

Producing Habitat Plans and Habitat Restoration Plans

A product of the Mid-Atlantic NEP Habitat Workshop
January 16-17, 2003
Ocean City, MD



Association of National Estuary Programs

Mid-Atlantic National Estuary Programs
Albemarle-Pamlico Sounds
Barnegat Bay
Delaware Estuary
Delaware Inland Bays
Maryland Coastal Bays

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Habitat Workshop

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Carousel Resort Hotel and Condominiums
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EXECUTIVE SUMMARY

The Association of National Estuaries Programs administered four regional workshops during 2003. The Mid-Atlantic Region chose as its topic area a workshop dealing with issues and solutions surrounding successful habitat planning and restoration. This document is a synopsis of the findings of a workshop held in January 2003 in Ocean City Maryland. At the workshop more than 50 participants came together to listen to formal presentations, meet in organized discussions sessions, and interact informally. The participants came from 5 states and the District of Columbia, and was comprised of Federal, state and local regulators and resource managers; NEP staff, volunteers, and board members; university staff and students; consultants; representatives of NGOs; private citizens and others.

The participants' comments have been organized into this document for the purpose of providing some guidance in planning for and preparation of habitat restoration plans. It provides useful ideas and information to aid those tasked with producing such plans. This document is not prescriptive, nor is it a "punch list" of items required for a successful habitat plan or restoration plan.

This volume is one part of the products of the workshop. Additional products include a "*Proceedings*", a web page, and a Compact Disk containing all of these products.

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INTRODUCTION

Estuaries

Coastal areas, known as estuaries, are productive ecosystems that form when freshwater flows into seawater to create brackish environments. Ecosystems at this intersection of land and ocean are generally acknowledged to provide many important functions, values, goods and services. These include commercial and recreational fisheries, transportation, aquaculture, recreation, habitat for many plants and animals, nutrient cycling and protection from storms. However, many of our estuaries are stressed from overuse. Only about 17 % of the Nation's land lies within coastal counties, but over 53 % of our population live within these counties and more visit these coastal areas for business, recreation and aesthetic enjoyment. The goods and services provided by coastal and estuarine habitat tend to be overused. Activities such as dredging, filling, navigation, mineral and gas extraction, altered salinity due to hydrological alterations, draining, bulldozing, paving, dams, toxic runoff, seepage and discharge, are increasing and can significantly contribute to coastal degradation. In response to the accelerated degradation of coastal areas, federal, state and private organizations have taken on the challenge to slow and ultimately reverse the trend. Federal agencies charged with land and water management such as Environmental Protection Agency (EPA), National Atmospheric and Space Administration (NOAA) and the US Army Corps of Engineers (COE), and numerous state agencies, have led the restoration effort.

Estuary Programs

EPA partnered with state governments in 1983 to formulate the first Chesapeake Bay Agreement to restore living resources of the Chesapeake Bay, the nation's largest estuary. The model proved so effective that it was expanded to other areas. Beginning with four pilot programs in 1985, The National Estuary Program (NEP) was established in 1987 by amendments to the Clean Water Act to "identify, restore, and protect nationally significant estuaries of the United States." The National Estuary Program uses local plans and actions to restore estuaries. The enabling legislation in the Clean Water Act, and many of the other sources of support for each NEP require clear plans with measurable outcomes to document the efficacy of each NEP's actions.

The Estuary Restoration Act, passed into law on November 7, 2000, was created to further promote the restoration of estuary habitat. The act seeks to promote restoration efforts by forging effective partnerships among public agencies and between the public and private sectors; providing financial and technical assistance for estuary habitat restoration projects; and, developing and enhancing monitoring and research capabilities. The Act established an interagency Council to carry out these directives, and required the Council to develop an Estuary Habitat Restoration Strategy with the goal of restoring one million acres of estuary habitat by 2010. The Act also directs NOAA to develop a national strategy for creating estuarine habitat and to develop monitoring protocols for estuary habitat restoration projects, and to create and maintain a National Database of Restoration Projects. The Habitat Strategy calls for restoration activities that improve degraded estuaries or estuarine habitat or those that create estuarine habitat with the goal of attaining a self-sustaining system that is integrated in to the surrounding landscape.

Habitats that are included in the Strategy consist of estuarine and freshwater habitats that form the complex physical and hydrologic features and living organisms within estuaries and their associated ecosystems. Estuarine habitats include salt and freshwater coastal marshes, coastal, forested wetlands and other coastal wetlands, maritime forests, coastal grasslands, tidal flats, natural shoreline areas, shellfish beds, sea grass meadows, and river stream corridors under tidal influence. Freshwater habitats that are estuarine associated ecosystems include: palustrine forested wetlands such as forested swamps or riparian zones; palustrine shrub wetlands and palustrine emergents including inland marshes and wet meadows

Association of National Estuary Program

The Association of National Estuary Programs (ANEP) is a non-profit organization comprised of the 28 NEPs. Its goal is:

“...promoting responsible stewardship and a common vision for the preservation and restoration of our nation’s bays and estuaries.” (ANEP 2003)

Habitat Workshop

ANEP received funding from the US Environmental Protection Agency for the purpose of organizing four regional workshops for which each region would select their workshop’s topic based on regional interest. The NEP members of the Mid-Atlantic Region which includes the Albemarle/Pamlico Estuary, the Barnegat Bay Estuary Program, the Delaware Inland Bays, the Delaware Estuary Program, and Maryland Coastal Bays Program elected to devote their workshop to establishing a protocol for preparing habitat plans that would be useful for documenting plans of action and accomplishments in the protection of local habitat. In January 2003, the Mid-Atlantic region held a workshop that provided a forum for scientists, university researchers, resource managers, regulators, private citizens and others to wrestle with the myriad issues of coastal habitat restoration and enhancement. The goals of the workshop were:

- Establish a framework on which to base habitat restoration plans.
- Establish measures of restoration success and criteria for prioritization of restoration efforts.

This document is part of the result of the January Workshop. It is meant to be a guide to the preparation of habitat restoration plans. Other products of the workshop include a proceedings document (Mid-Atlantic ANEP, 2003), a web site summarizing the workshop (Reilly Group, 2003), and a Compact Disk containing all of these items.

Participants

On January 16th and 17th, 2003, 54 individuals participated in a workshop held at the Carousel Resort Hotel and Condominiums in Ocean City, MD. The group was comprised of Federal, state and local regulators and resource managers; NEP staff, volunteers, and board members; university staff and students; consultants; representatives of NGOs; private citizens and others from 5 states and the District of Columbia. The list of participants can be found in Appendix 1, along with their contact information.

Methods

The workshop was devised to include formal presentations as well as opportunities for both formalized and informal interaction among the participants. Opening remarks were employed to set the tone for the workshop. A series of formal presentations was interspersed with facilitated breakout sessions and social interactions. The Workshop agenda, and summary of the formal presentations are available in both print and electronic format (Reilly Group, 2003 a & b).

Table 1 Topics of Discussion in the Habitat Workshop Sessions.

- Who should be involved or who identifies areas for restoration?
- How do we identify habitat for restoration or protection?
- How do we set restoration goals?
- How do we evaluate restoration activities?
- How do we measure successful attainment of restoration goals?
- When should our measurements be made?

The formalized breakout sessions were comprised of smaller groups of participants who were directed to consider a small topic area. Workshop participants selected the topics that most interested them. The topics of discussion from these breakout sessions are listed in Table 1. Each of the discussions was led by a facilitator to ensure careful and complete consideration of the topic, while remaining on topic. After the discussions were completed each group made a presentation to the entire group of workshop participants. Following the formal presentations and the presentations of the breakout session discussions, a final, facilitated session was held to gain consensus on the topics that should be included, and the format of this document, The Habitat Planning Guide - this document. Lastly,

a series of drafts were prepared, and reviewed by four of the workshop participants, and the executive director of ANEP.

PURPOSE OF HABITAT PLAN DEVELOPMENT

The purpose of a habitat plan is to provide a framework for planning and environmental restoration. Its use can help to identify and ensure success. A successful habitat plan will enable stakeholders to develop goals, habitat managers to set priorities and focus efforts in a consistent manner, and funding providers to see measured progress. By developing a habitat plan, priorities can be set and efforts can be focused to ensure comprehensive progress in the protection and restoration of habitat.

Habitat plans ensure a consistency of approach and help to ensure long-term progress towards habitat protection. Identification of new problems or opportunities can be dealt with within the framework of a comprehensive habitat plan, rather than precipitating major course change for habitat managers; the upshot being an increase in efficiency. Many of the funding sources already involved in habitat protection require measurable outcomes, progress reports, and demonstrated achievement of goals. In fact, current Environmental Protection Agency funding mandates development of a habitat plan. Future funding is even more likely to be linked to consistent achievement of measurable goals. By having a comprehensive habitat plan, specialized funding sources can be sought out to achieve specified goals, while windfall funding can be applied to goals that have already been set and agreed to by the major stakeholders.

There are other uses of a habitat plan that extend out from the originally identified habitat of concern. Since habitat plans for estuaries must have a watershed approach and an ecosystem-wide vision, other, external habitats in jeopardy, or external stressors to the subject habitat area can be identified, and targeted for protection or corrective action.

Habitat plans can be useful for other regional stakeholders and planners. The success of fisheries for example is largely dependent upon functioning and healthy ecosystems. Since the habitat plan can identify and preserve the functioning ecosystems and identify and restore damaged or impaired ecosystems, they can have utility for fisheries. Today's coastal economy is also largely tied to tourism. Effective habitat plans can enhance the aesthetic quality of habitat, and help coastal planners to responsibly interact with the environment that drives economic development.

WHO SHOULD USE THE PLAN?

The habitat plan is developed for the use of the resource managers. It is their compass for judging future activities, and lays out a plan for action. However, many other users should be considered in the construction of the habitat plan including funding sources who will review the plan or parts of it to decide if their resources fit with the goals of the plan. Other important users may include environmental policy makers, local planners, trade organizations, and others.

WHO SHOULD BE INVOLVED IN PREPARING THE PLAN?

The drafting of a habitat plan will require a panel of experts and the early and open input of stakeholders. Eric Buehl, the Habitat Coordinator for the Delaware Center for the Inland Bays gave a presentation concerning the selection of panel members for habitat plan development as a precursor to group discussions on the topic. The abstract of his presentation can be found in the Proceedings of this workshop (Mid-Atlantic NEP, 2003). The workshop participants who were assigned this discussion topic related several case studies where the planning process was halted near conclusion because a powerful stakeholder had been omitted from the early planning process. Involving as many stakeholders as possible in the early planning process empowers the panel charged with writing the habitat plan in two ways. First, those who participate in the habitat plan composition from the beginning will become advocates for the plan as well as advocates for the implementation of actions suggested in the habitat plan. Second, those stakeholders who begin, but for whatever reason drop out of the process, severely limit their ability to criticize the habitat plan at a later date.

The workshop devoted several sessions to the discussion of who should be involved with varying aspects of habitat plan development and implementation, and provided several suggestions for establishing a habitat plan. A habitat plan will require people with the skills listed in Table 2. The panel charged with developing a habitat plan should include people with as many of these skills as possible.

Table 2. Skills Required To Develop A Habitat Plan.

Find people that can provide these skills when selecting your panel.	Be sure to consider these factors when selecting your panel.
Local Knowledge	Science Background
GIS Skills	Implementers (participants who can make the plans happen)
Funding	Compatibilities within the working panel
Commitment	Political Considerations
Local Contacts	Power to stop/start the project
Design Capability	

In practice, however, habitat plan panels often are politically constructed with participation of certain members required by charter, funding, and political consideration. These required participants should be viewed as an asset to the process in that they will fill many of the skills required to develop the habitat plan. These political appointees will (or will represent those who) have the power to start or stop the project and the impetus to drive a project to completion. They will have the local contacts and local knowledge required to design and implement the habitat plan, and by extension may have access to the funds necessary for aspects of the habitat plan's suggested actions. Certain large and or powerful stakeholders may well be persuaded to supply persons with the more technical skills. For example, the participation of a local agency may be required as part of the funding mandate. However, this participation need not necessarily be the director of the agency. Alternatively, the participant on the panel could be an agency employee with GIS, design capability and scientific background. This participation could then be easily considered as part of their contribution to the project or as an "in-kind" donation.

The workshop participants further identified certain "types" of personalities that would enhance the performance of the habitat plan development panel if they were present in the proper balance. These include: dreamer/visionary; communicator/facilitator; someone familiar with rules and regulations; manager; "doers" (with multiple skills); and, implementers.

Habitat planning panels may become too large because of the desire to assemble an all-inclusive "dream team". The large size may be made more manageable by arranging the participants into subgroups within the overall panel. These subgroups could be tasked with accomplishing certain parts of the overall habitat planning process. However, this approach could have the detrimental effect of marginalizing certain stakeholders and undoing the inclusiveness required for success.

The workshop participants recommended that any habitat plan panel establish ground rules concerning stakeholder representation early in the process. Changes in who represents a particular agency or stakeholder has in some workshop participant's experience wreaked havoc with the process. The new representatives have not always shared in the commitment of the stakeholder or have a different agenda than the former representative, disrupting the process. These types of problems underline the need for on-going commitment from the stakeholder at a high administrative level.

WHO SHOULD IDENTIFY THE HABITATS?

In most cases there are few decisions to be made. The identification of the habitat is a part of the originating authority or budgeting process that establishes the program. Other habitats may be added as the stakeholders involved in constructing the habitat plan identify them. In some cases a habitat will identify itself as a necessary part of the habitat plan due to analysis of those forces impacting the primary habitat. For example, since the habitat plan should utilize a watershed approach, upstream portions of the same watershed may need to be added to the plan in order to accomplish the goals for restoration of the initially identified habitat.

HOW DO WE IDENTIFY HABITATS FOR RESTORATION?

In many cases the habitat slated for restoration are selected by the enabling legislation, or by the restricted funding of a grant. In other cases choices must be made to enable the limited funds available to be put to the most beneficial use. Identification of habitat that is ripe for restoration and that has a high probability for success can be done in many ways. Many restoration plans are already available from prior efforts and expertise and/or from projects proposed; yet not completed. Use what's gone before such as existing habitat plans, older topographic and tax maps, aerial photos, county records such as proffers and permit applications, etc.

Participants in the breakout session dealing with this topic suggested starting with a short list of cooperators to initialize the identification process. There is a risk of the appearance of having a *fait accompli*. However, the purpose of the exercise is to take what the initial group can produce as a straw man, and subject it to gap analysis as envisioned by USGS and later federally mandated since early 90s. Furthermore, it helps to determine the framework of what's out there; not necessarily what might be restored. Using this approach identifies the voids. This approach allows the constructors of a habitat plan to focus on many habitat areas and not just those areas of human bias (for example, the species humans see or harvest, and are biased towards). Gap analysis helps ensure critical habitat elements are adequately represented so they are included in the priority setting process.

The priority setting process helps those involved with constructing the habitat plan and, potentially, the public, to gain some ownership in the plan and increase their commitment. Workshop members suggested public input polls of specific lists of habitats could be useful. Keep in mind that polls can also be used to drive the process by selection of the questions. There was some consensus to use an overlay process in priority setting, possibly including a food web approach, as well as some of the landscape and GIS mapping presentations at the workshop (Reilly Group, 2003a). This would include scale questions and necessarily invoke as much historical --even anecdotal-- data as possible. Models exploring interconnections are a possibility. An example is marsh-detritus-plankton-menhaden to predators as a representative chain. Steve Emmett-Mattox, vice-president of Restore Americas Estuaries, presented the extent of restoration activities in estuaries across the nation. He highlighted numerous estuarine restoration activities and discussed pertinent restoration documents, e.g., "Principles of Habitat Protection", and "The National Strategy to Restore Coastal and Estuarine Habitat" and a compilation of funding sources, "Citizen's Guide to Federal Funding for Habitat Restoration" that are available through the NOAA website at <http://restoration.nos.noaa.gov>

Several of the formal presentations made at the workshop provided concrete approaches for prioritizing habitat for restoration. Mary Conley, of the Maryland Department of Natural Resources gave a talk entitled, "*What Resources Should We Protect - MD Sensitive Areas Initiative*" (Mid-Atlantic ANEP, 2003). This presentation detailed Maryland's efforts to rank aquatic sensitive areas for protection and restoration. Dr. Frederick W. (Rick) Kutz, a former scientist with the US Environmental Protection Agency and a consultant in environmental science presented a case for using GIS and specific targeting criteria to identify habitat likely to be successfully restored in his presentation entitled, "*Which Areas Should We Restore - More Bang for the Buck in Tributary Restoration Selection Strategy*" (Mid-Atlantic ANEP, 2003).

Roman Jesien, the Science Director for the Maryland Coastal Bays Program presented both a straw man proposal of a habitat selection plan, and a scoring sheet used by the Peconic Estuary Program when he tasked the workshop participants with their discussions. The Peconic Score sheets are included in the Proceedings of this workshop (Mid-Atlantic NEP, 2003).

A strong point was made in selecting sites that lend themselves to opportunities such as funding synergy, available public program initiatives, popular support, and willing landowners. This is often the fastest way to get projects on the ground and producing. Such early success stories help later projects along.

Whatever approach is used managers should be ready for critical decision points. Watch for changing natural conditions and environmental drivers. It's useless for example to hand plant SAV when there are massive schools of cow nosed rays or mute swans about.

As a bottom line in this consideration for a habitat plan, always keep an eye on which element is DRIVING the process, be it science, economics, or the policy/politics mix. Understand this or the project will be remembered for its mistakes.

WHAT SHOULD THE PLAN INCLUDE?

All the workshop participants took part in a session to determine the necessary components of a habitat plan. The list of elements that they developed is given in Table 3 and provides a good outline for the preparation of any habitat plan. While workshop participants agreed that each habitat plan should be a living document, there was a good deal of disagreement over whether to include a section dealing with modification to the habitat plan after the plan's development.

Table 3. Habitat Plan Sections

Introduction
General Goals
Users
Priority Areas
Actions (Plans)
Methodology
Time Line
Measurements/Monitoring
Supporting/scientific justification rationale
Impacts
Alternatives
Budget appendix (Optional Section)

A. Introduction

The introduction of the habitat plan should give the background, and answer basic questions such as the basis for generating a habitat plan, the expected audience, the area of interest, and any salient historical information. For example, is this habitat plan part of a larger effort or the beginning of planning for a specific Estuary Program?

B. General Goals

The plan should specify in general terms what the goals of the habitat plan are. This is the place for overarching goal statements such as "protect and enhance

the estuary” or “improve water quality.” This section should be clear and succinct, but not overly detailed.

C. Users

The habitat plan should have a specific section detailing who the users of the plan are expected to be. By specifying the intended users, misunderstandings can be avoided when others, also involved with the habitat, begin to use the content in the habitat plan.

D. Priority Areas

Priority areas should be identified in the habitat plan. The priority areas identified should be resources, study areas, habitat types or species of interest though not necessarily specific geographical locations. This section should have a historical habitat perspective or a functional perspective, and include how to evaluate proposed projects.

E. Actions (Plans)

Specific plans and activities for achieving the stated goals are to be included in this section. For example how many acres will be reclaimed, or what level of improvement will be sought.

F. Methodology

This section should spell out the methodology that will be used to implement the plans or actions. For example, “nursery areas will be established that will involve mapping, education, and some degree of enforcement to establish and preserve.”

G. Time Line

A time line for achieving goals may be very difficult to establish. However, expected dates for implementation and completion of the individual actions are necessary to allow measurement of successes, or to allow for course corrections. The time line should put out reasonable expectations for completion. Even if timely completion is not achieved, time spent goal setting can help to point out that an adjustment must be made.

H. Measurements/Monitoring

In a time of limited resources and funding sources, it is more important than ever to document progress towards established goals. Indeed many funding sources will require such demonstrated progress. The habitat plan should spell out how progress and the achievement of goals will be measured, and how success or completion of a task will be determined.

I. Supporting/Scientific Justification Rationale

The plan should include the justification supporting the development of the goals, and the plans used to achieve those goals. This may take the form of a specific section of the document, but may be more useful if interspersed throughout the document to justify each goal, plan of action, type of measurement, and definition of success.

J. Impacts

All actions or lack of action will have both ecological and economic impacts. This section need not become a complete risk assessment and feasibility study. Identification of impacts may both gain support for the plan and forestall criticism.

K. Alternatives

Alternatives to plans of actions or to adopting a no-action alternative should also be discussed in the light of the impacts identified in the previous section. As with impacts, discussion of these alternatives may both gain support for the plan and forestall criticism.

L. Budget Appendix (Optional Section)

There was disagreement about the efficacy of including a budget appendix as a part of the habitat plan. The long-term existence of a habitat plan coupled with the vicissitudes of funding and the economy in general would seem to weigh against including a budget section. However, at least half of the workshop participants believed that budgetary considerations could provide a significant guiding force for the habitat plan.

HOW DO WE EVALUATE RESTORATION ACTIVITIES?

Evaluation begins with clear targets that are directed at satisfying information requirements of the following three user groups:

- a. The **public and related interest groups**. Clear targets can assist with "buy in" by project neighbors or cognizant jurisdictions. Presentation of the targets can be more informal, forgiving and suitable for the media.
- b. Your **project's funding source** (granting authority).
- c. **Scientific evaluators** (those concerned with elements like ecosystem function, data quality and integrity of the information base used to evaluate the project.) These measures of success need to have more rigor than "a" above.

The workshop participants had the following suggestion regarding evaluation: Establish measurable criteria to chart success or measure progress towards it. Focus on goals that are laid out in the original plan (like acres of SAV, miles of buffer). Relating these to accomplishments in the project outcome is important. Include "flagship species", those that use the habitat (like blue crabs and SAV), which will prosper as the program moves forward, or which are outright targets (oyster density on restored beds).

- Document secondary objectives. Projects, like oyster reef creation, may involve initial settlement of the target species. Unfortunately, diseases independent of the project itself can cause die-off. Organizers should pre-plan to measure secondary functions of the structure as refugia and habitat for other organisms, so that evaluators understand the habitat created has utility for secondary purposes. Identify these early in the project.

Implement a monitoring plan: objectives of this should be clearly pre-established, and the measures chosen to insure the data will answer the questions posed.

Criteria should be set to meet the objectives.

A reference site could be useful where appropriate. What you establish should be site specific where possible.

Be mindful of the value of compatible measures of success.

The endpoint should be clearly identifiable. "Begin with the end in mind."

Budget considerations cannot be avoided, especially where protracted maturation of a restoration is likely. Be certain the resources are committed to do the full job needed.

HOW DO WE MEASURE SUCCESSFUL ATTAINMENT OF RESTORATION GOALS?

Future funding and continued progress towards habitat plan goals requires successful attainment of interim goals, and successful completion of plans and actions identified by the habitat plan. To be measurable, an established numeric goal with some allowances for variability in time, spatial extent, confidence interval, and natural variability needs to be set. Consider multiple frequencies and intervals. Cite specific contributions to watershed/ecosystem improvements. Do pluses outweigh minuses?

Re-evaluate the original goals at the end of each activity. Make sure when setting goals that all impacts are identified and tracked for re-evaluation. Include evaluation of both planned and unplanned outcomes with respect to habitat goals.

It can be useful to ask, "*How did others measure success?*" in order to be grounded in political and economic reality. Most importantly, the potential value or ability of self-sustainability should be determined for each project.

WHEN SHOULD OUR MEASUREMENTS BE MADE?

There are many variables involved in determining the measurement of success. Funding groups may well specify a time to completion for example. Some activities, such as approval of engineering drawings or hiring of contractors, can be clearly set. However, the environmental scale of the change **MUST** be taken into account when setting measurement intervals. For example, the time to attain a goal of percent coverage in a grass-dominated marsh is much shorter than the same goal in a forested wetland.

It is prudent to set interim measurement goals in order to satisfy habitat managers and funding sources that progress is being made. These interim measurements also allow for mid-course corrections.

WHAT IS THE LIFE CYCLE OF A HABITAT PLAN?

The habitat plan is a living document. It is a roadmap for the attainment of goals in the natural system. Some of the goals set at the outset of the habitat plan will be quickly met by the satisfaction of some of the actions or plans described. Other goals may take longer to achieve. Attainment of some of the goals may identify the need for further actions. However, if the habitat plan has set the goals properly, it will remain a useful roadmap for resource managers well into the future.

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