

# ECO-PCX ECOSYSTEM RESTORATION (ER) PLANNING SMART PAPER: DEVELOPING PROBLEM AND OPPORTUNITY STATEMENTS

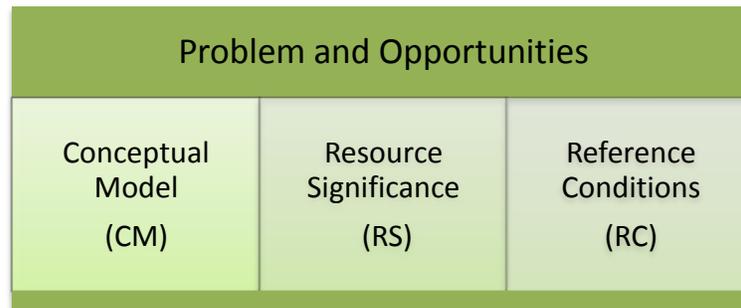
## INTRODUCTION

The National Ecosystem Restoration Planning Center of Expertise (ECO-PCX) developed a series of Planning SMART Papers to increase planners' awareness of planning issues specific to Ecosystem Restoration (ER) studies/projects. This effort is part of the Planning SMART Guide Development. The intent of the series is to bring attention to possible stumbling blocks that may arise during an ER study and provide tips and techniques to avoid them. A common area of critique in ER studies is Problems and Opportunities (P&O) Statements. The purpose of this paper is to provide tips and best practices for developing problem and opportunity statements.

## PROBLEM AND OPPORTUNITY STATEMENT DEVELOPMENT

The tips presented below should not be considered guidance but rather advice to advance the state of practice in ER planning. Focusing effort on developing sound P&O statements early in the process can assist the team in moving through the planning process more efficiently. To develop problem and opportunities statements for an ecosystem restoration study, teams should focus on three key components. The basis for the statements should be a **conceptual model**, **resource significance** discussion, and **reference conditions** discussion as shown in Figure 1. These components are the foundation supporting well-developed P&O statements. Addressing these components can happen quickly for the first iteration of the planning process and be refined throughout the study.

Figure 1. Problems and Opportunities Framework



Teams may be hesitant to take the time to focus on these items. However, subject matter experts contend that concentrating effort on them is worth the time. Deliberate discussion of these basic ecosystem restoration tenets can advance a study quickly and effectively and add little additional burden to the process. If done in concert with the Vertical Team it can provide a common framework for understanding the path forward and help reduce revisiting details which can cause delays. At a minimum, teams should be situationally aware of these items and be prepared to address them either in the report of during workshops or charrettes.

**ECO-PCX ECOSYSTEM RESTORATION (ER) PLANNING SMART PAPER:  
DEVELOPING PROBLEM AND OPPORTUNITY STATEMENTS**

**Conceptual Model (CM)**

The term *Conceptual Model* is a widely accepted term in the field of environmental science and research. Engineering Research and Development Center/Environmental Benefits Analysis Technical Note -08-1 [The Application of Conceptual Models to Ecosystem Restoration](#) provides this definition:

*“Conceptual models are descriptions of the general functional relationships among essential components of an ecosystem. They tell the story of “how the system works” and, in the case of ecosystem restoration, how restoration actions aim to alter those processes or attributes for the betterment of the system.”*

Conceptual *Ecological Model* (CEM) is the term used when discussing a CM that focuses on an ecosystem. The main purpose of a CEM is to provide a graphical representation of the ecosystem’s function. The term *model* can bring to mind complicated spreadsheets and exhaustive computer analysis but in simple terms ***it’s a depiction of how something is perceived to work***. As such a CEM is a logical starting point in the planning process and provides support throughout the process. [CECW-CP Memorandum – Policy Guidance on Certification of Ecosystem Output Models \(Aug 13, 2008\)](#) recommended the development of CEMs for all ecosystem restoration projects. Although the use of CEMs is not a requirement, teams are encouraged to use them to advance the state of practice. It should be noted that there is not a certification or approval requirement for CMs/CEMs. Beginning the planning process with the development of a CM can help illustrate important system processes, attributes and cause-effect relationships, synthesize current understanding of system functions, isolate and help diagnose significant environmental challenges, and provide insight into potential outcomes of restoration actions within the project area. It fosters a common understanding of how a system works, what led to the degradation, and how proposed restoration actions address the problems. In general, the CEM should be able to answer the question:

***Can you affect structure, function, and/or the dynamic processes of the study area?***

A conceptual model should be as simple as possible to foster the necessary understanding. The product can be a simple graphic with brief narrative that describes stressors and drivers.

✓ Check out [Environmental Benefits Analysis Conceptual Models](#) link on the Civil Works Environment Gateway for details.

**ECO-PCX ECOSYSTEM RESTORATION (ER) PLANNING SMART PAPER:  
DEVELOPING PROBLEM AND OPPORTUNITY STATEMENTS**

**Resource Significance (RS)**

It is essential that the team understands and is able to demonstrate the significance of the ecosystem that is being restored. An authority to perform an investigation should not be construed as an indicator of a high level of significance. Political influences can overshadow a project's true importance and create possible complications. The team is responsible for sorting through, characterizing, and disclosing these conflicts early in the study. Simply put, Federal funding for investigations is currently extremely limited. Therefore, critical discussions regarding significance of the subject ecosystem; scope, scale, and complexity of the study and possible solutions; and the potential to identify implementable solutions capable of yielding meaningful benefits should happen early on in a study. The Resource Significance discussion should answer the questions:

***Why should the Federal Government invest funds on this type of restoration at this location? Is this something that a local or regional entity should implement instead?***

The team should focus on the significance of the various resources that would be restored. RS should be described by components of the ecosystem. The Institute for Water Resources Report 97-R-4: [Resource Significance Protocol for Environmental Project Planning](#) is available online to as a learning resource. It is recommended that teams use the matrix provided in IWR Report. The three bases for significance are shown in Figure 2.

*Figure 2. Bases for Significance*

Although the purpose of the decision document is for requesting authorization, the use of the terms used for performance based budgeting (appropriation) in the significance discussion can also help frame the towards Federal Interest. Five ecosystems have been designated by the Administration as *Priority Ecosystems* for FY13 budgeting purposes. The Corps has added another five ecosystems based on budgetary priorities. Teams working on studies outside of the priority ecosystems should be aware of this. Demonstrating the significance of the study area is essential to the success of a study.

***Institutional***

- Significance based on institutional recognition means that the importance of an environmental resource is acknowledged in the laws, adopted plans, and other policy statements of public agencies, tribes, or private groups.

***Public***

- Significance based on public recognition means that some segment of the general public recognizes the importance of an environmental resource.

***Technical***

- Significance based on technical recognition means that the importance of an environmental resource is based on scientific or technical knowledge or judgment of critical resource characteristics.

✓ Check out *Ecosystem Restoration (ER) Planning Smart Paper: Resource Significance and Its Tie to Performance Based Budgeting* for details.

## ECO-PCX ECOSYSTEM RESTORATION (ER) PLANNING SMART PAPER: DEVELOPING PROBLEM AND OPPORTUNITY STATEMENTS

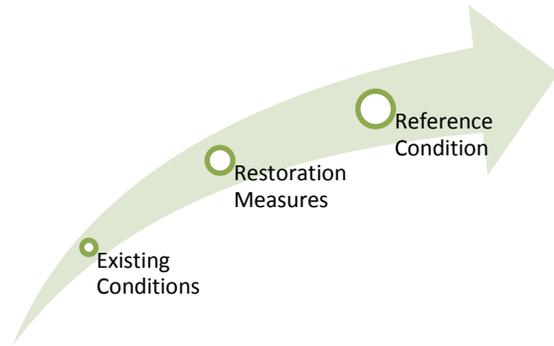
### Reference Conditions (RC)

Ecosystem restoration planning requires teams to characterize degradation that has occurred (or will occur) and change that is expected to result from proposed restoration measures, with associated benefits of those changes. A benchmark - a characterization of state, trend, or range of conditions representative of the ecosystem of interest - can be used to help the team understand what changes in system characteristics might be necessary to achieve the desired future condition. This can be particularly helpful in communicating which attributes of a naturalistic, functioning, and self-regulating system are being reestablished via restoration of significant ecosystem function, structure, and dynamic processes that have been degraded.

This is the basic premise of using reference conditions in ER Planning.

Though the use of RC concepts is not explicitly required by Corps Planning guidance, it is recommended that they be applied in ER studies. The term *reference* is basically a point of conceptual, spatial, or temporal comparison – a site,

condition, state, process, function, etc. – to which the team can use for to gain a common understanding of the ecosystem. This shared understanding of the ecosystem’s structure and function and characterization of reference condition can influence how the team formulates planning objectives and alternatives, benchmarks future ecological conditions, evaluates performance and sustainability, and seeks to justify investments.



A *reference ecosystem* can be defined as one or more existing, former, or hypothetical ecosystems that serve as a guiding image for ecosystem restoration studies. The reference ecosystem is often thought of as the “best” representation(s) of the ecosystem. For example, a team may determine how severely an ecosystem has been altered by comparing the existing study area to a standard (real or virtual) representing a non-altered or slightly altered condition. A *reference condition* is the set of values or characteristics of the reference ecosystem. These attributes set the standard for restoration at a site and might be expressed as a range or index such as a habitat suitability index (HSI), a known threshold such as a limiting temperature, or a measured rate of some process expected in that setting. In other words, beginning with an end (or a range of ends) can help focus a team’s efforts on a path to achieving the goals of a study.

- ✓ Check out ERDC Tech Note [Reference Concepts in Ecosystem Restoration and Environmental Benefits Analysis \(EBA\): Principles and Practices\\*](#) for details.

\* At time of publication of this paper, this tech note has not been published.