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# COMMUNITY-BASED WATERSHED MANAGEMENT

## LESSONS FROM THE NATIONAL ESTUARY PROGRAM

FEBRUARY, 2005

## ***Chapter 4: Developing the Management Plan— A Blueprint for Action***

### **INTRODUCTION**

The Management Plan is a blueprint for restoring and protecting an estuary. Written by the estuary program office, with substantial input from stakeholder committees, it identifies the most pressing problems in an estuary and establishes goals, objectives, and actions for resolving them. The Management Plan also contains strategies for monitoring progress and financing implementation. The plans are living documents that are reexamined and revised by the estuary programs on a regular basis to ensure that the goals, objectives, and specific actions continue to address the most pressing problems. During plan development, the NEPs implement demonstration projects to test possible actions and show the results that full plan execution can bring about.

This chapter explains how the NEPs use the results of the Technical Characterization and Base Program Analysis discussed in **Chapter 3** to develop Management Plans that address the problems of each estuary. The chapter outlines how the NEPs involve affected jurisdictions, agencies, and other organizations and individuals in the writing of the plan to ensure stakeholder support and a commitment to implement the plan. The chapter also shows how the NEPs use demonstration projects during plan development to showcase innovative management strategies, involve the public, and demonstrate the types of changes that full implementation can bring about.

#### **NEP PRINCIPLES IN CHAPTER 4**

- The Management Plan identifies the most pressing problems in an estuary and establishes goals, objectives, and actions for resolving them.
- Implementation of demonstration projects during Management Plan development can showcase innovative management strategies, involve the public, and demonstrate the types of changes that full implementation of the Management Plan can bring about.
- The Management Plan must be developed in conjunction with affected jurisdictions, agencies, and programs to ensure continued stakeholder support and future implementation commitments.
- The Management Plan is a living document and should be revised on a regular basis (e.g., every five years) to ensure that the goals, objectives, and specific actions continue to address the most pressing problems and serve as effective tools for restoring and maintaining the integrity of the estuary.

## COMPONENTS OF A MANAGEMENT PLAN

The Management Plan contains five basic components:

- Statement of priority problems to be addressed in the Management Plan
- Mission statement, goals, and objectives for the estuary
- Action plans for achieving goals and objectives
- Monitoring strategy
- Finance strategy

The following sections describe these five basic components.

### STATEMENT OF PRIORITY PROBLEMS

Prioritizing the problems that will be addressed in the Management Plan is an important early step in Management Plan development. No Management Plan can tackle all of the issues affecting an estuary at one time. Therefore, problems must be prioritized to ensure that limited resources can be applied wisely during implementation of action plans. As discussed in **Chapter 3**, there are many strategies used to prioritize

identified problems in the estuary, including opinion surveys, stakeholder workshops, and various resource valuation techniques. The actions within the Management Plan should be clearly linked to the priority problems.

**SAN FRANCISCO  
ESTUARY PROJECT  
MISSION  
STATEMENT**



*“WE, THE PEOPLE of California and the San Francisco Bay-Delta region, believe the San Francisco Estuary is an international treasure and that our ongoing stewardship is critical to its preservation, restoration, and enhancement. Acknowledging the importance of the estuary to our environmental and economic well-being, we pledge to achieve and maintain an ecologically diverse and productive natural estuarine system.”*

For additional information, see [www.abag.ca.gov/bayarea/sfep/sfep.html](http://www.abag.ca.gov/bayarea/sfep/sfep.html).

### MISSION STATEMENTS, GOALS, AND OBJECTIVES

Most NEPs develop a mission statement, goals, and objectives to help ensure that stakeholders work toward the same end. This approach focuses participants on the desired end product rather than a problem-based approach that tackles individual problems one-by-one. A clear mission statement with specific goals and objectives leads to the development of integrated action plans that address multiple problems simultaneously in order to work toward achieving the desired end. This approach takes into consideration social as well as ecological factors and allows the NEPs to maintain direction in the dynamic environment in which they operate.

An NEP formulates the mission statement early in the program's development and may also formulate preliminary goals and objectives. After the Technical Characterization and Base Program Analysis are complete, the NEP revisits and refines the goals and objectives. Frequently, stakeholders are asked to identify the most important uses and resources of the estuary. This stakeholder input serves as an important basis for an NEP's program goals and objectives.

Overall program goals focus on desired end products or results for the estuary. All program goals should be environmentally meaningful and resonate with the public. Goals may range from maintaining current conditions to restoring the estuary to a past condition. Objectives, unlike goals, are specific and more clearly defined, and are aimed at achieving the broader, long-term goals. Objectives must be measurable and achievable through the implementation of specific action plans. They may reflect the environmental criteria, the preferred uses, or the elimination of impairments that the estuary program participants consider appropriate and desirable for various estuarine segments. Objectives undoubtedly will vary from one segment of the estuary to another, but in each case are used to determine if the program goals are being met.

#### ACTION PLANS

Once the Management Conference has formulated goals and objectives, work can begin on developing specific actions to achieve them. These action plans—discrete activities to address a priority problem or issue and its impacts—are at the heart of the Management Plan. **Table 4.1** (on page 42) summarizes the basic steps involved in developing action plans. Each action plan typically addresses a priority issue such as environmental education or a priority problem such as habitat loss.

**CLEAR GOALS AND  
OBJECTIVES HELP DEFINE  
SUCCESSFUL  
IMPLEMENTATION**



Measuring success can be simplified by defining goals and objectives in readily measured, unambiguous terms. One of the goals of the Tampa Bay Estuary Program is to restore a minimum of 100 acres of low-salinity tidal marsh every five years and a total of 1,800 acres over the long-term. The goal is stated in measurable terms and provides both long-term and intermediate-term measures of success. The goal statement also provides a clear endpoint to gauge when the goal has been achieved. The Interlocal Agreement through which the Tampa Bay Management Plan is being implemented specifies that when the policy board determines that a goal has been achieved, the goal will be restructured to provide ongoing maintenance of the resource. For additional information, see [www.tbep.org](http://www.tbep.org).



**Table 4.1: Basic steps for action plan development**

1. State the problem, identifying the probable causes and sources.
2. State the program goals related to the problem and its source.
3. Set specific, measurable objectives to attain the goals.
4. Determine the universe of possible management activities, both new and existing, for consideration.
5. Select the activity that will work, that the public will support, and that can be implemented within reasonable time and resources.
6. Establish specific action plans needed to abate and control the problem or to protect the resource.
7. Implement and monitor results, collecting data on measurable indicators of progress.
8. Report on progress, costs, and results.
9. Review, reevaluate, and redirect efforts as needed.

Each action plan should address the following:

- **WHO:** Identify who will take the lead in carrying out the action; define roles and resource commitments for each participating organization.
- **WHAT:** Describe what will be done. For example, set numeric load reduction targets and use designations for a location; describe which specific activities are necessary to reach them.
- **WHERE:** Describe the location where the action will take place and the area that will be affected.
- **WHEN:** Include schedules for action implementation and completion.
- **HOW:** Outline the procedures or steps that will be used to carry out the action.
- **HOW MUCH:** Estimate the cost of implementing the action.
- **SOURCE OF FUNDS:** Identify funding sources that can be used to carry out the action.

A range of techniques has been used by the NEPs to develop management actions. For example, the Lower Columbia River Estuary Partnership held multiple public meetings, convened work groups, used comparative risk ranking, conducted constituent focus groups, and then developed final criteria to narrow down a list of 180 actions to 43 (see **Appendix C**).

## MONITORING STRATEGY

In order to track both programmatic and environmental results, the NEPs develop a monitoring strategy. The NEPs include several basic elements in their monitoring strategies.

First, they include a clear and realistic definition of success. This definition is typically driven by the goals and objectives developed during the planning process. Considered in total, the achievement of these goals and objectives equates to the yardstick that the stakeholders will use to determine if progress is being made during the implementation process.

Second, the NEPs select appropriate and measurable indicators that track with this definition. Indicators are tools that are used to assess progress toward a particular goal or objective. The NEPs' indicators measure progress toward enhancing and preserving their diverse estuarine ecosystems. To reconcile the long-term nature of environmental improvements and the need to demonstrate short-term results to stakeholders, the NEPs integrate programmatic indicators with environmental indicators.

Third, the NEPs develop a communication plan. The plan identifies goals, objectives, and target audiences, as well as how the NEPs will create, package, and distribute their messages. One eye-catching way the NEPs use to reach a wide audience is Web-based interactive maps. This medium is a user-friendly way to track indicators and progress toward goals. For example, Performance Indicators Visualization and Outreach Tool (PIVOT), a tool developed by the National Oceanic and Atmospheric Administration Coastal Services Center, has been used by the Tillamook Estuaries Partnership to present local environmental issues and how the NEP is addressing them. Additional information on PIVOT can be found on the Web site: [www.epa.gov/owow/estuaries/pivot/overview/intro.htm](http://www.epa.gov/owow/estuaries/pivot/overview/intro.htm).

Next, the NEPs identify the roles environmental agencies and volunteers will play in monitoring. Environmental agencies bring substantial monitoring resources to the table, and volunteers can collect data in remote areas and help a program's outreach and education efforts. The NEPs convene the agencies that collect, analyze, and store estuary data to create a well coordinated monitoring program that eliminates redundancies and fills gaps. By combining local, regional, and national monitoring systems, the NEPs create a comprehensive network.



Finally, the NEPs outline the technical components of the strategy. The NEPs consult technical documents such as EPA's National Estuary Program Monitoring Guidance. The Guidance provides examples and details related to identifying monitoring objectives, establishing testable hypotheses, selecting statistical methods, choosing analytical methods and alternative sampling designs, evaluating expected monitoring study performance, and conducting monitoring and data analysis. The Guidance can

be found on the Web site: <http://yosemite.epa.gov/water/owrccatalog.nsf>.



Photo: Steve Delaney

### FINANCE STRATEGY

To successfully leverage federal seed money into substantial sums, the NEPs develop finance plans to obtain a variety of federal, state, local, and private funding. Finance plans allow the NEPs to tap into a broad spectrum of funding sources: public and private, direct and indirect, to

achieve their goals and control the pace of their programs. Rather than pursue a new grant each month, the NEPs identify and evaluate a broad spectrum of potential funding before seeking a particular source. NEPs attract additional funding from various sources and through partnerships with other organizations. For example, the NEPs have tapped the Clean Water State Revolving Fund program, stormwater utility fees, municipal bond funding, fines and settlements, tax abatements and incentives, and sales fees. The following paragraphs describe the finance planning process and the time it takes to see financial results.

Finance planning involves four steps: (1) establish program priorities; (2) identify funding options; (3) evaluate funding options; and (4) develop a plan to pursue the most promising funding sources. To accomplish these steps, the NEPs may retain a consultant to facilitate a series of meetings, interviews, and follow-up sessions to determine a reasonable list of priority actions and identify potential funding sources. The resulting plan identifies sources of funding to support priority activities, such as operating costs, outreach, and habitat protection. For example, the NEPs may seek funding from an individual state Environmental Trust by first educating the organization on how the NEP program goals will support their mission. Other organizations, such as foundations, local governments, and businesses, may also be approached to fund additional project-related costs. A finance plan identifies who will develop the funding mechanisms, how this will be done, and when the mechanisms will be in place. **Appendix E** provides an excerpt from one NEP finance plan.

It may take time to see positive results from finance planning and resulting actions. For example, the Partnership for the Delaware Estuary's first direct mail appeal yielded only a handful of responses. Yet as this NEP became more active in the community, developed support among local residents, and found advocates within state and local government, its reputation grew. With this stronger reputation, the NEP is now bringing in hundreds of thousands of dollars from a variety of sources and is in a better position to argue for more significant resources. The process of building this support took several years with small returns from early appeals blossoming into substantial support.

## **DEVELOPING THE MANAGEMENT PLAN**

Management Plan development is a multi-year process that seeks to involve all of the watershed's stakeholders. The NEPs take a number of steps to develop their management plans.

First, the NEPs disseminate and discuss the characterization findings with affected parties in the watershed. These findings, which describe the estuary's problems and link problems to causes, form the basis for developing the goals and objectives for the estuary. To ensure that stakeholders have equal access to this information, it should be widely shared in a format that all participants can understand.

Second, the NEPs gather information through public input, technical studies and demonstration projects. The stakeholders debate the merits of each problem and determine which ones will be the focus of the Management Plan. Some programs begin the prioritization process by holding a series of public workshops. These meetings serve to disseminate information on the state of the estuary and to increase public awareness and support for the estuary program. The meetings also provide an opportunity to solicit citizen knowledge and opinions regarding the problems of the estuary. The Management Conference uses this information to draft, evaluate, and select actions for controlling pollution and managing resources. By ensuring that the public is involved, a plan is created that all parties support. Actions are created that are measurable, achievable, and sensitive to social and cultural factors. Strong public support of the Management Plan helps to secure commitments from implementing entities, as well as funding for implementation.

Next, the NEPs integrate and coordinate their activities with affected jurisdictions, agencies, and



programs. Coordination with affected jurisdictions and agencies ensures that the estuary program is informed about the results of studies and research efforts conducted by other agencies, as well as initiatives that may be planned or underway that could impact the estuarine system. Continued involvement by resource agencies and affected jurisdictions also helps to ensure that commitments to implement the actions can be secured. Most NEPs include federal and state resource agency personnel on their Policy and/or Management Committees to ensure their participation throughout the process.

Finally, the NEPs begin implementing actions prior to completing the Management Plan. These early actions, referred to as Action Plan Demonstration Projects, are used by the NEPs to showcase innovative management strategies, to involve the public in hands-on estuarine resource management, and to demonstrate the types of changes that full implementation of the Management Plan can bring about. Early implementation activities can help to legitimize program activities and maintain a high level of stakeholder interest. The following are examples of Action Plan Demonstration Projects.



- The Indian River Lagoon NEP worked with state agencies and utilized volunteers to help protect natural habitat by planting mangroves in areas where there was habitat loss due to development or where the mangroves have been crowded out by the invasive species Brazilian pepper. Volunteers and contractors of the Indian River Lagoon Program planted more than 100,000 mangrove trees along causeways and shorelines of the lagoon. Young mangrove sprouts are planted in vertically split PVC pipes filled with native soils. This allows the roots to stabilize along the wave-turbulent shoreline. As the plants grow, the protective pipes fall away allowing the plant to survive without further support. This Action Plan Demonstration Project provided a useful technology and approach that was used by the NEP in the Management Plan.
- The Barataria-Terrebonne NEP implemented several Action Plan Demonstration Projects during Management Plan development to test the feasibility of new technologies prior to large-scale implementation. They included: 1) oil canal conversion; 2) seagrass best management practices; 3) seafood processing plant wastewater improvement; 4) small-flow wastewater treatment; and 5) alternative dredging and soil deposition. Following implementation, the program prepared reports on the results of each demonstration project.

- The Mobile Bay NEP funded an Action Plan Demonstration Project that was collectively implemented by the Alabama Coastal Foundation, U.S. Fish and Wildlife Service, McDavid Christmas Tree Farm, Cam Beckwith, and Alabama Power. The partners addressed the priority issue of habitat loss by placing discarded Christmas trees in fencing along an eroding shoreline. The trees absorbed wave action and reduced siltation. The Youth Conservation Corps planted black-needle rush (*Juncus roemerianus*) between the brush fence and shoreline. The marsh planting increases the rate of sediment entrapment, protects the shoreline from erosion, and augments wildlife habitat along the shoreline.

**STRAW VOTING TO IDENTIFY  
POSSIBLE MANAGEMENT PLAN  
ACTIONS**



The Partnership for the Delaware Estuary utilized straw voting exercises at stakeholder group meetings to determine levels of support for proposed actions. Following the voting exercise, a facilitator led a discussion about those actions with the highest level of support as well as those actions with the least support. These discussions not only helped to identify stakeholder priority actions, but also brought to light controversial issues, opinions on the feasibility of implementing actions, suggestions for action reformulation, and suggestions for additional actions. For additional information, see [www.delawareestuary.org](http://www.delawareestuary.org).

## FROM MANAGEMENT PLAN DEVELOPMENT TO IMPLEMENTATION

The Management Plan articulates a vision and goals for the estuary, identifies priority problems, specifies actions to address the problems, and outlines monitoring and finance strategies. While completion of the Management Plan requires many years of concentrated work, it is only the first step toward cleaning up and protecting the estuary. Implementation of the Management Plan becomes the focus of NEP efforts once it is approved by the Management Conference, state government, and EPA.

To successfully implement the plan, the NEPs need the skills, knowledge, and abilities to:

- raise funds,
- secure partner commitments,
- monitor progress,
- document and communicate results,
- provide public education and involvement opportunities, and
- revise the program to maintain momentum.

The next chapter discusses how the NEPs address these challenges.

## DEVELOPING THE MANAGEMENT PLAN: EXAMPLES

### ► *Example 1: Stakeholder involvement in development of the program vision*

The Partnership for the Delaware Estuary conducted a series of facilitated workshops to form a “vision of the Delaware Estuary for the year 2020 which was shared by the users of the estuary.” During facilitated discussions, workshop participants, representing a variety of stakeholder interests, were asked to identify the most important uses and resources of the estuary, based on their perspective as a user (e.g., fishing, recreational boating, land development, manufacturing, etc.). These workshops resulted in a collective list focusing on fisheries, wildlife, recreation, water supply, and commerce as the most important uses of the estuary. These uses and values became the basis for goals and objectives endorsed by the program. For additional information, see [www.delawareestuary.org](http://www.delawareestuary.org).

### ► *Example 2: Public involvement and community outreach demonstration projects*

The San Juan Bay Estuary Program conducted several community efforts to enhance education, health, and the environment. The Program delivered numerous presentations focusing on themes such as water quality. Demonstration Projects in Loiza, San Juan, and Catano communities included:

- A solid waste management project in Loiza that has reduced floatable debris through recycling and improved the overall environmental quality of the coastal community of Pinones.
- A series of 10 presentations and home visits, supplemented by the installation of warning signs, to alert Peninsula de Canteras Community to fish advisories.
- A 10-week series of workshops on Las Cucharills Marshland ecology, including sessions on community organizing and environmental restoration, that gave participants a coherent vision and ideas about how they could achieve it.



For additional information, see [www.estuariosanjuan.org](http://www.estuariosanjuan.org).

► **Example 3: Development of environmental education goals and objectives to help focus outreach efforts**

The Public Education Strategy of the Charlotte Harbor NEP is to educate and to motivate the people within the greater Charlotte Harbor watershed to understand, to participate in, and to implement their Management Plan. To achieve this strategy, the Charlotte Harbor NEP developed four public education goals and four quantifiable objectives to support the goals.

Public Education Goals:

1. Increase public awareness, understanding, and support of the action items in the Management Plan through involvement in educational programs, resource-based activities, and special events.
2. Establish and maintain environmental education efforts with organizations, educational centers, and government agencies.
3. Increase awareness and understanding of the natural and cultural resources of the Greater Charlotte Harbor Watershed.
4. Develop stewardship and a sense of shared responsibility for estuaries, rivers, tributaries, and their watersheds.

Public Education Objectives:

1. Maintain a core staff, including a Public Affairs Specialist, at the Charlotte Harbor NEP office to ensure implementation of the Management Plan.
2. Support and further the educational action items of the Management Plan.
3. Assess annually the progress of the Public Education Strategy.
4. Develop future directions based on the annual assessment.



Photo: Steve Delaney

Following the development of these objectives, priority actions were developed by the Program to define the management activities needed to attain the quantifiable objectives. For additional information, see [www.charlotteharborneep.com/](http://www.charlotteharborneep.com/).

► **Example 4: Use of resource valuation to gain public and political support**

The Peconic Estuary Program conducted a resource valuation study assessing the public's assessment of the estuary's values. The Program felt that a credible picture of the monetary worth of the natural resources and environmental amenities of the area would better substantiate the value of the actions in the Management Plan and broker more support from public officials and the general public. By documenting market and non-market resource benefits, decisions on resource allocation for implementation could be made at least in part on cost-benefit considerations. The multifaceted study



responded to the needs of the Peconic Estuary Program by identifying estuarine-dependent economic sectors and their impacts on the local economy and assessing the largely non-market values of natural amenities, and the recreational services provided by those amenities. The second part of the study was comprised of (1) a recreation study, (2) a resource valuation analysis, (3) a property value study, and (4) a wetlands productivity analysis.

The results of the resource valuation study indicated that the public has a strong attachment to the environmental and amenity resources of the Peconic Estuary system, even if they do not use the resources directly. The resource valuation survey identified the public's priorities for enhancing or preserving local natural resources. The relative priorities of respondents, in order, were farmland, eelgrass, wetlands, shellfishing grounds, and undeveloped land. The estimated per acre dollar values were about \$74,500 for farmland, \$70,000 for eelgrass, \$56,700 for saltmarsh, \$30,000 for unpolluted shellfishing grounds, and \$14,000 for undeveloped land, using a 25-year time horizon and a seven percent discount rate.

The economics information generated was extremely useful to the Program, presenting a credible picture of the market and non-market worth of the services provided by Peconic Bay and its environs. The results of the various studies conducted (the impact assessment, travel cost, and contingent choice) influenced several initiatives within the region and helped generate over \$100 million at the state, county, and local levels to support environmental preservation. For additional information, see [www.peconicestuary.org](http://www.peconicestuary.org).