Chapter 3: **Goals and Objectives**

Goals and objectives (G&Os) are the foundation for all restoration projects. Developing good goals and objectives entails the careful consideration of site-specific characteristics. Often, restoration goals and objectives are shaped not only by the ecological conditions at the site but also by stakeholder interests in the project. Identification of goals and objectives directly informs the project design, construction, and scientific evaluation and allows for a more efficient and focused restoration process.

This chapter of the manual includes discussion of:

- The importance of goals and objectives;
- Methods for establishing goals and objectives;
- Common tidal hydrology restoration goals and objectives; and
- Goals and objectives highlight project: Hopedale Tidal Hydrology Restoration Project, St Bernard Parish, Louisiana.

Additional resources for goals and objectives, as well as a summary of recommendations from this chapter, can be found in the ***Toolkit*** (page 176).

Stakeholder Interests Impact Restoration Goals and Objectives

Goals and objectives of the 15,100-acre South Bay Salt Ponds Project in California have accommodated a range of stakeholder interests. Many project partners focus on bird habitat restoration; NOAA is primarily interested in fisheries habitat, while other stakeholders advocate public accessibility. An example of how these divergent interests were incorporated into the goals and objectives was the creation of areas with varying water depths to support targeted bird and fish species, as well as a range of associated recreational activities.

For more information on setting goals with partners, see **Chapter 2: Project Identification, Feasibility, and Planning**

Importance of Goals and Objectives

Clear goals and objectives provide the project team with the appropriate boundaries necessary to make decisions about the project and to expand the number of alternatives available to achieve the objectives (Steyer 2000).

However, establishing goals and objectives is often overlooked (National Research Council 1992, 1994) due to the misconception that all project team members have the same vision of the restoration project outcomes. However, given the range of potential partners, it is likely that the project team will have divergent interests.

Project G&Os should be referenced during all phases of implementation, as they establish the project priorities and intended outcomes. Failure to define G&Os can result in a number of obstacles to project efficacy and efficiency that will resonate from project design through construction and scientific evaluation.

Why are G&Os important to the design phase?

Goals and objectives:

- Aid in comparison of alternative design scenarios by helping the team create an effective cost-benefit analysis and choose the best design to achieve desired project outcomes.
- Help avoid confusion and disagreement among project team members when choosing a project design.

Community residents, frustrated with declining conditions at Bishopville Pond in Worcester County, MD, teamed up with resource professionals to develop goals and objectives that eliminate aesthetic and water quality issues while restoring tidal flows beyond the existing dam..

Photo Credit: © Google 2007; Satellite imagery by U.S Geological Survey

- Allow for a more efficient design process, saving time and reducing project costs. Communication between the project team and the designer or engineer will be more efficient.

- See ***Chapter 4: Project Design*** for more detail.

Why are G&Os important to the construction phase?

Goals and Objectives:

- Aid in making decisions about the most appropriate on-site design modifications. Delayed decisions can increase costs. Misguided decisions can impact project outcomes.

- Allow the construction contractor to participate in construction modifications through an improved understanding of the desired project outcomes.

- Help the project team choose the appropriate parameters to measure during the as-built monitoring (See ***Chapter 7: Scientific Evaluation and Monitoring***).

- Allow for **adaptive management** approaches for projects, or "learning by doing" (Walters 1986), in a structured rather than haphazard way" (Thom et al. 2005). Adaptive management protocols can increase the likelihood of reaching G&Os since they allow for necessary changes that may occur during or after the construction phase (see ***Implementing Adaptive Management***, page 20). See ***Chapter 6: Construction and Maintenance*** for more detail.

Implementing Adaptive Management

Adaptive management is an iterative approach to managing ecosystems, where the methods of achieving the desired objectives are unknown or uncertain (Holling 1978; Walters 1986). Using this approach, information gained through project monitoring is incorporated into future management actions. During the project planning stage, adaptive management should be used to refine goals and objectives and make changes to design plans as necessary. In the construction stage, adaptive management should be used to evaluate the need for changes to the original plans for specific components of the project, e.g., the number and types of plants, the configuration of channels or grading, or the amount of new soil brought to the site.

The Sandpiper Pond Tidal Hydrology Restoration Project in Murrells Inlet, South Carolina, utilized adaptive management to achieve project goals. The project was originally designed to restore historic tidal flow to a small, isolated estuary by constructing an ocean inlet. After construction, it became apparent that the restored flows were inadequate to meet water quality goals. To address this challenge and meet the original water quality expectations, the project team designed and constructed an additional tidal connection in a new location.

For more information about adaptive management, see the references provided in the **Toolkit** *(page 179).*

Why are G&Os important to the scientific evaluation phase?

- Well defined G&Os will drive scientific evaluation of project outcomes. Reference sites, data collection, target values, and monitoring parameters should reflect specific G&Os (Diefenderfer et al. 2003). Since data collection should begin long before construction, the early development of G&Os is critical to implementation of a strong scientific evaluation plan (see ***Chapter 7: Scientific Evaluation and Monitoring***).

Defining Project Goals and Objectives

- The **goal**, or vision, of a project is a general statement of the desired long-term ecological or biological outcomes (IWWR 2003). A goal statement should be simple and clear. Project **objectives** should be derived from the goal statement, defining specific, measurable targets. One goal may generate multiple objectives. Worksheets to help develop G&Os are available in the ***Toolkit*** (pages 177-178). Below is an example goal statement with three specific objectives statements.

Example:

Goal:

Re-establish a tidal connection through a spoil levee in order to restore salt marsh structure and function.

Objective 1:

Achieve tidal flooding of the marsh at a periodicity and depth comparable to nearby reference marshes within six months post-construction.

Reference marsh:

Semi-diurnal flooding periodicity; average flooding depth 0.4m

Target for restored marsh:

Semi-diurnal flooding periodicity; average flooding depth 0.4m +/- 0.1m

Objective 2:

Achieve an average surface water dissolved oxygen of 7.2 mg/L within six months post construction.

Reference marsh:

Dissolved oxygen 7.2 mg/L +/- 1.0 mg/L

Target for restored marsh:
Dissolved oxygen 7.2 mg/L +/- 1.5 mg/L

Objective 3:
Create habitat for six species of fish within one year post-construction

Reference marsh:
12 species of fish

Target for restored marsh:
Six species of fish within one year

Tips for developing goals and objectives:

- Consider a wide range of project objectives and prioritize those objectives according to the needs or desired outcomes of the specific project. Prioritizing objectives can help the project team analyze the cost-benefit of various design alternatives and determine the best use of limited funds for scientific evaluation. Prioritization can also be used to develop restoration phases in the event that full funding is not immediately available to complete implementation in one phase.

- Do not define G&Os too narrowly. Narrow objectives may result in a project that inadvertently slights one ecological function in favor of another. For example, a culvert of a certain size may be adequate to inundate an area of land, but may not be appropriately sized to allow for fish passage. Blending multiple objectives may result in wider constituent support.

- Consult local stakeholders when defining G&Os. Salt marsh restoration goals should reflect perceptions and values of residents, especially in areas of high population density (Casagrande 1997). Scientific working groups, regional planning documents, universities, and community planning organizations are potential resources.

- Recognize that objectives may change over time as community values or the site itself changes. This is not to suggest that objectives should be easily abandoned, but rather that project proponents should be realistic and flexible. Prioritizing objectives early in project planning will help the project team determine which project objectives can be more easily modified verses those that must be preserved.

Meeting Multiple Objectives

Flooding of private property due to restricted tidal connection spurred the initial interest in the Little River Marsh Restoration Project in New Hampshire. A partnership between the local community and stakeholders representing fisheries habitat resulted in a project design that met multiple objectives, including fisheries habitat restoration and flood control.

For more information, see the **Little River Marsh Restoration Project Portfolio** *(page 158).*

Two side-by-side 6x12 foot culverts replaced a 48-inch culvert connecting the Little River Marsh in New Hampshire to the Gulf of Maine.

Photo Credit: UNH

Goals and Objectives

PROJECT HIGHLIGHT

Hopedale Tidal Hydrology Restoration Project

Yscloskey, St. Bernard Parish, LA

The Hopedale Tidal Hydrology Restoration Project in St. Bernard Parish, Louisiana, was completed in 2004 with funding from the Coastal Wetland Planning, Protection, and Restoration Act (CWPPRA). The total project area is over 3,800 acres with approximately 719 acres of open water and 3,086 acres of brackish and saline marsh, bottomland hardwoods, and bottomland scrub/shrub. An inoperable water control structure installed during the 1950s was adversely affecting wetlands in the project area. The reduced draining capacity of the water control structure resulted in increased depth and duration of flooding events, thereby reducing marsh vegetation and accelerating marsh loss. Extreme tides occasionally entered the project area and became impounded upstream of the structure. The failed water control structure also blocked fisheries access to the wetland.

The goals of this project were clarified early: to re-establish tidal exchange, relieve impoundment conditions, achieve a healthy hydroperiod, provide fisheries access, and reduce wetland loss rates. However, multiple project team meetings were held to identify specific objectives that would influence project design and operational procedures. Specific hydrology objectives identified were to decrease the duration of flooding events to allow high water to stand on the marsh for no longer than one week following a flood event and to mimic the hydroperiod (depth and duration) and salinity regime of a reference marsh. In regard to wetland loss rates, the objective was to maintain 99 percent of the pre-construction acres of vegetated wetland within the project area for 20 years. (Given the rate of wetland loss in Louisiana, most projects set a much lower objective.) In regard to fisheries access, the objective was to maintain or improve fisheries ingress and egress.

The project team also established a monitoring plan that evaluates most of these objectives. Three continuous recorder stations are located within the project area and two are located in reference locations. These stations record water depth and salinity. Results indicate that salinity inside the project area is less than one-half of a part per thousand lower than outside, which does not have a likely biological significance. Water depths have decreased in the project area as compared to depths prior to project construction, and the duration of flooding events meets the established objective. Comparison of the hydroperiod between the project and reference site has proven to be complicated as water depths at reference locations have increased since project construction. Results for wetland loss rates will be analyzed by comparing aerial photography collected in 2000 to photography planned for 2012 and 2022. No specific measures of fisheries utilization are being collected since it is assumed that fisheries access has improved as a result of open fish slots in the water control structure.

For more information, see the **Hopedale Tidal Hydrology Restoration Project Portfolio** *(page 98).*

Left:
The water control structure installed at the Hopedale Project in Barnard Parish, Louisiana, incorporated three flap gates and two fish gates to improve hydrology and allow for fisheries access to more than 3,000 acres of wetland.
Photo Credit: NOAA

Below:
The goals of the Hopedale project in Barnard Parish, LA, were to re-establish tidal exchange, relieve impoundment conditions, achieve a healthy hydro-period, provide fisheries access, and reduce wetland loss rates.
Photo Credit: NOAA