a flood and forgetting about flooding a short time after the flood. It was also important to emphasize the personal suffering by people impacted by floods and the video titled "Race with the River" accomplished this. The video was shown at presentations to acquaint people with the Napa River Flood Protection Project and promote Measure "A".

On March 3, 1998, the Napa County voters approved a one-half cent sales tax to fund the local share of the project through the City of Napa and numerous flood protection and watershed management projects throughout the County. The polling was proven correct because 300 out of 27,000 votes cast decided the election.

B. Other funding sources

Other funding sources have been sought to fund countywide floodplain and watershed management and reduce the local share of the project costs. This "layering" of funds from many sources is critical to a

comprehensive Flood Management Plan in a community like the Napa Valley, which has huge flooding problems but a population of only 120,000 people.

A Storm Water System Service Fee was adopted by the City Council, which provides an annual $350,000 dedicated funding source for storm drainage construction, maintenance, grant matching funds and water quality improvements. The Flood Control District adopted a similar watershed management assessment for channel maintenance, bank stabilization cost share program, water quality compliance, studies, and grant matching.

In 1997, the Governor's Office of Emergency Services awarded the City $7 million in FEMA Hazard Mitigation Grant Program. Napa County and the Town of Yountville received FEMA funds for home elevations and the Friends of the Napa River received FEMA funds to construct door dams in Downtown Napa. The Department of Water Resources also provided an Urban Streams Restoration Program grant for the purchase of a non-residential parcel.

The funds will reduce the local share of the Flood Protection Project and allow the early acquisition of 90 mobile home park units, the early acquisition of seven homes on Napa Creek, the construction of drainage improvements to protect areas not protected by the Flood Protection Project, and the elevation of homes that were not protected by the Project.

The City has applied for $20 million in FHWA Highway Bridge Replacement and Rehabilitation funds to replace three of the bridges in the Project area. The Corps will be responsible for the design and construction of five of the thirteen bridges. Bridges and utilities account for 22 percent of the project costs.

The Flood Control District is receiving funding from the CalFed Bay-Delta Program, which is the largest ecosystem restoration program in the world. In 1996, California voters passed Proposition 204, which is a $955 million bond for the state's share for safe, clean and reliable water projects. CalFed and Coastal Conservancy grants will be used to acquire land and remove levees. The removals will increase the River's flood flow carrying capacity and return tidal influence to diked historic baylands.

The potentially big funding source is the state subvention funds. If the state meets its obligation to fund 70 percent of the local share of flood control projects and pays for the six or so projects in front of the Napa Project, then the 20-year term of the sales tax will be reduced. Because of the budget surplus, the state is funding subventions for the first time in

almost a decade, but funding is much less than the obligation. The 1998-99 State of California budget shows Napa receiving $1.1 million.

C. **The Project in the City of Napa**

Congress must still adopt the environmental document and provide the federal funding, and the NCFCWCD Board must certify the environmental document. The City will prepare the schematic design of the downtown, replace six bridges, and construct the recreational elements of the project. The Flood Control District will acquire lands, relocate utilities, and maintain the project. The Corps will excavate 1.7 million cubic yards of soil, stabilize banks, and construct floodwalls, levees and pump stations. During construction, water quality, endangered species, traffic control, hazardous materials, archaeological remains, and tenant relocations will be of great concern.

Easements or full acquisitions will be required on 300 parcels. An incredible 32% of the Project costs are for land acquisition and only 9% are for levees and floodwalls. This shows the Project is giving the floodplain back to the River instead of just building floodwalls.

With the project, a performance-based maintenance and monitoring plan will be created to reduce unnecessary dredging and environmental damage. A watershed model using ALERT data to make flood forecasts and monitor water quality will be used to predict sedimentation rates and maintenance needs.

One operational issue will be to close floodgates across McKinstry Street during high flows because it will pass through the bypass. Under the Project Cooperation Agreement, the Flood Control District will be required to modify the Flood Preparedness Plan to have alarm settings on the gages and to close the flood gates.

D. **Other Projects**

Flood protection, drainage improvement and dam safety projects were proposed for each community in the County and in the unincorporated area of the County. For example, American Canyon will implement their Storm Drainage Master Plan, Yountville will protect its mobile home parks from regular flooding, St. Helena will construct flood management measures along the River, and Calistoga will stabilize Kimball Reservoir. These projects still have to be designed, reviewed and approved by the oversight committees, but the funding is in place.

E. Watershed Management

In terms of watershed management, land use practices must not negatively impact the 100-year protection. Various kinds of development, including the conversion of hillside forests to vineyard could increase the volume and timing of floods. Erosion could cause sedimentation and the reduction of flood carrying capacity. In 1968, Napa County voters passed an agricultural preserve with rural-urban limit lines around the cities. Napa County has an ordinance for hillside development and may need to create an ordinance to freeze the hydrology of the Project by not allowing the peak flow rate in Napa to increase.

The ordinance would require development to mitigate increases in runoff and sediment that would affect the Flood Protection Project. Detention is one solution to allowing future development in the watershed. Detention also has the added benefit of reducing sediment and pollutants.

The Resource Conservation District, which has received many grants from many agencies for their watershed management projects, was recently awarded a CalFed grant to fund a $340,000 Watershed Stewardship workplan. The work plan will establish demonstration sites for watershed restoration techniques, fund data collection and modeling with the Mike 11 model, develop new stewardship groups, address system stress and report to US EPA and CalFed.

The RCD has an excellent working relationship with the wineries and landowners and has made people feel like they are not dealing with a bunch of regulators. The RCD has emphasized the importance of the soil to the wine, so the wineries have made an effort to not lose that soil. Erosion control measures have improved during the 1990's and dredging quantities in the River have been reduced.

Another advantage of watershed restoration is that it attenuates the flood peaks by slowing down the runoff and flattening out the hydrograph.

V Conclusion

The Coalition process was a slow and expensive process, but it paid off during the campaign and review of the environmental document. People tend to support something that they help create, and broad-based support from diverse groups was imperative to get the two-thirds vote. Additionally, the use of funding from many sources helps to reduce the local cost of the project to the residents, which makes the project more acceptable.

There are many aspects of floodplain management included in the Napa River Flood Protection Project – emergency planning, home elevations, property acquisitions, bridge replacements, channel modifications, set back levees, drainage improvements, ordinances, land use practices, and wetland creation. The Project succeeded by minimizing the disruption and alteration of river habitat

and maximizing the opportunities for environmental restoration and enhancement throughout the watershed.

Projects on the Upper Mississippi River, South Platte River in Colorado, Red River of the North, Kissimmee River in Florida and Napa River show that the goal of flood control is being replaced by flood management and hazard mitigation. The Napa River Flood Protection Project has been successful because it incorporated watershed management practices and it is a comprehensive, multi-agency, mitigation plan using many funding sources to provide flood protection.

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Reviewers: Larry Pollard, Assistant Public Works Director, City of Napa

Cassandra Walker, Redevelopment Coordinator, City of Napa

Howard Siegel, Napa County Flood Control District

Rick Reinhardt, Corps of Engineers, Sacramento

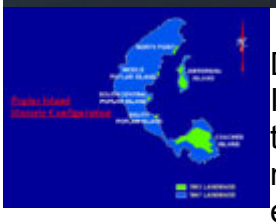
Bob Zlomke, Napa County Resource Conservation

Return

Poplar Island
Environmental Restoration Site

Introduction

Poplar Island, recently on the verge of disappearing, is today a national model for habitat restoration and the beneficial use of dredged material. The U.S. Army Corps of Engineers, Baltimore District has teamed with the Maryland Port Administration and other Federal and State agencies to restore Poplar Island using dredged material from the Baltimore Harbor and Channels Federal navigation projects (only approach channels). Just off the Chesapeake Bay coastline, about 34 miles south of Baltimore in Talbot County, MD, Poplar Island is being returned to its former size and important ecological function while helping to ensure the economic vitality of the region. Approximately 40 million cubic yards (mcy) of dredged material will be placed to develop 570 acres of wetlands and 570 acres of uplands.



During the second half of the nineteenth century, Poplar Island experienced a significant amount of change. In 1847, the island was more than 1,000 acres in size. The forces of nature continued to alter the island. By the early 1900s, the continually eroding shoreline had split the island into three separate landmasses. Development on the island had evolved to include numerous farms, a post office, school, and sawmill, but the residents were becoming increasingly concerned about their shrinking real estate.

It was probably Poplar Island's abundant wildlife and isolated beauty that attracted President Franklin D. Roosevelt and President Harry S. Truman to the location. In 1931 the Jefferson Islands Club was established to provide a weekend retreat for prominent Democratic politicians and businessmen of the

era. By 1931, Poplar Island, the northernmost of the three islands, had been reduced to only 134 acres.

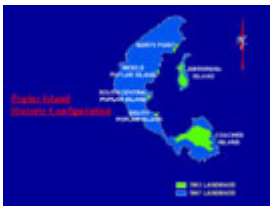
By the 1960s, the main island was barely 80 acres. Over the next 30 years the islands continued to diminish in size and by 1990 the total area was less than 10 acres.

In 1994, an interagency group, including the U.S. Army Corps of Engineers, the Maryland Port Administration, and Federal and State environmental agencies studied the feasibility of using Poplar Island as a beneficial use project for dredged material from the Chesapeake Bay navigation channels leading to the Port of Baltimore. Following the necessary environmental studies, it was determined that rebuilding Poplar Island and restoring over 1,000 acres of diverse habitat was a viable beneficial use of dredged material.

In September of 1996, the project was approved for construction. A Project Cooperation Agreement was executed with the State of Maryland in April 1997. Construction began in 1998 and the project is expected to be completed by 2016.

Project Description

The project consists of reconstructing Poplar Island to its approximate size in 1847 using uncontaminated dredged material from the Baltimore Harbor and Channels Federal navigation projects. The rebuilding of the island has been developed through the cooperative efforts of many Federal and State agencies, as well as public and private organizations. A Feasibility Report and Environmental Impact Statement, dated February 1996, was approved by the Assistant Secretary of the Army (for Civil Works) in September 1996.



The restoration of the island involves placing, shaping, and planting approximately 40 mcy of dredged material to create 1,140 acres of equal shares of wetland and upland habitat. The material is dredged during maintenance of the approach channels to Baltimore Harbor. Over the life of the project, the material will be placed behind 35,000 feet of containment dikes surrounding the four remnants of the main landmass known as Poplar Island.

Of the wetland areas, 80 percent will be developed as low marsh and 20 percent as high marsh. Small upland islands, ponds, and dendritic guts or channels will be created to increase habitat diversity within the marsh areas. Habitat diversity

will be increased in the upland areas by constructing small ponds and providing both forested and relatively open scrub/shrub areas.

The containment dikes for the dredged material are being constructed in phases. The first phase involved the construction of dikes to enclose a 640-acre area and a breakwater between the dike and Coaches Island to protect Poplar Harbor. This work was completed in March 2000. The second phase involved the construction of dikes to enclose the remaining 500 acres, which was completed in February 2002. The third phase involves incrementally raising the dikes in the upland areas from an initial elevation of 10 feet mean lower low water (MLLW) to an elevation of just over 20 feet MLLW. As cells of the project are completely filled and shaped, permanent vegetative planting will occur.

Initial inflow of dredged material was in April 2001. Future inflows will occur annually over the 16-year life of the project during the fall and winter timeframe.

Environmental and Economic Benefits

The project serves as an environmentally beneficial solution to the dredged material placement problems facing the Port of Baltimore. The Port estimates that over the next 20 years, maintenance dredging, coupled with needed improvements to the Chesapeake Bay's shipping channels, could generate as much as 100 mcy of dredged material. A disruption in the constant maintenance that is required to keep the Port of Baltimore operational would result in significant adverse effects to both the local and national economy. The Port handles approximately 40 million tons of commerce per year, contributes $1.4 billion in business to the state's economy and generates 79,000 jobs, 15,000 of which are directly related to Port activities. Revenue impact from the Port represents one-tenth of Maryland's gross product.

Poplar Island has been identified by the U.S. Fish and Wildlife Service, the Maryland Department of Natural Resources, and many other resource management agencies as a valuable nesting and nursery area for many species of wildlife, including eagles, osprey, heron, and egret. Island habitat for many wildlife species native to the Chesapeake Bay is sparse and degrading, but creating the combination of upland, wetland, near-shore, and shoal habitats during restoration of the island will offer a critical diversity of habitat resources.

Project Costs

On September 4, 1996, the Record of Decision was signed and the project was subsequently approved for construction under Section 537 of Water Resources Development Act 1996. The authorized federal project cost is $307 million.

A Project Cooperation Agreement was executed with the State of Maryland in 1997, with the project to be cost-shared 75 percent Federal and 25 percent non-Federal. The current project cost estimate is approximately $340 million.

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Urban Rivers Restoration Initiative

In July 2002, the U.S. Environmental Protection Agency (EPA) and the U.S. Army entered into a memorandum of understanding [PDF, 4 pp., 221 kb] to address water quality issues, economic revitalization, and the public use and enjoyment of urban rivers. The two agencies agreed to designate eight (8) demonstration pilot projects to coordinate the planning and implementation of urban river cleanup and restoration.

An Urban Rivers pilot designation will bring about increased coordination and cooperation between the EPA and the U.S. Army Corps of Engineers with respect to restoring degraded urban rivers and will involve remedial, water quality, and environmental restoration activities related to each agency's respective authorities (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act, various Water Resources Development Acts, the Resources Conservation and Recovery Act, and the Clean Water Act.

A NEW APPROACH TO CLEANING UP CONTAMINATED URBAN RIVER CORRIDORS IN THE UNITED STATES: THE URBAN RIVER RESTORATION INITIATIVE

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ABSTRACT: Many urban rivers in the United States contain severely contaminated sediments that adversely affect aquatic life and limit recreational and economic uses. The U.S. Environmental Protection Agency estimated in 1997 that more than 1.2 billion cubic yards of contaminated sediment exist nationwide. In response to this situation, a new cooperative program to restore rivers affected by contaminated sediments is being undertaken by the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency.

The EPA and the Corps plan to agree to enter into watershed-specific Memoranda of Understanding (MOUs) to coordinate remedial, water quality and environmental restoration activities under appropriate U.S. federal environmental laws at locations where such cooperative arrangements are agreed to be mutually beneficial. Under such watershed-specific partnership agreements, the agencies will conduct cooperative project planning and development processes that integrate the provisions of appropriate environmental remediation authorities. These agreements will be carried out in conjunction with other appropriate federal, state and local agencies to identify and implement projects to protect public health, remediate and restore urban rivers in the interest of ecological restoration and economic revitalization.

The Urban River Restoration Initiative has strong synergy with several other current major environmental initiatives in the United States, such as the Brownfields Redevelopment Initiative; the Total Maximum Daily Load Initiative; the Natural Resource Damage Assessment and Restoration Program; and new ecosystem restoration and protection, and aquatic ecosystem restoration authorities provided to the Corps in recent Water Resources Development Acts.

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Review of Guidance and Procedures for Regional Economic Development and Other Social Effects

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Institute of Water Resources

August 2006

I. Introduction and Background

This document is the product of a limited effort to address other social effects and regional economic development as required by EC 1105-2-409, Planning in a Collaborative Environment (EC 409). It is designed to:

1) Research and document procedures to measure and assess Regional Economic Development (RED) and Other Social Effects (OSE) and recommend potential approaches.

2) Identify future research needs and develop a plan of action to conduct the required research.

Other documents in development--Collaborative Planning Handbook, RED Handbook and OSE Handbook—will include greater technical detail and provide information on additional tools, techniques and models for decision making with the four accounts, RED and OSE respectively. Other efforts are mentioned in Section IV Future Efforts.

The four evaluation accounts, National Economic Development (NED), Environmental Quality (EQ), Regional Economic Development (RED) and Other Social Effects (OSE), have consistently appeared, in various forms and nomenclatures, in federal guidance for many years. What has varied is their "status"—whether required—and importance—whether considered in formulation and plan selection.

 OSE and RED and their use in planning are not new.

ER1105-2-100 (ER 100) and the Principles and Guidelines for Water and related Land Resources Implementation Studies, March 10, 1983 (P&G) both contain the statement "Other plans which reduce net NED benefits in order to further address other Federal State, local and international concerns not fully addressed by the NED plan should also be formulated." However, guidance and plan selection criteria did not support the effects in the RED or OSE accounts as of primary importance to plan selection so such plans were marginalized and not the basis of plan formulation, selection or recommendation. In nearly all cases, this meant that such plans were not even developed or few resources were expended on them.

Other key statements in ER100 reinforce this position:

- "The national economic development account is required. Other information that is required by law or that will have a material bearing on the decision-making process should be included in the other accounts, or in some other appropriate format used to organize information on effects." (figure 1-1, ER1105-2-100)
- "Display of the regional economic development and other social effects account is discretionary." (ER 1105-2-100, 2-3 d. (4))

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 EC 409 emphasizes the importance of the RED and OSE accounts.

EC 409 brings the OSE and RED into the decision making process:

- "Any alternative plan that has net beneficial effects across the four P&G accounts may be recommended, i.e., a non-NED plan may be the recommended plan."

This is further reinforced by a clear statement on the importance of considering

the full spectrum of plan effects, i.e., not a Corps of Engineers centric view:
- "Highest budget priority will be given to collaborative planning activities that embrace the full range of the national Federal interest."

 Federal investment should embrace the full Federal interest.

These are significant changes in the orientation of Corps' planning and have ramification to the Corps' civil works plan formulation and evaluation process (see Section II). These changes also greatly increase the emphasis and potential application of the RED and OSE accounts.

The RED and OSE accounts and factors will vary in importance for projects. The full list of RED and OSE factors should be reviewed by the project analyst and it is recommended that the full list be displayed in a table in the study documentation. This will confirm that all factors were considered, even if most are not applicable. An initial screening of factors is needed early in the study process to determine the potential for RED/OSE factors to be significant for the project, for specific alternatives or for plan selection. The factor may be significant and/or there may be a significant impact.

Early assessment of significance will focus resources on selected factors.

Significance is derived from institutional, public or technical recognition (ER 100, 2-4. m. (1)) "Institutional recognition means its importance is recognized and acknowledged in the laws, plans and policies of government and private groups. Technical recognition of a resource or an effect is based upon scientific or other technical criteria that establish its significance. Public recognition means some segment of the general public considers the resource or effect to be important." Significance will be a key factor in integrating RED/OSE into the evaluation process. Significance of many factors is not static. It is contextual, e.g., increased income (RED) may be of greater importance to a population in an area experiencing economic distress and limited opportunities. There is an abundance of literature on RED and OSE, particularly human costs of disasters. It cannot be applied indiscriminately but provides a road map for how to think about RED and OSE factors.

 Significance must be established in a region specific, cultural context.

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II. Decision Making in Collaborative Planning

The main intent of EC 409 is to encourage the full and explicit consideration of significant plan effects. Collaborative planning offers the opportunity to combine the efforts of various Federal and non-Federal entities to shape the planning process based on their respective missions and interests. Implicit in the collaboration process is the equal consideration of all potential significant effects of the plans under evaluation. In evaluating a "national interest plan" in a collaborative setting, the full range of effects across the four accounts should be evaluated. The EC, however, requires the identification of the NED Plan as part of the formulation process to provide sufficient documentation of the plan selection procedure and to explicitly display the trade-offs between the selected plan and the NED Plan.

 How is the best plan identified?

One of the perceived difficult tasks associated with the implementation of EC 409

is how to identify the plan that provides the maximum “net beneficial effects” across the four evaluation accounts (NED, EQ, RED and OSE). The large number and diversity of parameters that can be considered under each of the accounts and the diversity of metrics to assess the effects augment the challenges associated with this task. Clearly displaying and documenting the significant effects provides the rationale required to recommend a deviation from the NED Plan. In most cases, a trade-off analysis will be required to inform and support the decision making process. Additional guidance and manuals to be developed in subsequent phases of this effort will address evaluation and the use of RED and OSE in decision making.

 A recommended plan cannot provide benefits only in the RED and OSE accounts.

The evaluation of the various accounts will be consistent with the scope of the study and in proportion to the extent they are expected to affect the plan selection. RED and OSE effects are generally evaluated at some level in National Environmental Policy Act (NEPA) documentation for all studies.

In addition to quantifying RED effects and indicating the OSE effect, i.e., positive/negative or beneficial/adverse and measuring the quantity or quality of effect, contributions to the planning objectives and evaluation criteria (effectiveness, efficiency, completeness, acceptability) should be discussed.

- Effectiveness -The extent to which the alternative plans contribute to achieving the planning objective.
- Efficiency - The extent to which the alternative plan is the most cost effective means of achieving the objectives.

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- Completeness - The extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of planning objectives, including actions by other Federal and non-Federal entities.
- Acceptability - The extent to which the alternative plans are acceptable in terms of applicable laws, regulations and public policies.

The Planning Manual, IWR Report 96-R-21, Table 34 is an example of displaying RED and OSE effects.

 The vision of EC 409 is more effective and inclusive water resources planning and implementation.

III. Review of Guidance and Procedures

A. Regional Economic Development

 “The regional economic development account registers changes in the distribution of regional economic activity that result from each alternative plan.”

1. Introduction and Background

This section is a discussion of current guidance on regional economic development benefits contained in ER1105-2-100, past approaches used in the Corps, and other Federal agency approaches. A separate Plan of Action outlines research needed to develop final, analytically comprehensive procedures for RED. These actions are addressed briefly in Section IV of this document.

 There are many techniques for performing RED analysis.

There are seemingly limitless meanings and models for RED. This document addresses RED protocols developed or used by the Corps at various times (ER 100; and Regional Development Impacts, 1985). In addition, two other protocols are included: Department of Commerce (DOC) Regional Input-Output Modeling System (RIMS II) and the Recreation Economic Assessment System (REAS). The framework of each of these items is discussed later in this document. Other commonly used approaches, such as IMPLAN, will be included in the RED Handbook which is under development.

Many universities have regional centers for economic development and produce models “customized” to the region. These centers may have valuable current and historic data available and often are available to perform RED analysis. Some RED categories of effects may overlap the OSE account.

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The RED account has waxed and waned in interest in Corps planning over the last 30 years. The advent of cost sharing saw an interest in RED expressed by sponsors but it did not receive emphasis in studies. The current guidance on planning for Corps projects, ER 100, Appendix D (Economic and Social), Amendment 1, 30 June 2004, has only brief references to RED. P&G includes comments on the use of the RED account; the RED categories of effects—regional income and regional employment—discussion of measurement standards and detailed discussion by category of effect.

Measurement of RED effects is generally to be quantitative within available and accepted methods. It is important to be aware of the critical differences between NED and RED effects.

 It is important to separate NED and RED effects to avoid double counting.

2. Frameworks

ER 100 and the P&G contain identical basic definitions of RED. The primary difference is the lack of definition and discussion of the components of RED in ER 100. Current guidance does not restrict RED considerations to the list of effects provided, although virtually all RED effects will be contained under either regional income or regional employment. The list reflects items commonly of importance to communities and which are most likely to be affected by projects. Other categories or a more detailed evaluation of RED effects may be included in planning reports if they are relevant to a specific project. There is no distinction made by business lines, i.e., navigation versus flood control, although certain effects are more closely correlated with some business lines than others.

 RED effects are generally regional income or employment.

The review document developed by IWR in 1985 provides the most detailed description of a range of methodologies. The major task to be accomplished in the report was “to introduce three alternative quantitative methodologies”. These methodologies were applied to navigation projects but the theories are applicable across business lines. Although dated, much of the discussion is still useful and the format is easy to use. A handbook of contemporary techniques for RED is being developed.

In the 1970's, the Bureau of Economic Analysis (BEA) developed a method for

estimating regional Input-Output (I-O) multipliers known as RIMS. RIMS was enhanced in the 1980's; a handbook produced and the name changed to RIMS II to differentiate it from the original version. RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the distribution of the inputs purchased and the outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's
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regional economic accounts, which are used to adjust the national I-O table in order to reflect a region's industrial structure and trading patterns. RIMS II multipliers can be estimated for any region composed of one or more counties and for any industry or group of industries in the national I-O table.
 Input-output analysis is a standard method for RED analysis but requires significant resources.
To effectively use the multipliers for impact analysis, users must provide geographically and industrially detailed information on the initial changes in output, earnings, or employment that are associated with the project under study. The multipliers can then be used to estimate the total impact of the project on regional output, earnings, or employment. BEA can help to measure economic impacts in an area of interest. RIMS II is widely used to analyze the economic impact of projects and events on state and local areas.
The *Recreation Economic Assessment System* is a model for conducting regional estimates of the impact of recreational visitor spending. REAS was developed by the state of Michigan and modified by the Engineering Research and Development Center (ERDC) for application in the Corps. It is designed to provide a simple, accurate way of applying appropriate multipliers to spending and visitation data. It includes direct effects, aggregate secondary effects and marginal effects. Multipliers are sector specific. REAS is specifically designed to assess RED effects to the region, versus NED analysis which focuses on the value of an experience to the individual visitor.
3. Measurement.
Current guidance offers the following on measurement and metrics for RED effects:
“The positive effects of a plan on a region’s income are equal to the sum of the NED benefits that accrue to that region, plus transfers of income to the region from outside the region.
The positive effects of a plan on regional employment are directly parallel to the positive effects on regional income . . .
To the extent practical, planning reports should provide reasonable estimates of the composition of increased employment according to relevant service, trade, and industrial sectors, including a separate estimate for agriculture.
The relationship between the affected regional economies and the national economy should be recognized. Since the NED account registers all effects on the national economy, any differences
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between the regional and national economic effects of a plan take the form of transfers from the rest of the nation.
Effects that cannot be satisfactorily quantified or described with available methods, data and information or that will not have a material bearing on the decision making process may be excluded from the RED account."
In the next portion of this document, 4. Suggested Procedure, recommended RED measurement techniques are provided. Other methods may be used if well documented and defensible. Current guidance suggests exploring innovative methods. Model certification must be considered when choosing analytical techniques. A certified model with input data specific to the region will be required when the model certification process has been fully implemented. Some parameters may be of interest in more than one account, e.g., income may be an RED and OSE consideration, albeit from different perspectives. It is vital to separate NED and RED effects on income and employment. In all cases, the analyst must bear in mind that with and without analysis will be applied to the RED account in order to appropriately determine project impacts. A manual on RED will be developed and will include a full range of measurement techniques.
 With and without analysis are key to reliable RED evaluation.
Local sponsors, states and other organizations often have a strong interest in the RED account and expect a project study to yield specific information about local and regional fiscal impacts. It may be possible to develop this, and other data of local interest, as part of the RED analysis with little additional effort. It is important that study participants understand the boundaries of RED analysis and its use in alternative evaluation.
 The team must clearly understand the use and limits of the RED account.
One aspect of measurement deserves a special mention—data. Data needs for RED analysis, particularly input-output modeling, may be daunting—costly and difficult to obtain. BEA offers advice and options for dealing with this in RIMS II or local university resources may be helpful in providing data.

4. Suggested Procedures

The RED account displays changes in the distribution of regional economic activity as a result of each alternative plan. Regional income and employment are the measures of economic activity most commonly used. The regional economic impact of recreation is a subset of these categories which is calculated separately as illustrated below. The definition of the region is the area within

which income and employment effects are significant. The absolute level of effects is of less importance than the relative impact on the region.
 Both positive and negative effects must be identified.
Key parameters for RED analysis are:

- NED and RED must be clearly defined and differentiated.
- Effects on regional employment are expected to be parallel to effects on regional income and should be calculated and displayed so the two are consistent.
- Negative income and employment impacts should not be overlooked.

a. Input-Output modeling Effective planning for public-and privatesector projects and programs at the State and local levels requires a systematic analysis of the economic impacts of these projects and programs on affected regions. In turn, systematic analysis of economic impacts must account for the inter-industry relationships within regions because these relationships largely determine how regional economies are likely to respond to project changes. Regional input-output (I-O) multipliers, which account for inter-industry relationships within regions, are useful tools for conducting regional economic impact analysis.

I-O modeling is a complex procedure. ER-100 specifies that “Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output and population.” This has lead to the use of RIMS II, developed and supported by the DOC, BEA as a respected, standardized methodology for I-O analysis. Use of RIMS II requires significant data input on project induced changes in earnings and employment. This level of effort and sophistication will not be needed on all studies. RED estimates for smaller studies may be pursued in conjunction with regional universities. The proposed methodology will be reviewed early in the study process and clearly displayed and explained in the report.

RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the industrial distribution of inputs purchased and outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table to show a region's industrial structure and trading patterns.

Using RIMS II for impact analysis has specific advantages. RIMS II multipliers can be estimated for any region composed of one or more counties and for any industry, or group of industries, in the national I-O table. The accessibility of the main data sources for RIMS II keeps the cost of estimating regional multipliers

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relatively low. Empirical tests show that estimates based on relatively expensive surveys and RIMS II-based estimates are similar in magnitude.

BEA's RIMS multipliers can be a cost-effective way for analysts to estimate the economic impacts of changes in a regional economy. However, it is important to keep in mind that, like all economic impact models, RIMS provides approximate order-of-magnitude estimates of impacts. RIMS multipliers are best suited for estimating the impacts of small changes on a regional economy. For some applications, users may want to supplement RIMS estimates with information they gather from the region undergoing the potential change. Examples of case studies where it is appropriate to use RIMS multipliers appear in the RIMS II User Handbook.

To effectively use the multipliers for impact analysis, users must provide geographically and industrially detailed information on the initial changes in output, earnings, or employment that are associated with the project under study. The multipliers can then be used to estimate the total impact of the project or

program on regional output, earnings, and employment.
RIMS II is widely used in both the public and private sector. It is often used by state governments for transportation analyses. The ongoing development and support of the BEA, including a user handbook, make it the preferred choice for a large RED analysis.
For more detail on RIMS II, see Section V, Supplemental Information A, or the BEA web site *http://www.bea.gov/regional/rims.*

b. Recreation Economic Assessment System The *Recreation Economic Assessment System* is a model for conducting regional estimates of the impact of recreational visitor spending. REAS was developed by Michigan State University's Park, Recreation and Tourism Resources Department. It was modified by ERDC (in conjunction with one of the original developers) for application in the Corps. It is designed to provide a simple, accurate way of applying appropriate multipliers to spending and visitation data. It includes direct effects, aggregate secondary effects and marginal effects. Multipliers are sector specific. REAS is specifically designed to assess RED effects to the region, versus NED analysis which focuses on the value of the recreational experience to the individual visitor. It calculates tax impacts for the region which is usually a key interest of regional officials and publics.

 Recreation spending may be an important factor in RED evaluation.

Features of REAS include:

- Automated calculation, saving, printing, and charting.
- Summary report- Model automates converting results into a short report.

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- Detailed estimates of direct effects for sales, jobs, income and value added.
- Aggregate estimates for all secondary effects.
- Marginal effects- Report impacts per thousand dollars of visitor spending and per 1,000 person-trips.
- Tax effects of direct sales and income.
- Charts for spending and visitation data.
- Built-in spending profiles- Model provides sets of spending profiles from past surveys.
- Sector-specific multipliers- model provides four sets of "generic" multipliers for 12 sectors that were estimated from IMPLAN.
- Model handles margins and local productions for purchases on goods.

REAS is a corporately supported and maintained Corps of Engineers tool. This methodology is also used by the National Park Service and the Forest Service. The REAS model is available on the Natural Resources Management Gateway *http://corpslakes.usace.army.mil/employees/economic*

c. Other Methods

Other well known and respected I/O models are IMPLAN, EIFS, REIM, and Port Kit. These will be addressed in detail in the RED handbook.

IMPLAN is a generic I/O modeling system which includes software and data. It is available privately and requires training to use successfully.
www.implan.com

EIFS is a generic economic base model which provides general regional economic impacts. It was originally developed to assess the impacts of base closures. It is available through Clark-Atlanta University.
REIM is a privately owned system. You can pay for access to run scenarios but limited information is provided on how the system actually performs the analysis. www.remi.com
Port Kit is a product of the Maritime Administration. It is designed to perform impact analyses for small to medium ports. It is available for purchase from the National Technical Information Service at a nominal cost.
 A RED handbook is in development.

B. Other Social Effects

 "The other social effects account registers plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts."

1. Introduction and Background

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This section includes information on current guidance in ER-100, past approaches used in the Corps and other Federal agency approaches for determining OSE. A Plan of Action that outlines research needed to develop final, analytically comprehensive procedures for OSE has been developed as a separate document. Is content is summarized in part IV of this document.

 There are many ways of defining OSE effects.

There are seemingly limitless lists and nomenclatures for OSE. This document includes three OSE protocols developed or used by the Corps at various times (ER 100; P&G; and Social Effects Indicators developed by the Waterways Experiment Station (WES)). In addition, two other protocols are included: National Oceanic and Atmospheric Administration (NOAA) Human Dimensions of Coastal Restoration and a think piece on the Human Costs of Flooding. The framework of each of these five items is discussed later in this document.
Other robust sources (see bibliography) which may be drawn upon are:

- Department of Interior (DOI), Bureau of Land Management
- Council on Environmental Quality update of the NEPA handbook, social indicators
- U.S. Department of Agriculture (DA), Forest Service
- HAZUS-MH (FEMA) www.fema.gov/plan/prevent/hazus/index.shtm
- Environmental Protection Agency (EPA), particularly the Brownfields Initiative and Science Advisory Board on valuing environmental services
- NOAA's social science initiative and the vast wealth of academic research. Dr. David Loomis of the University of Massachusetts has a well established program with extensive work on Federal government actions. He has been instrumental in NOAA's work.

Similar to the RED account the OSE account has also waxed and waned in significance in Corps planning over the last 30 years. The current guidance on OSE in planning for Corps projects is contained in ER 100, Appendix D, Amendment 1, 30 June 2004. Included are comments on the use of the OSE

account; the OSE categories of effects--urban and community impacts; life, health and safety; displacement; long-term productivity and energy requirement and energy conservation—discussion of measurement standards and detailed discussion by category of effect.

 OSE effects often are described qualitatively rather than quantitatively. Measurement of OSE effects is generally to be qualitative (beneficial/adverse, positive/negative). Quantitative or numerical data is encouraged within available and accepted methods.

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2. Frameworks

Current guidance and P&G include very similar categories of effects. The primary differences are the lack in P&G of the categories of educational, cultural and recreational opportunities and emergency preparedness. It appears that the current guidance was based very closely on the 1978 WES document; there are many instances of identical nomenclature. Current guidance does not restrict OSE considerations to the list of effects provided. The list reflects items commonly of importance to communities and which are most likely to be affected by projects. Other categories of OSE effects may be included in planning reports if they are relevant to a specific project. There is no distinction by business lines although certain effects are more closely correlated with certain business lines than others. Generally, the list is slanted toward economic (income, employment) issues of individual/community concern. There is potential for consideration of a wider range of social effects.

The list developed by WES in 1978 provides the most detailed list of overall OSE categories. The two major objectives of this document were to provide: “(1) a comprehensive listing of variables relevant to the social well-being objective of water-resources planning; and (2) descriptions of measurement of the variables deemed most salient for social well-being impact assessment of water and related land-management studies.” This report was prepared during the brief time that Principles and Standards was the primary planning guidance and the OSE account was termed the social well-being account. The account is defined by categories, subcategories and variables in increasing level of detail (for complete list refer to Section V Supplemental Information C – OSE Data Sources). The list is more detailed than P&G or current guidance. It has a discussion of each variable which includes definition and measurement of baseline conditions; predictions of future conditions for the variable; prediction of impacts—what to measure and how to measure it; data sources and references. Although dated, much of the discussion is still useful and the format is easy to use. An electronically based update of this document is being considered as a future work product.

 OSE (commonly titled Human Dimensions) is currently of great interest in many agencies and the academic community.

The think piece on the Human Cost of Flooding is a basic prototype for placing a dollar value on the trauma associated with flooding. It was designed for use as a category of NED benefit (Note: This approach has not been approved as a NED benefit by HQUSACE, it is provided only as an example of potential factors which

may be appropriate for some projects.). The methodology could be adapted to a variety of natural disasters. The approach relies on vetted measures developed by the American Medical Association (impairment classification) and the Veteran's Administration (impairment payment scale).
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The remaining framework considered was developed by NOAA's Coastal Ocean Program as part of their Decision Making Analysis Series. The framework is included in the document Science Based Restoration Monitoring of Coastal Habitats, Volume 2, Tools for Monitoring Coastal Habitats, chapter 14, Human Dimensions of Coastal Restoration. This document is focused on monitoring of coastal restoration projects. Monitoring occurs long after project planning but many of the OSE factors of interest are the same as those evaluated in the project planning process. (See Supplemental Information B. for a full list of the factors included.) The goals of monitoring (from this NOAA document--ensure that restoration is successful, further the science, and increase the efficiency of future restoration efforts) also contribute to better project planning. The inclusion of human dimensions in restoration monitoring reflects NOAA's emphasis on social science as an integral part of and important tool for coastal work. As the Corps' environmental restoration mission matures, this topic is increasing in importance. The document was developed using a peer review process and the human dimensions chapter is co-authored by a leading academic expert. It includes extensive, current bibliographies by topic as well as an associated experts list.

 NOAA's Human Dimensions work can be found at www.csc.noaa.gov/socialscience and humandimensions.gov (site in development).

3. Measurement

Current guidance offers the following on measurement and metrics for OSE effects:

"With emphasis on their incidence or occurrence, beneficial effects on social well-being are contributions to the equitable distribution of real income and employment and to other social opportunities. Since they are integrally related to the basic values and goals of society, these effects are usually not subject to monetary evaluation. The normal market exchange process, however, produces monetary values which can be utilized to aid in measuring distributional impacts of plans on real incomes.

In evaluating well-being effects the obtaining of detailed breakdowns and analytically useful correlations relating to various indicators, index numbers, and similar comparative statistical indicators, as well as dollar values where possible, presents many complex definitional, data and measurement problems. Consequently, planning studies should explicitly recognize the limitations of present methods and explore innovative approaches to the identification and measurement of the social well-being effects. Such procedures should be carefully documented in the report."
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In the following Recommended OSE List of Categories of Effects, a

measurement technique is listed for each of the effects. Other methods may be used if well documented and defensible. Current guidance suggests exploring innovative methods--"planning studies should explicitly recognize the limitations of present methods and explore innovative approaches to the identification and measurement of the social well-being effects." Some parameters may be of interest in more than one account, e.g., income may be an RED and OSE consideration, albeit from different perspectives. In all cases, the analyst must bear in mind that with and without analysis will be applied to the OSE account in order to appropriately determine project impacts. A manual on OSE will be developed as a future effort and will include a full range of measurement techniques.

 Census data and the use of indices may help in performing an efficient OSE analysis.

One aspect of measurement deserves a special mention—scale. Some parameters of OSE may be difficult to assess or monitor for individual or small scale projects. The NOAA publication on Human dimensions of Coastal Restoration identifies parameters most likely to be suitable for assessment regardless of project size or scope and those more likely to be meaningful at the river basin or watershed levels.

 See Section V. Supplemental Information C. for a list of OSE data sources.

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4. Suggested Procedures

The following table shows the OSE categories of effects contained in the current guidance (ER 100 on the left). The categories of effects that are also included in the lists from P&G, WES and NOAA are marked with an x under those sources. Some discretion was used to interpret the nomenclature in the various lists. (For a complete display of the effects included in WES and NOAA lists, see Section V Supplemental Information B.)

OSE Categories of Effects

Planning Guidance Notebook (**ER 1105-2-100) P&G WES NOAA**

• **Urban and community impacts** x x
Real income x x
Employment distribution (especially share to minorities) x x
Population distribution x x
Population composition x x
Fiscal condition of State and local sponsor x x x
Educational, cultural and recreational opportunities x x
• **Life, health and safety** x x x
Reducing risk of flood, drought and other disasters x x x
Reducing the number of disease-carrying insects x x
and other pathological factors
Reducing concentration/exposure to water and air pollution x x x
Providing a year-round choice of food that contributes
to the improvement of national nutrition
Estimate of number of lives saved x x
(only with strong historic record)
• **Displacement** x x
People, businesses and farms x x
• **Long-term productivity** x x

Maintenance and enhancement of productivity of resources x x
such as agricultural land.
• **Energy requirements and energy conservation** x
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P&G WES NOAA
• **Emergency preparedness** x
(not listed as one of the major categories in the introductory list)
Protecting major components of the x
National water transportation system x
Flexible reserves of water supplies x
Critical power supplies x
Reserve food production potential x x
Conservation of scarce fuels
Dispersal of population and industry x
International treaty requirements x

a. Recommended OSE List of Categories of Effects The following list is recommended for use in screening OSE factors in implementation of EC 409. It represents a broad range of interests which are likely to be relevant to water resources planning. Other factors may be added if of particular significance for a specific project.

 The public, as well as the team, may have important input on which factors will be of importance.

Income and Employment

Measure positive or negative**;** quantitative

• Income Opportunities
  o Personal Income
  o Income dispersion
  o Income stability
• Labor Force Characteristics
  o Economic activity of the population
  o Employment distribution (especially to minorities)
  o Labor/job stability
  o Occupational distribution
• Fiscal Condition of State, regional and local government

Life, Health and Safety

Measure positive or negative; qualitative

• Personal Health and Safety
  o Risk of injury
  o Morbidity, especially exposure to water and air pollution
  o Mortality
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  o Population segment differences in health and safety
• Safety of Property
  o Risk of property damage
  o Effects of damage on quality of life
  o Population segment differences in risk to property
• Institutional Protection
  o Adequacy of medical facilities and personnel

- Adequacy of emergency protection
- Population segment differences in access to institutional protection

Educational, Cultural and Recreational Opportunities

Measure quantitative/qualitative

- Educational Opportunities
  - School enrollment
  - Protection of educational facilities
- Recreational and Cultural Opportunities
  - Recreational and cultural participation
  - Diversity of recreational and cultural opportunities
  - Adequacy of recreation areas and cultural opportunities

Emergency Preparedness

Measure quantitative

- Water Transportation Needs
  - Waterway Accessibility of Major Distributive Centers
  - Efficiency of the Water Transportation System
  - Water Transportation Protection
- Water Supply Needs
  - Quality of Water Supply
  - Quantity of Water Supply
  - Diversion Potential of Water Supply
- Power Supply Needs
  - Overload Capacities of Power Supply
  - Efficiency of Water-Related Energy Sources
- Protection of Infrastructure
- International Treaty Requirements
  - Compliance with Water-related Treaty Requirements

Community

Measure positive or negative; qualitative

- Community Ties
  - Strength of Community Identification
  - Community Values
- Community Homogeneity or Diversity
  - Socioeconomic Diversity
  - Ethnic Diversity

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  - Age Diversity
- Displacement
  - People, businesses and farms
- Housing and Social Institutions
  - Housing Supply
  - Neighborhood Quality
  - Residential Stability

- Social Institutional Stability
- Housing Costs

• Other Community Services
- Adequacy of Water Supply and Utility Service
- Adequacy of Transportation Infrastructure
- Adequacy of Other Community Services

Population Characteristics

Measure quantitative

• Population Growth
- Population Size
- Population Density
- Net Migration
- Internal Migration

Aesthetics

Measure qualitative

• Resources
- Visual Unity
- Visual Compatibility
- View shed
- Fragility/Scarcity
- Naturalness

• Social
- Preferences
- Community Values

 For further reading http://papers.ssrn.com (Social Science Research Network)

IV. Future Efforts

If Collaborative Planning is to be used to its fullest potential--to implement true integrated water resources planning--it is critical that appropriate research be done to provide the field with reliable and credible tools.

The implementation of EC 409 has three phases: Phase 1 began with issuing the EC in July 05 and will conclude with publication of this document in mid 2006; Phase 2 consists of research and dialogue for the remaining months of the EC's 20

viability; Phase 3 is development of final guidance and technical manuals incorporating research results and field experiences.

A separate Plan of Action (POA) addresses research needed to develop final, analytically comprehensive procedures for RED and OSE. Two categories of items are addressed in the POA--short term needs and long term needs. The short term needs build on existing information and can be completed in less than a year while the long term needs include the development of tools which will require significant investments of time, effort and coordination or fundamental policy issues on which a dialogue needs to begin.

Items included in the draft POA are: Collaborative Planning Handbook; RED Techniques Manual; Outreach and Training on Collaborative Planning; OSE

Manual; OSE and RED by business lines; OSE, RED, EIS—Consistency and Integration; Theoretical Underpinning of OSE; Decision Making Tools for Collaborative Planning; Shared Vision Planning—field user version; Place Vulnerability—the Importance of Socioeconomics; Quality of Life as an Alternative to Willingness to Pay. Descriptions and other details on these items are found in the POA.

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V. Supplemental Information

A. RIMS II, REAS

RIMS

In the 1970's, the Bureau of Economic Analysis (BEA) developed a method for estimating regional I-O multipliers known as RIMS (Regional Industrial Multiplier System), which was based on the work of Garnick and Drake. In the 1980's, BEA completed an enhancement of RIMS, known as RIMS II (Regional Input-Output Modeling System), and published a handbook for RIMS II users. In 1992, BEA published a second edition of the handbook in which the multipliers were based on more recent data and improved methodology. In 1997, BEA published a third edition of the handbook that provides more detail on the use of the multipliers and the data sources and methods for estimating them.

RIMS II uses BEA's benchmark and annual I-O tables for the nation. Since a particular region may not contain all the industries found at the national level, some direct input requirements cannot be supplied by that region's industries. Input requirements that are not produced in a study region are identified using BEA's regional economic accounts.

The RIMS II method for estimating regional I-O multipliers can be viewed as a three-step process. In the first step, the producer portion of the national I-O table is made region-specific by using six-digit NAICS location quotients (LQ's). The LQ's estimate the extent to which input requirements are supplied by firms within the region. RIMS II uses LQ's based on two types of data: BEA's personal income data (by place of residence) are used to calculate LQ's in the service industries; and BEA's wage-and-salary data (by place of work) are used to calculate LQ's in the nonservice industries.

In the second step, the household row and the household column from the national I-O table are made region-specific. The household row coefficients, which are derived from the value-added row of the national I-O table, are adjusted to reflect regional earnings leakages resulting from individuals working in the region but residing outside the region. The household column coefficients, which are based on the personal consumption expenditure column of the national I-O table, are adjusted to account for regional consumption leakages stemming from personal taxes and savings.

In the last step, the Leontief inversion approach is used to estimate multipliers. This inversion approach produces output, earnings, and employment multipliers, which can be used to trace the impacts of changes in final demand on directly and indirectly affected industries.

Empirical tests indicate that RIMS II yields multipliers that are not substantially different in magnitude from those generated by regional I-O models based on

relatively expensive surveys. For example, a comparison of 224 industry-specific
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multipliers from survey-based tables for Texas, Washington, and West Virginia indicates that the RIMS II average multipliers overestimate the average multipliers from the survey-based tables by approximately 5 percent. For the majority of individual industry-specific multipliers, the difference between RIMS II and survey-based multipliers is less than 10 percent. In addition, RIMS II and survey multipliers show statistically similar distributions of affected industries.

REAS

The following tables are samples from a standard REAS analysis.

Sector/Spending category
Motel, hotel cabin or B&B
Camping fees
Restaurants & bars
Groceries, take-out food/drinks
Gas & oil
Other auto expenses
Other boat expenses
Entertainment and recreation fees
Sporting goods
Souvenirs and other expenses
Other services
Other merchandise
Retail Trade
Wholesale Trade

Economic measure
Output/Sales ($ Millions)
Personal Income ($ Millions)
Value Added ($ Millions)
Jobs

M ultiplier Lookup Table

Group 1: Rural
Smaller rural regions with low population (below 30,000).
Low sales multipliers and high job to sales ratios
Representative regions: DWORSHAK DAM & RESERVOIR, NIMROD LAKE, BLUE MOUNTAIN LAKE

Group 2: Small Metro
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Larger rural regions or small metro areas with population up to 500,000. Regions with smaller populations that serve as population centers of the surrounding areas may fit into this category.
Low to medium sales multipliers and medium to high job to sales ratios.
Representative regions: LAKE OUACHITA, MILFORD LAKE, (WOLF CREEK DAM) LAKE CUMBERLAND

Group 3: Large Metro
Medium to larger metro areas with population up to 1,000,000. Regions with smaller populations that serve as population centers of the surrounding areas may fit into this category.
Medium to high sales multipliers and medium to low job to sales ratios.
Representative regions: LEWISVILLE LAKE, LAKE SIDNEY LANIER, J PERCY PRIEST DAM AND RESERVOIR
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B. OSE Factor Lists

1. Refer to Planning Guidance Notebook, ER 1105-2-100

2. Refer to Principles and Guidelines
3. Miscellaneous Paper Y-78-2, Profile and Measurement of Social Well-Being Indicators for Use in the Evaluation of Water and Related Land Management Planning, Patricia K. Guseman and Katheryn T. Dietrich, Texas A&M University, June 1978
Contract monitored by Environmental Laboratory, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
Real Income Distribution
• Income Opportunities
o Personal Income
o Income dispersion
o Income stability
o Sources of income
• Labor Force Characteristics
o Economic activity of the population
o Labor force diversity
o Labor/job stability
o Occupational distribution
o Accessibility of work
• Income Expenditures
o Major consumer expenditures
o Discretionary Income
o Taxes
• Subjective Satisfaction
o Satisfaction with life quality
o Job satisfaction
o Satisfaction with family income
Life, Health, and Safety
• Personal Health and Safety
o Risk of injury
o Morbidity
o Mortality
o Population segment differences in health and safety
• Safety of Property
o Risk of property damage
o Effects of damage on quality of life
o Population segment differences in risk to property
• Institutional Protection
o Adequacy of medical facilities and personnel
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o Quality of medical care
o Adequacy of protection against crime
o Adequacy of emergency protection
o Population segment differences in access to institutional protection

Educational, Cultural and Recreational Opportunities and Other Community Services

- Educational Opportunities
  - School enrollment
  - Educational achievement
  - Adequacy of educational services
  - Diversity of educational services
  - Satisfaction with educational opportunities
- Recreational and Cultural Opportunities
  - Recreational and cultural participation
  - Diversity of recreational and cultural opportunities
  - Adequacy of recreation areas and cultural opportunities
  - Satisfaction with recreational and cultural opportunities
  - Population segment differences in access to recreational and cultural opportunities
- Other Community Services
  - Adequacy of Water Supply and Utility Service
  - Adequacy of Public Transportation
  - Adequacy of Other Community Services

Emergency Preparedness

- Water Transportation Needs
  - Waterway Accessibility of Major Distributive Centers
  - Efficiency of the Water Transportation System
  - Water Transportation Protection
- Water Supply Needs
  - Quality of Water Supply
  - Quantity of Water Supply
  - Diversion Potential of Water Supply
- Power Supply Needs
  - Overload Capacities of Power Supply
  - Efficiency of Water-Related Energy Sources
- Reserve Food Production Potential
  - Food Reserve Potential
- Dispersal of Population and Industry
  - Dispersion of Water Supply Sources
  - Dispersion of Waterways
- International Treaty Requirements
  - Compliance with Water-related Treaty Requirements

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Community Cohesion

- Community Ties
  - Strength of Community Identification
  - Community Participation Process
  - Community Values

• Community Homogeneity or Diversity
  - Socioeconomic Diversity
  - Ethnic Diversity
  - Age Diversity

Other Population Characteristics

• Population Growth
  - Population Size
  - Population Density
  - Dispersion Around Population Centers
  - Net Migration
  - Internal Migration

• Housing and Social Institutions
  - Housing Supply
  - Neighborhood Quality
  - Residential Stability
  - Social Institutional Stability
  - Housing Costs

Population Characteristics

• Population Growth
  - Population Size
  - Population Density
  - Net Migration
  - Internal Migration

Aesthetics

• Resources
  - Visual Unity
  - Visual Compatibility
  - View shed
  - Fragility/Scarcity
  - Naturalness

• Social
  - Preferences
  - Community Values

4. Think Piece-- Human Costs of Flooding

(could be updated and broadened to encompass a variety of natural disasters)

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16 Sept 05 fax from George Antle to Bob Pietrowsky

• Context
  - Affects individuals as state of shock
  - Affects population as loss of community
  - Indicators of ability to deal with impacts—age; income level
  - Indicators of severity of impact—time to clean up; flood damage vs. household income

• Categories of Effects

- Miss work
- Worry
- Anxiety
- Evacuation
- Health problems
- Mental attitude
- Concern for family members
- Professional medical help
- How long to return home
- How long to resume usual life
- Fear of bad weather
- House looted
- Degree of neighborliness

• Measure
- AMA impairment classification
- Veteran's Affairs payment scale based on degree of impairment
- Categorize individual trauma on AMA classification
- Monetize by relating to VA payment scale

• Philosophy
- Trauma reduces economic capability
- "Willingness to pay" to avoid trauma is an NED benefit
- AMA scale can be linked to VA payments
- VA scale is proxy of nation's "willingness to pay" to impairments
- Cumulative effects?
- Community impacts?
- How long do effects persist? (i.e., icon that brings back experience when reminded of it).

5. NOAA Coastal Ocean Program, Decision Making Analysis Series, no. 23, Volume 2

Science Based Restoration Monitoring of Coastal Habitats, Volume 2, Tools for Monitoring Coastal Habitats

• Community Related
- Presence in Community Master Plan
- Component of Town Meetings

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- Attendance at Town Meetings
- Community Communications
- Volunteerism (number of persons)
- NGO Activity
- Town Use of Restored Coastal Area
- Town Portion of Cost Sharing
- Corporate Sponsorship
- Zoning Changes
- Tax Incentives

- Community Member Attitudes

• Property Damage Related
- Flood Zone Map
- Number of Losses
- Disaster Relief Costs
- Direct Cost of Damage Income Level
- Insurance Losses
- Uninsured Losses
- Reduced Insurance Cots
- Expenditures on Non-Restoration Projects (i.e. coastal armament)

• Education Related
- Number of Interpretive Centers
- Number of Interpretive Programs
- Number of Research Projects
- Number of Students Trained
- Cost of Research Projects
- School Field Trips
- Classroom Activities
- Association With Museums
- Informal Education: Media coverage, websites, brochures, kiosks, workshops and public forums

• Human Health Related
- Health Advisories
- Fish Advisories
- Shellfish Advisories
- Drinking Water Advisories
- Number, Area and Duration of Beach Closures
- Incidence of Disease
- Level of Compliance With Water Quality Standards
- Level of Reduction in BioToxins
- Number of Hazardous Sources
- Number and Area of Algal Blooms
- Duration of Algal Blooms
- Number of Hypoxia Events

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- Number of Water-Borne Illnesses
- Level of Food Safety

• Commercial Fishing Related
- Number of Commercial Dock Facilities
- Total Profits
- Number of Jobs
- Total Value of Harvest
- Sustainability of fishery
- Cultural/Historical Heritage Preservation

• Other Social Values
- Property Values
- Appraised Value
- Market Value
- Viewscape quality
- Acres of Land Preserved/Open Space
- Preserved Natural/Historic/Cultural Values
- Level of Existence Value
- Level of Bequest Value
- Level of Option Value
- Historic Designation
- Tribal Designation

Measure

• **Coastal Recreation, Tourism and Access Related Goals**

Increase Number of Recreational Opportunities (pg 16)
Increase the Level of Recreation Activity (pg 16)
Increase the Quality of Recreational Opportunities (pg 17)
Improve Tourism/Ecotourism (pg 17)
Enhance Access to Coastal Resources (pg 17)

• **General Social and Non-market Values Related Goals**

Enhance Community Investment (pg 23)
Enhance Educational Opportunities
(pg 29)
Protect or Improve Human Health (pg 30)
Protect Traditional/Cultural/Historic Values (pg 36)
Enhance Non-Market Values (pg 41)
Improve Aesthetic Values (pg 41)

• **Market-based Goals**

Improve General Market Activity (pg 43)
Reduce Property Damage (pg 46)
Enhance Property Value (pg 46)
Enhance Transportation and Commerce (pg 51)
Improve Commercial Fisheries/Shellfisheries (pg 54)
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Non-consumptive users (birders, beach users,
divers/snorkelers, boaters, hikers)
Recreational Fishing Catch Indicators
Catch rates
Average size per fish
Availability of preferred target species
Number of trophy fish caught
Annual Recreation Visitor Days
Consumptive days (hunting, fishing, shellfishing, trapping)
Non-consumptive days (birding, beach use,
diving/snorkeling, boating, hiking)
Watchable Fish and Wildlife Counts

Economic Indicators
Economic Expenditures
Economic Impacts
Employment Impacts
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C. OSE Data Sources

The following table provides a list of social effects variables and potential data sources. The social scientist performing the assessment should explore and adjust according to the unique conditions of each work effort.

Social Effects Assessment Variables and Data Sources

Variable Category	Variables of Interest	Data Sources
Community Social Profile Variables		
Population	Total population	U.S. Census
	Population % change	
Age	Median age	U.S. Census
	% 65 and above	
Education	% HS grads (age 25+)	U.S. Census
	% College grads (age 25 +)	
Race and Ethnicity	% White	U.S. Census
	% Black	
	% Other	
	% Persons of Hispanic/Latino origin	
Employment and Industry	Major industries	U.S. Census
	Unemployment rate	
Income and Poverty Status	Median H/H income	U.S. Census
	Persons below poverty %	
Housing Mix and Value	Housing units	U.S. Census
	Homeownership rate	
	Housing units in multi-unit structures %	
	Median value of owner occupied housing units	
Civic Infrastructure	Voter turn out in local elections/bond issues	Newspapers; county

government
Rankings on $
expenditures per
student, student
achievement tests,
acres of parks per
capita
County government
Post Event Social Effects Variables
32
Variable Category Variables of Interest Data Sources
Storm-Related Deaths Number of deaths
reported as storm
related expressed as
a per capita rate
National Weather Service,
Office of Hydrology, Flood Loss
Data Base
http://www.nws.noaa.gov/oh/hic
National Hurricane Center,
Tropical Prediction Center
http://www.nhc.noaa.gov/
Storm-Related Injuries Number of injuries
reported as being
storm related
expressed as a per
capita rate
Newspaper accounts
Disruption/Evacuation Numbers of persons
evacuated
Newspaper accounts
Family Disturbances Number of police
calls for family
disturbances
occurring by month
for the year following
the event, and for the
12 months prior to the
event
Police department records
Caseload of family
counseling and
mediation centers for
the year following the
event, and for the
year prior to the event

	Inquiries to community counseling and mediation centers	
Unemployment Claims	Number of claims occurring in each month of the 12-month period following the event expressed as a rate, and for the 12 months prior to the event expressed as a rate	State/ county employment office, workman's compensation data base
Crime	Numbers of crimes by type occurring in each month of the 12-month period following the event expressed as a rate,	Police department records

Variable Category	Variables of Interest	Data Sources
	and for the 12 months prior to the event expressed as a rate	
Divorce	Number of petitions for divorce occurring in the year following the event, and for the year prior to the event, expressed as per capita rates	County court house records
Recovery Period	Social Effects Variables	
Population Changes Experienced	Changes 2000–2005 Population change, total %, % 65+, % white, black – totals, and broken down by census tracts/zip codes	U.S. Census 2005 data

Employment Changes Experienced	
Employment rate over time, plotted monthly.	
Unemployment claims by month.	State/ county employment office
Number of businesses; major employers	Chamber of Commerce
Income and Property Values	
2000–2005 % of persons living in poverty	Census; state records
Volume and sales prices of residential property by month	Real Estate MLS
Civic Infrastructure Changes	
Number and type of public and NFP organizations	Directories (e.g., Chamber; telephone)
Community vision and outlook for future	Newspapers, county web sites
Community improvement efforts underway	Newspapers, county web sites
Community participation rates in elections	Newspaper, county web sites

D. Bibliography

RED References

• **"The Variation of Estimated Impacts from Five Regional Input-Output Models**," Brucker, Sharon M., Steven E. Hastings, and William R. Latham III, International Regional Science Review 13 (1990): 119-39.

• **"Differential Regional Multiplier Models,"** Garnick, Daniel H. Journal of Regional Science 10 (February 1970): 35-47; and Ronald L. Drake, "A Short-Cut to Estimates of Regional Input-Output Multipliers," International Regional Science Review 1 (Fall 1976): 1-17.

• **"Regional Economic Development Benefits: Issues, Findings and Suggested Actions"** Robinson, Dennis P., unpublished document, Institute for Water Resources, Alexandria, VA.

• **Regional Input-Output Modeling System (RIMS II): Estimation, Evaluation, and Application of a Disaggregated Regional Impact Model** U.S. Department of Commerce, Bureau of Economic Analysis, (Washington, DC: U.S. Government Printing Office, 1981). Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; order no. PB-82-168-865; price $26.

• **The Detailed Input-Output Structure of the U.S. Economy, Volume II** U.S. Department of Commerce, Bureau of Economic Analysis, (Washington, DC: U.S. Government Printing Office, November 1994); and U.S. Department of Commerce, Bureau of Economic Analysis, State Personal Income, 1929-93 (Washington, DC: U.S. Government Printing Office, June 1995).

OSE and Evaluation References

• **Community and Quality of Life: Data Needs for Informed Decision Making** National Academy Press 2002
Combination of theory and application with chapters focused on each. Oriented to transportation. Well organized for focus on various parameters—emphasizes livability.

• **Environmental Valuation in Europe series** editors Clive Spash and Claudia Carter 2000 Concerted Action, European Commission coordinated by Cambridge Research for the Environment
Series of 12 pamphlet type (20 pages) documents on key topics in environmental valuation. Excellent introduction to philosophy, issues and analytical approaches. Selected topics—natural capital, conceptualizing
35
sustainability, environmental quality and the value of life, value transfer, concepts of value.

• **HAZUS-MH** (FEMA) is a useful geographically based tool to assess damages, including OSE. Available at www.fema.gov/plan/prevent/hazus/index.shtm

• **Human Links to Coastal Disasters** The H. John Heinz Center for Science, Economics and the Environment 2002

• **Linking Human Benefits to Barrier Island Restoration in Louisiana** Pontchartrain Institute for Environmental Science
Oct. 2004 Workshop

• **Measuring Ecosystem Service Benefits: The Use of Landscape Analysis to Evaluate Environmental Trades and Compensation** Jim Boyd and Lisa Wainger April 03 Resources for the Future Discussion Paper http://rff.org/

• **Miscellaneous Paper Y-78-2** Waterways Experiment Station June 1978

Part of Water Resources Assessment Methodology to assist in environmental impact assessment. Addresses Social Well Being account.
List of variables (tiered by category, subcategory and variable), ways to measure, how to predict.

• **Multi-Criteria Decision Analysis: Comprehensive Decision Analysis Tool for Risk Management of Contaminated Sediments** I LInkov, S. Sahay, G Kiker, T. Bridges, T.P. Seager, D.A. Belluck, A. Meyer draft, submitted to Risk Analysis, February 2005

• **National Ocean Economics Project**

• **No Adverse Impacts: Partnering for Sustainable Flood Plain Management** Association of State Flood Plain Managers Conference 2005 See National Nonstructural/Flood Proofing Committee web site for presentations
Topics—partnering, environmental sustainability, no adverse impacts, watershed approach, innovation and restoration and conservation as opportunities for flood plain management. Historic preservation and flood proofing example.

• **People Power: The Social Side of Watershed Restoration** http://www.fs.fed.us/wildlandwaters/newsletters/wildlandwaters_spring06.pdf

• **Perspectives on Biodiversity: Valuing its Role in an Ever Changing World** National Research Council 1999
36
Economics and environmental integrated.
Somewhat academic but thorough, concise discussion of a wide range of factors related to biodiversity.

• **Science Based Restoration Monitoring of Coastal Habitats volume one** Terry McTigue NOAA (Chapter 14 Human Dimensions of Coastal Restoration) 2005
Series responding to the Estuaries and Clean Water Act of 2000 (PL 160-457) Lots of information. Matrix of goals, parameters to monitor—many also applicable to initial project evaluation. Bibliography, glossary, list of human dimensions experts.

• **Spatial Trends in Coastal Socioeconomics** Percy Pacheco and Peter Wiley NOAA 2005
Web site http://stics.noaa.gov
Time series, geo-referenced demographic data 1969-2001. Includes data analysis and display tools.

• **Sources of Information for Social Profiling** IWR report 77-9, Dec. 1977 (done by U. of Kansas, Cynthia Flynn and Rosemary Schmidt)
Addresses Social Impact Analysis for EISs re NEPA requirements. Lists variables, indicators, priority (importance of variable), source and time and cost to collect. Sources may be out of date, but variable list is useful.

• For further reading http://papers.ssrn.com (Social Science Research Network)

• **A Step By Step Guide to Conducting a Social Profile for Watershed Planning** University of Illinois, Department of Natural Resources and

Environmental Science. 2006..
http://www.watershedplanning.uiuc.edu/index.html
• **Valuing Ecosystem Services: Toward Better Environmental Decision-Making** National Academies of Science November 2004
Multi agency sponsored study. Identifies methods for assigning value to ecosystem services—tangible and intangible. Stress collaboration between ecologists and economists.

Return

Army Corps of Engineers and the USGS announce a collaborative effort for sharing Geospatial data

EDP Weekly's IT Monitor, Jan 17, 2005

SANZ Inc. (OTCBB:SANZ) Geospatial Solutions Group, a provider of spatial data provisioning solutions, has announced the completion of the implementation of its EarthWhere Spatial Data Provisioning software for the U.S. Army Corps of Engineers (USACE)--Albuquerque District, Albuquerque, N.M. By enabling access to vital imagery datasets, this implementation will facilitate inter-agency collaboration between the U.S. Army Corps of Engineers, the U.S. Geological Survey (USGS) Rocky Mountain Mapping Center, as well as a number of other partners (including federal, state, county, city, university, and tribal agencies).

Collectively these organizations have jurisdictional responsibilities for planning and implementing restoration-oriented projects in the Rio Grande valley in Albuquerque. The primary focus of this joint data provisioning effort is a series of multi-agency projects situated in the riparian woodland area of the Rio Grande (or "Bosque"). EarthWhere's use through an interagency agreement between USACE and USGS provides a method for hosting project datasets at the USGS's Rocky Mountain Mapping Center in Denver.

Project data is housed at the USGS Rocky Mountain Mapping Center and is accessed by each of the stakeholders using the EarthWhere Web-based interface. The collaboration between USGS and USACE highlights efforts underway by several agencies in the federal government to share existing assets and expertise in geotechnology. The USGS is providing the hosting infrastructure along with access to digital aerial and satellite imagery sets unique to the Bosque study area, as well as their archived geospatial datasets of over 30 terabytes (TBs) of imagery. The EarthWhere system provides USACE and its stakeholders with immediate access to critical data over the Internet. Rocky Mountain Mapping Center's system has been operational since January 2003. Return

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This handbook explores ways that the Corps District planner can identify opportunities to collaborate throughout all phases of the planning process. The handbook briefly touches on collaborative activities across Federal agencies, at the regional level, and at the project level in order to inform the District planner that these resources are available for use. The handbook also encourages the District planner to initiate collaborative activities with others as appropriate during the planning process to produce plans that cross Federal agency missions and authorities. Cost-sharing among collaborating partners is also discussed.

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