

A Report by a Panel of the

NATIONAL ACADEMY OF PUBLIC ADMINISTRATION

for the National Oceanic and Atmospheric Administration

AN EARLY EVALUATION OF NOAA'S HABITAT MATRIX PROGRAM



2009

NATIONAL ACADEMY OF
PUBLIC ADMINISTRATION®



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January 2009

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FOREWORD

Like so many other federal agencies, the National Oceanic and Atmospheric Administration (NOAA) is striving to more fully meet its performance and accountability responsibilities to the Congress and the American people. I am pleased that NOAA once again asked for the National Academy's assistance. This new assignment allowed us to build on our previous work for NOAA related to maintaining and protecting the nation's marine fisheries and marine sanctuaries. In this report, we evaluate NOAA's efforts to protect and restore coastal and marine habitats—the essential living environments upon which the nation's commercial and recreational fish populations depend.

NOAA's protection and restoration responsibilities are huge, but, its habitat programs are small. The coastal and marine habitats under NOAA's care cover thousands of miles of rivers, the shores of oceans, gulfs, and Great Lakes in 31 states, 40 major estuaries, and other great expanses of water. Yet, NOAA's protection and restoration programs—designed to guard against and recover from oil spills, toxic wastes, marine debris, aquatic invasive species, blocked access to spawning areas, and losses of vital wetlands, coral reefs and undersea grasses—are funded at just \$112 million per year. Consequently, the success of these small NOAA programs depends upon many partnerships—with other federal agencies, state and local governments, the fishing and boating, industries, and others.

NOAA faces significant challenges to perform better and demonstrate its success. To help NOAA meet these challenges, this report recommends improvements in program designs, investment priorities, and performance measures. The Panel's recommendations include: establishing an overarching statutory framework to unify diverse habitat programs around outcome oriented goals, strengthening performance goals and annual targets, increasing the scientific support for habitat assessments and progress reporting, and working more closely with the program's numerous partners and stakeholders.

I want to express the National Academy's sincere thanks to the very fine Panel and staff that worked diligently with NOAA to develop this excellent report. The Academy also appreciates the extensive professional interaction NOAA provided throughout this study, and believes the report's recommendations will provide valuable assistance to the agency.



Jennifer L. Dorn
President and Chief Executive Officer

EXECUTIVE SUMMARY

Background

This still-young program continues to be administered primarily as a collection of individual programs rather than as a unified program with clear priorities and performance targets. Within this context, the individual programs appear to be effective in producing essential program outputs. Nevertheless, the Habitat Matrix Program as a whole cannot yet demonstrate progress toward achieving the outcome goals set forth for it by NOAA's Ecosystem Goal Team—healthy habitats for living marine resources that contribute to (1) healthy and productive coastal and marine ecosystems that benefit society, and (2) a well-informed public that acts as a steward of coastal and marine ecosystems. The Academy Panel's recommendations for strengthening the Habitat's ability to demonstrate progress toward outcome goals include immediate actions to improve the program's existing logic models and performance measures—working with other federal agencies, NOAA's regional offices, and non-federal partners to relate the current programs more directly to commonly agreed-on outcomes. The Panel also recommends a long-term strategy to establish new performance measures that can more directly document progress toward reaching explicit habitat improvement goals required to achieve larger ecosystem, fish population, and socio-economic goals.

The Habitat Matrix Program in the National Oceanic and Atmospheric Administration (NOAA) was established in its present “matrix” form in fiscal year 2004. It is one of several matrix programs in NOAA designed to coordinate programs with similar goals so they can be more effective and efficient in achieving those goals. This Matrix includes the following core programs, which are administered by three separate line offices within NOAA:

- Habitat Protection
 - Essential Fish Habitat
 - Hydropower (dam licensing)
- Habitat Restoration
 - Community-based Restoration
 - Coastal Wetlands Planning, Protection and Restoration
- NOAA Chesapeake Bay Office
- Damage Assessment, Remediation and Restoration
- Marine Debris
- Aquatic Invasive Species

NOAA asked the National Academy of Public Administration to conduct an independent evaluation of the program that would meet the program evaluation requirements of the U.S. Office of Management and Budget. The Academy conducted this study from April through December 2008.

Findings

The Academy Panel for this study found that:

- The Habitat Matrix Program is a collection of six core programs, each of which is separately authorized and funded, and each of which is small compared to the legislative mandates for which it is responsible.
- The Matrix Program has no overarching purpose or authority in law, but considerable work has been done within NOAA to develop an overarching outcome-oriented goals structure for the Program. The goals focus on three main functions: (1) protect and manage habitats that are important to maintaining healthy and adequate marine populations, (2) restore coastal and marine habitats that have been damaged or degraded, and (3) promote public stewardship to assist in protecting and restoring these habitats.
- Operationally, however, this still-young program continues to be administered primarily as a collection of individual programs rather than as a unified program with clear priorities and performance targets.
- The individual core programs have some useful performance measures and can demonstrate accomplishments, but the accomplishments recorded are largely program outputs rather than outcomes. Within this context, the programs appear to be effective. This view is consistent with a large number of prior evaluations conducted by outside parties, as well as with NOAA accomplishments reports and the views of stakeholders to which the Academy had access.
- Nevertheless, the Habitat Matrix Program as a whole cannot yet demonstrate progress toward achieving the outcome goals set forth for it by NOAA's Ecosystem Goal Team.
- A strategic approach to unifying this program around its outcome goals has begun.

Recommendations

The Academy Panel makes the following recommendations to strengthen the overall Habitat Matrix Program, revise the program's investment priorities, and strengthen the program's performance measures that pertain to the outcomes of the whole matrix.

To strengthen coordination within the Matrix Program and make it more outcome-oriented, the Panel recommends that the program's leaders:

- Pursue an overarching legislative authorization and a revised program charter that would further clarify the program's mission and give it stature comparable to the programs dealing more directly with the populations of living marine resources
- Involve the Program's many stakeholders on a regular basis
- Continue to develop a more strategic approach to achieving outcome-oriented performance goals and logic models that relate program activities more closely to these goals

- Work more closely with other federal agencies and non-federal partners to coordinate resources and build joint strategies that would enhance their combined performance
- Focus more on integrating Habitat principles and recommendations into the planning for the protection and restoration of ecosystems and the management of fisheries by federal and non-federal action agencies, and then align NOAA Habitat projects to be consistent with such plans

To revise the program’s investment priorities, the Panel recommends the program’s leaders:

- Develop and spread the use of standard criteria for prioritizing the spending of funds available to the programs in the Habitat Matrix
- Make greater use of pre-consultations and stakeholder education to expand the influence of the program
- Invest more in contributing to large-scale planning efforts that have the potential to affect multiple projects
- Provide incentives to participate in large-scale planning activities that could extend the program’s benefits beyond the reach of the individual small-scale projects that currently dominate the program’s work
- Work with other NOAA leaders to increase the availability of all appropriate NOAA scientific analysis and data resources for use by Habitat programs
- Leverage NOAA’s influence on habitat issues through its participation in Interagency committees

To strengthen Habitat Program performance measures, the Panel recommends the program’s leaders:

- Select the best existing performance measures and use them in the near-term as outcome-related indicators of the program’s effectiveness.
 - Group these measures according to their contributions to the three primary goals of the Matrix Program
 - Work with other federal agencies, NOAA’s regional offices, and non-federal partners to agree on common measures and data collection protocols that could yield more comprehensive and reliable databases for use by all the partners
 - Relate these measures to targets for meaningful progress toward improving overall Habitat conditions, and driving Habitat Program actions designed to increase the rate of progress
 - Present performance measures in a “dashboard” format to improve their usefulness for management decision-making and communications

- Over a longer time, create and use a new set of performance measures to document progress toward achieving established Habitat improvement goals required to help reach related ecosystem, fish population, and socio-economic goals.

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ACRONYMS

Academy	National Academy of Public Administration
ACFCM	Atlantic Coastal Fishery Cooperative Management Act
AISP	Aquatic Invasive Species Program
ANSTF	Aquatic Nuisance Species Task Force
B-WET	NOAA Chesapeake Bay Watershed Education and Training Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRCA	Coral Reef Conservation Act of 2000
CRP	Community-based Restoration
CWA	Clean Water Act
CWPPR	Coastal Wetlands Planning, Protection and Restoration Program
CWPPRA	Coastal Wetlands Planning, Protection, and Restoration Act
CZM	Coastal Zone Management
DARRP	Damage Assessment, Remediation and Restoration Program
DPA	Deepwater Port Act of 2002
EFH	Essential Fish Habitat
EISA	Energy Independence and Security Act of 2007
EP Act	Energy Policy Act of 2005
EPA	Environmental Protection Agency
ERA	Estuary Restoration Act of 2000
FERC	Federal Energy Regulatory Commission
FIS	Fisheries Information System
FMP	Fishery Management Plan
FPA	Federal Power Act
FWCA	Fish and Wildlife Coordination Act
FWS	Fish and Wildlife Service
GASB	Governmental Accounting Standards Board
LNG	Liquefied Natural Gas
MDRPRA	Marine Debris Research, Prevention, and Reduction Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MWEE	Meaningful Watershed Educational Experience
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
NCBO	NOAA Chesapeake Bay Office
NEPA	National Environmental Policy Act
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
OMB	Office of Management and Budget
OPA	Oil Pollution Act of 1990
PART	Program Assessment Rating Tool
SAFETEA-LU	2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SAV	Submerged Aquatic Vegetation
SEA	Service Efforts and Accomplishments
SFA	Sustainable Fisheries Act of 1996
STAC	Scientific and Technical Advisory Committee

INTRODUCTION

The Habitat Matrix Program in the National Oceanic and Atmospheric Administration (NOAA) asked the National Academy of Public Administration (the Academy) to conduct an independent evaluation of the program and to answer the following three principal questions:

1. Is the Habitat Program investing in the right areas to fulfill its mandates?
2. Are the Habitat Program efforts effective in achieving Program goals and objectives?
3. How can the Habitat Program improve its effectiveness in fulfilling its goals and objectives?

This evaluation is to (1) include all the programs within the Matrix and (2) fulfill the standards of an outside independent evaluation set forth in the Office of Management and Budget (OMB) guidelines for program reviews performed using the Program Assessment Rating Tool (PART). In particular, the PART questions are:

- Are independent evaluations of sufficient scope and quality conducted on a regular basis or as needed to support program improvements and evaluate effectiveness and relevance to the problem, interest, or need?
- Do independent evaluations of sufficient scope and quality indicate that the program is effective in achieving results?

This report is designed to answer these questions. It results from an extensive effort to (1) analyze program data and accomplishments, (2) assess how the program sets priorities and implements its activities, (3) review previous evaluations of programs encompassed within the Matrix, and (4) explore how stakeholders perceive the Habitat Matrix Program.

The Academy Panel and staff responsible for this study worked closely with the NOAA Habitat Matrix Program leadership throughout the evaluation. NOAA provided (1) data for the past five years—to the extent available—on the main performance measures being used, the associated targets, and funding levels within each of the Program's three major outcome-oriented goal areas, (2) a list of prior evaluation studies performed on the programs within the Matrix, and (3) a list of stakeholders familiar with programs within the Matrix. NOAA also provided the Academy staff with several in-person briefings and videoconference interviews with regional office employees responsible for implementing two of the programs in the Matrix. In addition, the Matrix program leaders met with Academy staff several times as a group, participated in all of the Panel meetings, and worked together in a separate Academy-facilitated one-day workshop devoted to strengthening and unifying the Matrix Program, improving the Program's performance measures, quantifying the Program's long-term goals, setting ambitious annual targets, and strengthening the Program's ability to communicate its effectiveness and benefits.

NOAA’S HABITAT MATRIX PROGRAM

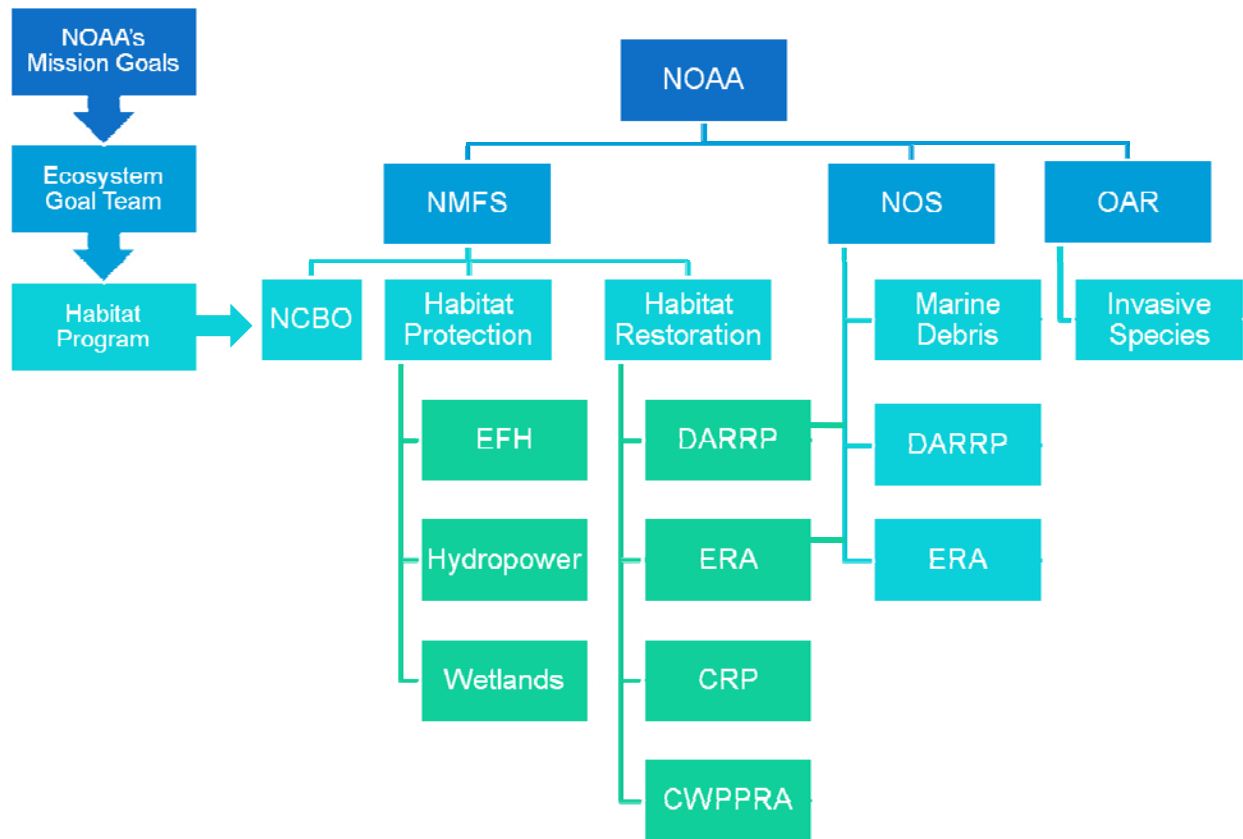
NOAA’s Habitat Matrix Program was established in its present “matrix” form in fiscal year (FY) 2004. It was established as one of several matrix programs in NOAA designed to coordinate programs with similar goals so they can be more effective and efficient in achieving those goals. This Matrix includes the following core programs, which are administered by three separate offices within NOAA:¹

- Habitat Protection
 - Essential Fish Habitat (EFH)
 - Hydropower
- Habitat Restoration
 - Community-based Restoration (CRP)
 - Coastal Wetlands Planning, Protection and Restoration (CWPPR)
- NOAA Chesapeake Bay Office
- Damage Assessment, Remediation and Restoration (DARRP)
- Marine Debris
- Aquatic Invasive Species (AISP)

These core programs and organizational relationships are shown graphically in Figure 1 on the following page.

¹ These separate offices are: National Marine Fisheries Service (NMFS), National Ocean Service (NOS), and Oceanic and Atmospheric Research (OAR).

Figure 1 : Habitat Matrix Program Core Components



Source: NOAA

There is no single broad, overarching authority for the Habitat Matrix Program. The Charter for the Habitat Matrix Program consists of 29 pages of citations to 19 primary federal laws and many other sources of authority under which the program operates. This legal framework establishes the Matrix Program’s responsibilities and identifies many of the other federal agencies and programs the Matrix Program is charged to work with. This framework is commonly referred to within the Program as its “mandates.”

The 19 primary federal laws may be summarized as follows:

- **Atlantic Coastal Fishery Cooperative Management Act (ACFCM):** The Matrix Program’s role under this Act is to assist in ensuring state compliance with mandated conservation measures in the approved fishery management plans for this region.
- **Clean Water Act (CWA):** This water pollution control act charges NOAA with certain roles in advising on ocean pollution discharges, dredging and filling in wetlands, discharge of dredged materials into navigable waters to protect aquatic resources, and to seek damages to restore natural resources injured by discharges of oil or hazardous substances.

- **Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA):** This act authorizes federal funding and requires NOAA to coordinate with other federal and state agencies to plan and implement large-scale coastal wetlands restoration projects in Louisiana.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** Authorizes NOAA to seek compensation for damages to natural resources under its trusteeship that are injured by release of hazardous materials.
- **Coral Reef Conservation Act of 2000 (CRCA):** The Habitat Matrix Program works with NOAA's Coral Reef Conservation Program to review and recommend conservation measures to federal and state agencies to avoid damage to coral reefs, provide assistance to states for removing abandoned fishing gear, marine debris, and abandoned vessels from coral reefs, and to conserve living marine resources and restore coral reef habitat.
- **Deepwater Port Act of 2002 (DPA):** Authorizes NOAA to participate in licensing deepwater ports, including those for Liquefied Natural Gas (LNG).
- **Energy Independence and Security Act of 2007 (EISA):** Authorizes NOAA to work with the Department of Energy to help minimize environmental impacts of marine and hydrokinetic renewable energy technologies.
- **Energy Policy Act of 2005 (EP Act):** Modified procedures for NOAA review of hydropower licensing projects.
- **Estuary Restoration Act of 2000 (ERA):** Established an Interagency Council, including NOAA, to promote restoration of estuary habitats. Authorizes money to NOAA and other agencies to support the effort.
- **Federal Power Act (FPA):** Provides a strong role to NOAA to advise the Federal Energy Regulatory Commission (FERC) on issuing licenses for hydropower projects on navigable waters and federal lands, and to prescribe some conditions for issuing licenses.
- **Fish and Wildlife Coordination Act (FWCA):** Provides for NOAA (and others) to consult with all federal agencies proposing actions that may result in modifying natural streams and natural bodies of water for the purpose of reducing environmental impacts to anadromous, estuarine, and marine fisheries and their habitats.
- **Magnuson-Stevens Fishery Conservation and Management Act (MSA) and Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006:** Authorizes NOAA to work with regional Fishery Management Councils to help develop fishery management plans (FMPs) that identify and describe essential fish habitats (EFH) and specify protection actions needed to avoid adverse fishing impacts on those habitats. When NOAA finds that a proposed federal or state action would adversely impact EFH, it is required to provide conservation recommendations. The Act also authorizes the Community-based Restoration Program to implement and support the restoration of fishery and coastal habitats by providing Federal financial and technical assistance to encourage locally led coastal and marine habitat restoration, and to promote stewardship and conservation values for NOAA trust resources.

- **Marine Debris Research, Prevention, and Reduction Act (MDRPRA):** Mandates NOAA to establish a Marine Debris program, and also re-structured the Interagency Marine Debris Coordinating Committee. Made NOAA the lead for most portions of the Act and specifies certain features of the program.
- **National Environmental Policy Act (NEPA):** NOAA prepares NEPA documents on its own activities and comments on proposed actions by other federal agencies that might impact NOAA trust resources.
- **National Marine Sanctuaries Act (NMSA):** NOAA administers trustee responsibilities for these areas.
- **NOAA Authorization Act of 1992 and Re-Authorization Act of 2002:** Created the NOAA Chesapeake Bay Office (NCBO) and authorized it to, among other things, “develop and implement a strategy for the National Oceanic and Atmospheric Administration that integrates its science, research, monitoring, data collection, regulatory, and management responsibilities ... in such a manner as to assist the cooperative, intergovernmental Chesapeake Bay Program to meet the commitments of the Chesapeake Bay Agreement.”
- **Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (NANPCA):** Establishes the Aquatic Nuisance Species Task Force (ANSTF), co-chaired by NOAA. Directs the ANSTF to develop and implement efforts to prevent, monitor, control, and disseminate related information. Also charges the departments of Commerce and the Interior to conduct a ballast water management demonstration program to demonstrate prevention technologies and practices aboard ships.
- **Oil Pollution Act of 1990 (OPA):** NOAA has delegated authority under this act to recover damages from parties responsible for discharging oil into navigable waters and adjoining shorelines.
- **2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU):** Several provisions of this act affect NOAA. Among them is one that makes materials resulting from the demolition of certain types of bridges available for ecosystem restoration and marine habitat creation.

Four of the Habitat Matrix Program’s six main component programs existed long before the formation of the Matrix Program. However, NOAA formed the Aquatic Invasive Species Program (AISP) only one year before the Matrix Program. Congressional earmarks started the Marine Debris Program in 2005, but it was not included in the President’s Budget request until FY 2009.

Several programs in the Matrix receive earmarked funding, but most use base funds to meet the majority of their needs. However, the NOAA Chesapeake Bay Office (NCBO) relies on earmarks to help support base activities as well. The contributions of earmarks to the programs in the Matrix over the last five years are shown in the Table 1 on page 14. In that table, the term “earmarks” is used to refer to any money added to the President’s budget by Congress.

The effects of Congressional earmarks on the Matrix Program vary as described below. Some mandate specific projects, and associated funds pass through the Matrix Program without any ability of NOAA to influence their use. Others provide discretion that allows them to be integrated into the Program's priorities. And some are simply augmentations of the NOAA budget. However, these funds are not planned and budgeted for, so it is difficult to integrate them into the accomplishment of long-term goals.

Nevertheless, if earmarks decline significantly and are not replaced by regularly budgeted funds, this could present the Matrix Program with a significant financial squeeze. Earmarks currently make up approximately 17.5 percent of the total Matrix Program budget.

The Habitat Matrix Program was created to integrate and leverage the activities of the core programs to more effectively meet the overarching goal of improving the health and productivity of the nation's coastal, marine, and Great Lakes ecosystems by achieving the following three basic sub-goals:

1. Habitat Protection and Management
2. Habitat Restoration
3. Habitat Stewardship

The six programs within the Matrix each contribute to achieving more than one of these three goals. And many of the Matrix Program's performance measures are contributed to by more than one program. The program's three basic goals contribute to the following two larger NOAA ecosystem goals:

- Healthy and productive coastal and marine ecosystems that benefit society
- A well-informed public that acts as a steward of coastal and marine ecosystems

To place the Habitat Matrix Program in a broader context, the Academy Panel constructed an overall logic model showing how the six Matrix Programs and their subsidiary programs contribute to similar program outputs that funnel into broader NOAA core goals for achieving NOAA-defined outcomes:

- Coastal and Marine Habitat and Ecosystem Conditions
- Living Marine Resource Conditions
- Habitat Services

The overall logic model for the Matrix Program shows:

- the challenges faced by programs within the Habitat Matrix
- the tools (authority and activities) that each program uses to get results
- the outputs associated with the program activities

- how other NOAA programs outside the Habitat Matrix contribute to the same program outputs
- how each program depends on scientific habitat assessments from inside and outside NOAA to support its work
- how each program depends on NOAA and other stewardship programs to provide volunteer hours and other support actions by members of the public and officials at other levels of government
- how the programs within the Habitat Matrix depend upon other programs in NOAA as well as other federal agencies and partners to take actions to protect and restore habitats of importance to achieving NOAA goals

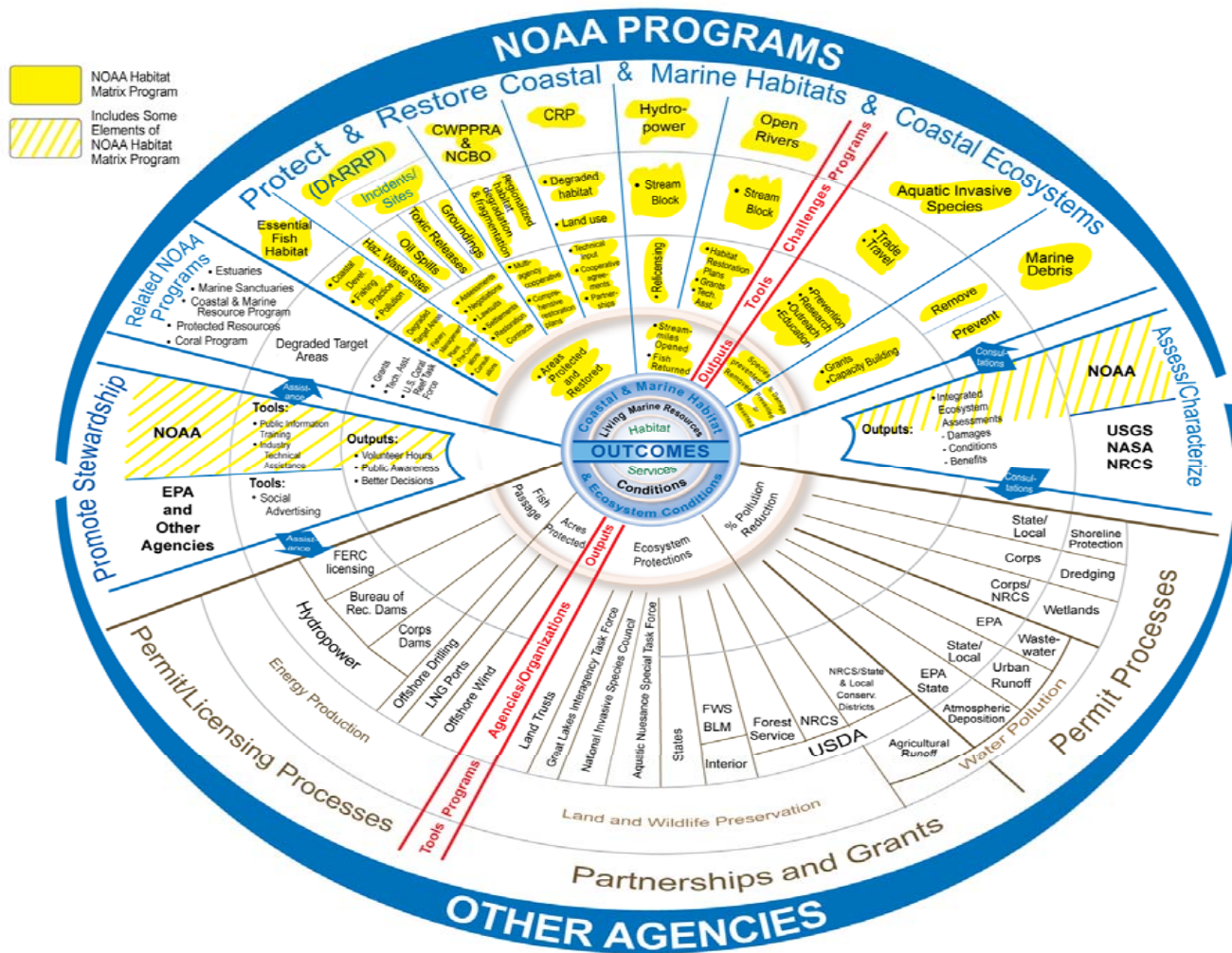
The overall logic model for the “Habitat Matrix Program in Context” appears on page 9. It was constructed, in part, from a close reading of the Habitat Matrix Charter.

An examination of all the programs in the Habitat Matrix Charter found the following major operating “tools” being used to accomplish the purposes of the component programs. They have been grouped into three broad categories: (1) knowledge creation and sharing—including science, (2) influencing the activities of action agencies outside the Matrix, and (3) direct actions by the Matrix Program. Here is the list:

1. Knowledge creation and sharing
 - a. Assessments (potentially measured as a percent of needed or requested assessments completed, and how current they are)
 - i. Damage assessments
 - ii. Condition assessments
 - iii. Assessments of benefits and value added
 - b. Sharing knowledge to support operations within NOAA (especially in developing program guidance, empowering partnerships, identifying research needs, and developing curriculums for stewardship training, education, and public information)
2. Influencing action agencies (through assessments, reviews, and consultations), such as:
 - a. Hydropower licensing consultations—FERC
 - b. Designations and protection for essential fish habitats—Fishery Management Councils, Interstate Fish Commissions
 - c. Wetlands permitting—Corps of Engineers,
 - d. Water pollution permits—Environmental Protection Agency (EPA)/states
 - e. Listings of Superfund sites (and clean-up plans)—EPA
 - f. Invasive species prevention regulations—Coast Guard, Federal Maritime Administration

- g. Dredging permits—Corps of Engineers
 - h. Chesapeake Bay Program—EPA and its many partners (primarily for pollution reduction and fisheries restoration)
 - i. Fishery Management Plans—Fishery Management Councils, Interstate Fish Commissions, commercial and recreational fishing industries
 - j. Co-chairing and participating in several federal interagency committees
 - i. National Invasive Species Council—NOAA co-chairs it
 - ii. Great Lakes Interagency Task Force
 - iii. Aquatic Nuisance Species Task Force—NOAA co-chairs it with U.S. Fish and Wildlife Service
 - iv. Interagency Marine Debris Coordinating Committee—NOAA co-chairs with EPA
 - v. U.S. Coral Reef Task Force—NOAA co-chairs with Secretary of the Interior
 - k. National Fish Habitat Action Plan
3. NOAA Direct Actions
- a. Recover payments for marine damage
 - b. Restore damaged habitat areas
 - c. Stewardship education and training
 - d. Issue technical guidance and provide technical assistance
 - e. Remove marine debris; prevent marine debris; research marine debris issues
 - f. Support community participation
 - g. Competitive grants and cooperative agreements to help support habitat partnerships
 - h. Contracts for federal restoration work

Figure 2 : NOAA HABITAT MATRIX PROGRAM—IN CONTEXT



The three goal-oriented logic models prepared by the Matrix Program leaders during this evaluation further detail how the programs in the Matrix work together toward each goal. The Habitat Protection and Management logic model is shown in Figure 3 on page 11 describes how this cluster of program activities within the Matrix work together to avoid negative impacts on habitats for which NOAA has a trust responsibility under federal laws.

The potential negative impacts that might occur are listed down the left side of the chart under the heading “Condition.” These conditions might be thought of as the forces working against the Matrix Program’s goals. Often, strategists call these the “threats’ or challenges that need to be overcome by the program.

The “Mandates” list in the chart cites the federal laws that empower the Matrix Program to take actions to help counter the challenges. Then, moving across the page from left to right, the chart shows a variety of activities taken by the Matrix Program with various program partners to produce relevant program outputs that are expected to translate into the desired program outcomes in the short, medium, and long term. Below the outcomes is a list of external factors that may work against achieving the desired outcomes. And under the program activities list is a description of the “Assumptions” made in specifying the program’s activities. These assumptions constitute the cause-and-effect theory or strategy used in designing the program. Spanning the entire chart across the bottom is an evaluation/assessment effort through which the program might reassess how the program is working. This effort should occur from-time-to-time (perhaps annually in sequence with the annual planning and budgeting cycle). It can lead to program adjustments designed to improve effectiveness, recognize increased or decreased program resources expected in the future, and provide current budget justifications.

Figures 4 and 5 depict the logic models for the other two basic goals: Habitat Restoration, and Habitat Stewardship. Each model follows the same format. These three detailed models represent an important step forward in formulating the Habitat Matrix Program into a more unified program.

Table 1, which follows the logic models, contains a compilation of the base funding appropriated to NOAA for the programs contributing to each goal, plus related earmarked funding from Congress, and funds obtained from non-NOAA sources. This table takes an initial step toward developing the budget-and-performance link required by OMB consistent with the Government Performance and Results Act. Showing this link is considered a “best practice” by the performance management community.

The program’s performance measures and annual progress targets are evaluated later in this report.

Figure 3 : Protection and Management Logic Model

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Protection and Management - Increased protection and conservation of habitats that support NOAA trust resources and support ecosystem health and production

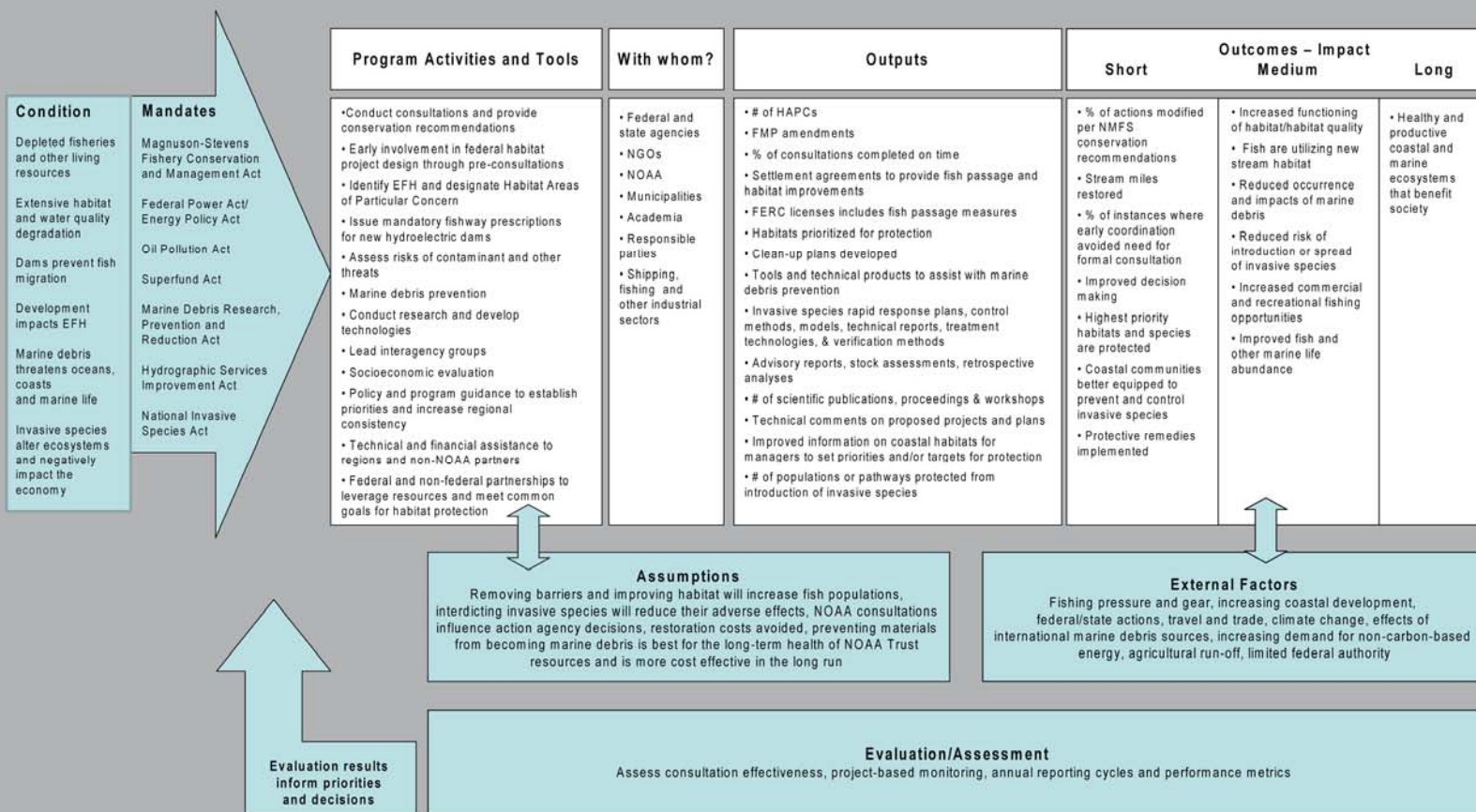


Figure 4 : Restoration Logic Model

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Restoration - Increased restoration of habitats that support NOAA trust resources to enhance the recovery of ecosystem health and production

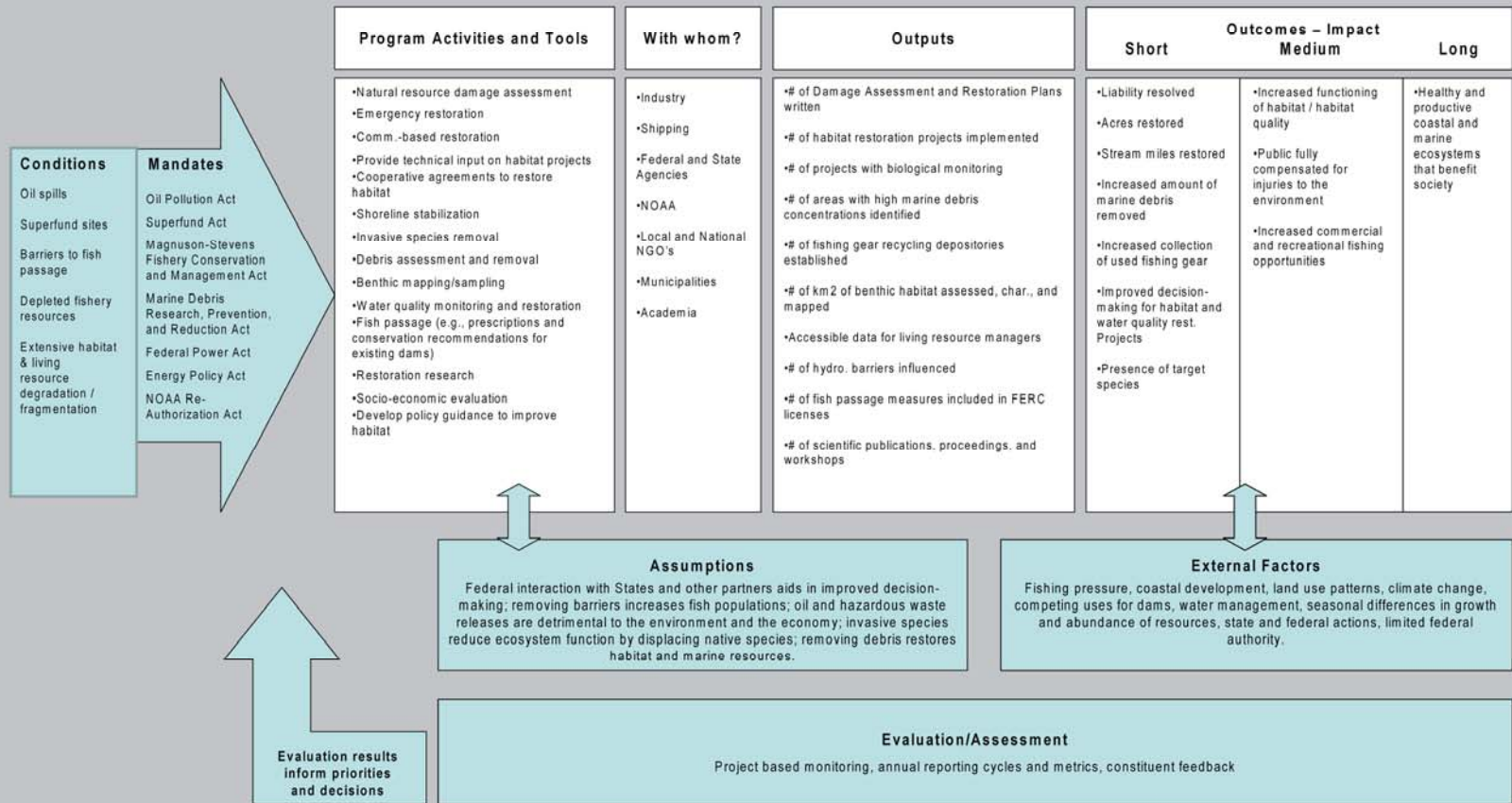


Figure 5 : Stewardship Logic Model

10/09/08

Stewardship - Increased public awareness and stewardship of habitats that support NOAA trust resources through the involvement of stakeholders and enhancement of partnerships

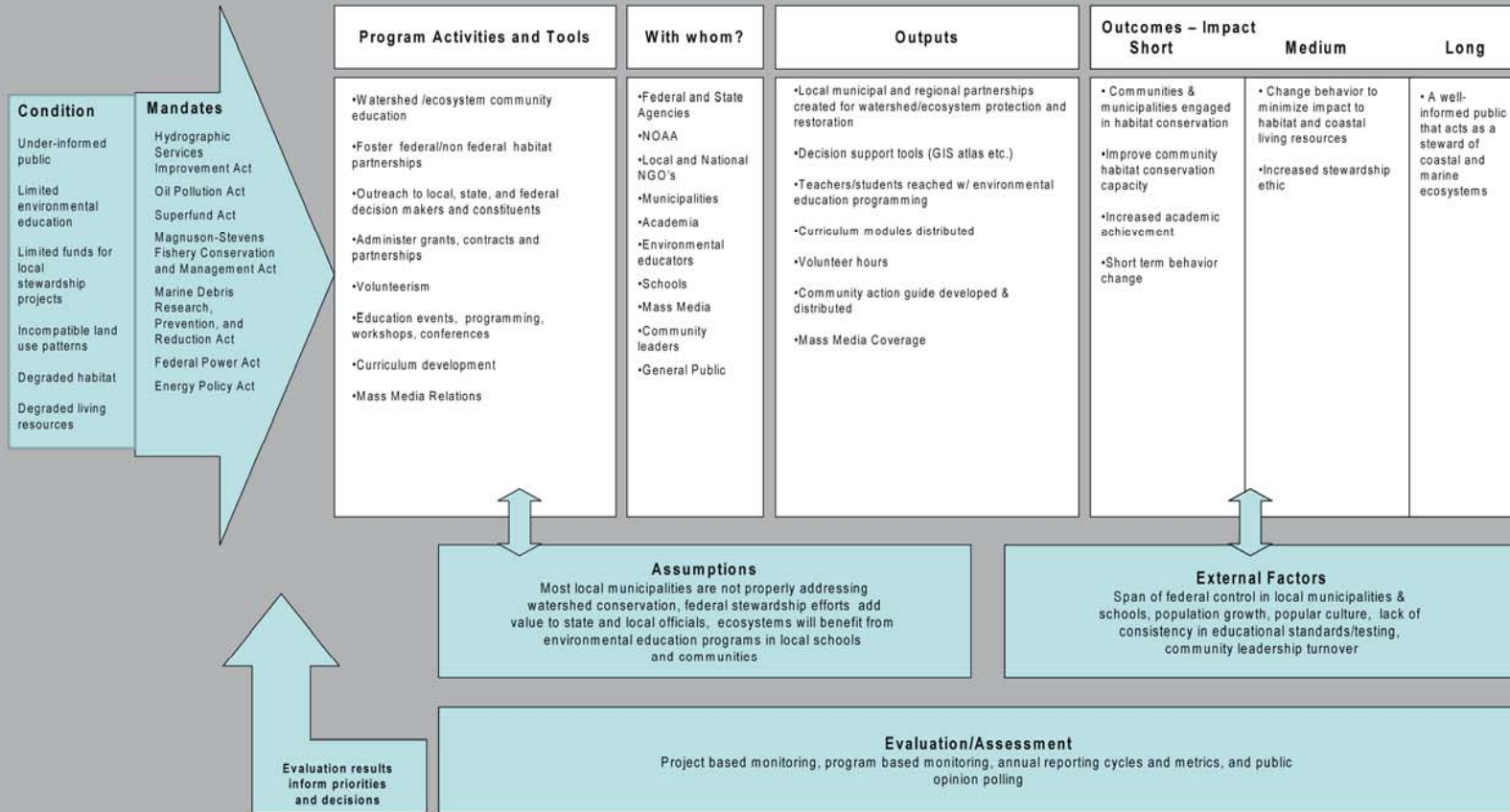


Table 1: NOAA Habitat Matrix Program Funding by Capability

NOAA Habitat Matrix Program Funding By Capability (\$K)								
Capability	Type	Program	FY 2004	FY 2005	FY 2006	FY 2007 ^{*2}	FY 2008	
Habitat Protection and Management	Base	EFH, Hydro	\$ 13,430	\$ 15,148	\$ 15,997	\$ 15,931	\$ 17,512	
		Aq Inv species	\$ -	\$ -	\$ 1,153	\$ 2,649	\$ 4,757	
		NCBO	\$ 1,573	\$ 1,643	\$ 1,644	\$ 1,655	\$ 991	
		DARRP	\$ 612	\$ 498	\$ 206	\$ 372	\$ 825	
		base subtotal	\$ 15,615	\$ 17,289	\$ 19,000	\$ 20,607	\$ 24,086	
	Earmarks ^{*3}	Aq Inv species	\$ 5,547	\$ 5,542	\$ 5,524	\$ 715	\$ 682	
		Marine Debris ^{*4}	\$ 84	\$ 2,904	\$ 2,209	\$ 2,209	\$ 1,992	
		Other protection related	\$ -	\$ 493	\$ 468	\$ -	\$ 1,498	
		earmark subtotal	\$ 5,631	\$ 8,939	\$ 8,201	\$ 2,924	\$ 4,172	
	Non-NOAA source	DARRP from EPA	\$ 2,430	\$ 2,425	\$ 2,184	\$ 1,963	\$ 1,046	
		Non-NOAA subtotal	\$ 2,430	\$ 2,425	\$ 2,184	\$ 1,963	\$ 1,046	
			TOTAL	\$ 23,676	\$ 28,653	\$ 29,385	\$ 25,494	\$ 29,304
	Habitat Restoration	Base	CRP, ORI	\$ 9,873	\$ 13,771	\$ 10,821	\$ 16,907	\$ 23,354
			DARRP	\$ 11,125	\$ 10,768	\$ 9,171	\$ 9,005	\$ 7,612
NCBO			\$ 1,095	\$ 1,150	\$ 1,151	\$ 1,162	\$ 639	
Hydro			\$ -	\$ -	\$ 159	\$ -	\$ 2,068	
base subtotal			\$ 22,093	\$ 25,688	\$ 21,302	\$ 27,074	\$ 33,673	
Earmarks ^{*3}		Other restoration related	\$ 9,097	\$ 8,823	\$ 11,430	\$ 5,736	\$ 5,099	
		Marine Debris ^{*4}	\$ 668	\$ 2,904	\$ 2,208	\$ 2,208	\$ 1,992	
		NCBO	\$ 3,822	\$ 3,942	\$ 5,917	\$ 3,870	\$ 1,784	
		earmark subtotal	\$ 13,587	\$ 15,669	\$ 19,555	\$ 11,814	\$ 8,875	
Non-NOAA source		CWPPRA	\$ 86,240	\$ 3,449	\$ 22,292	\$ 11,082	\$ 18,386	
		DARRP (recovered funds ^{*1} from responsible parties)	\$ 7,746	\$ 5,414	\$ 5,228	\$ 18,062	\$ 13,572	
		Non-NOAA subtotal	\$ 93,986	\$ 8,863	\$ 27,520	\$ 29,144	\$ 31,958	
		TOTAL	\$ 129,666	\$ 50,220	\$ 68,377	\$ 68,032	\$ 74,506	
Habitat Stewardship		Base	CRP, ORI	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
	NCBO		\$ 1,095	\$ 1,150	\$ 1,151	\$ 1,162	\$ 639	
	DARRP		\$ 275	\$ 275	\$ 275	\$ 275	\$ -	
	base subtotal		\$ 2,370	\$ 2,425	\$ 2,426	\$ 2,437	\$ 1,639	
	Earmarks ^{*3}	Aquatic Resources	\$ 9,863	\$ 9,855	\$ 8,876	\$ -	\$ 1,597	
		NCBO (includes BWET)	\$ 2,500	\$ 2,500	\$ 4,683	\$ 3,101	\$ 4,392	
		Marine Debris ^{*4}	\$ -	\$ 500	\$ 500	\$ 500	\$ 500	
		earmark subtotal	\$ 12,363	\$ 12,855	\$ 14,059	\$ 3,601	\$ 6,489	
			TOTAL	\$ 14,733	\$ 15,280	\$ 16,485	\$ 6,038	\$ 8,128
			All TOTAL	\$ 168,076	\$ 94,153	\$ 114,246	\$ 99,564	\$ 111,938

^{*1} This funding source is a NOAA managed revolving fund and is not appropriated dollars. This fund is used for assessment of damages to NOAA trust resources resulting from discharges of oil or hazardous materials, and for the restoration of the injured natural resources. Please note that these funds are recovered through settlements or awarded by a court for restoration of injured natural resources and as such, are specified to be spent on a particular case as awarded by the court.

^{*2} There were no official earmarks in FY2007--instead a pool of funding was competitively awarded by NOAA through Broad Area Announcements (BAA). Several traditional earmarks received funding in FY2007 and others did not.

^{*3} Some earmark funding is used to support base activities, especially for Marine Debris, Aquatic Invasive Species, and NCBO; however, other earmarks are mostly pass-throughs and do not contribute to program performance.

^{*4} The marine debris line is a roll up of multiple earmarks, one of which supports national marine debris activities and the others are directive earmarks.

It is important to note the small size of the Habitat Matrix Program in relationship to the very large responsibilities given to NOAA by all the federal laws cited in the program's charter and on the three goal-oriented logic models. Even though NOAA's Habitat Matrix Program operates in the context of many other federal programs that have complementary goals and resources, and in tandem with state, local, and non-governmental partners, the Program's own resources are stretched very thin for many essential activities. It often finds itself having to triage the many projects for which it has a responsibility to engage. In other words, the program cannot do everything it has responsibility for, and must decide constantly – usually on a case-by-case basis – which projects it will and will not undertake.

Altogether, the Habitat Matrix Program receives about 6 percent of the NOAA's Ecosystem funds. According to the funding table on page 14, which was compiled by NOAA for this study, the total nationwide FY 2008 funding of the Habitat Matrix Program was approximately \$112 million, which includes base funds (\$59.5 million), earmarks (\$19.5 million) and non-NOAA funds (\$33 million). For a very rough comparison, the federal share of habitat-related funding for the Chesapeake Bay Program in FY 2007 (as compiled in the Chesapeake Bay Action Plan) was approximately \$61.2 million. That program deals with only one of some 40 estuaries that NOAA works with, and estuary habitats are only one of many types of habitats for which NOAA has responsibility. Even the Chesapeake Bay program, as well as it is funded relative to other estuary programs, has been estimated to be so underfunded that it cannot come close to meeting its performance goals. The October 2004 report of the Chesapeake Bay Watershed Blue Ribbon Finance Panel, chaired by former Virginia Governor Gerald L. Baliles,² found the underfunding to be so serious that it recommended establishing a new Chesapeake Bay Financing Authority to tap new revenue sources at all levels of government to raise \$15 billion over 20 years.

THE PANEL'S FRAMEWORK FOR EVALUATING THE MATRIX PROGRAM

In developing a framework for evaluating the Habitat Matrix Program, the Academy Panel examined three primary sources of information:

- (1) OMB's instructions for using the PART
- (2) the current guidelines for developing Service Efforts and Accomplishments Reports, which are being continually refined by the Governmental Accounting Standards Board (GASB) for use by state and local governments—many of whom are NOAA partners
- (3) the Chesapeake Action Plan submitted to Congress at its request by EPA's Chesapeake Bay Program Office

The Panel examined extensive materials from each source. A brief summary of each follows.

OMB's PART Guidance

When a federal program is evaluated by OMB under the PART guidelines, it is rated on four characteristics:

² *Saving a National Treasure: Financing the Cleanup of the Chesapeake Bay* (EPA Chesapeake Bay Program Office: Annapolis, MD), p. 24.

- Clarity of the program’s purpose and goals—20% of the total score
- Effectiveness of the program’s design for achieving success—10%
- Ability to measure and demonstrate progress and results toward long-term goals—50%
- Efficiency and accountability in managing the program—20%

There is a long series of questions to answer under each of these rating categories, several of which were included in the contract for the Academy to use in performing this evaluation. Those questions helped to guide the Panel’s work. They are:

- 1.1: Is the program purpose clear?
- 1.5: Is the program design effectively targeted so that resources will address the program’s purpose directly and will reach intended beneficiaries?
- 2.1: Does the program have a limited number of specific long-term performance measures that focus on outcomes and meaningfully reflect the purpose of the program?
- 2.2: Does the program have ambitious targets and timeframes for its long-term performance measures?
- 2.3: Does the program have a limited number of specific annual performance measures that can demonstrate progress toward achieving the program’s long-term goals?
- 2.4: Does the program have baselines and ambitious targets for its annual measures?
- 4.1: Has the program demonstrated adequate progress in achieving its long-term performance goals?
- 4.2: Does the program (including program partners) achieve its annual performance goals?

Under the current PART program, the Habitat Matrix Program will be rated by OMB as a single program. If the Matrix Program can develop simple, clear measures of its success or effectiveness that can indicate to a non-expert that the program is making reasonable progress toward reaching its primary long-term goals, it will be easier to demonstrate its results. The Habitat Matrix Program is working toward this, as will be discussed later in this report.

However, for the Panel’s initial evaluation of the Habitat Matrix Program—presented in the next main section of this report—no such measures were available, so the existing measures were used. The Panel’s initial evaluation answers all the PART questions that NOAA placed in the contract for this study—using currently available information.

GASB Guidelines for Service Efforts and Accomplishments Reporting

The Service Efforts and Accomplishments (SEA) guidelines have been worked on and refined over the past 20 years in an effort to make them practical and feasible to use by a wide variety of large and small governmental units. They lay out four essential types of content that should be

included to make performance reports easily understood, and the six essential qualities that this content needs to have in order to be useful. Without belaboring them, they are:

Essential contents of a successful SEA report:

- Purpose and scope of the program being reported on
- Major goals and objectives of the program
- Key measures of performance
- Discussion and analysis of results and challenges

Essential qualities of the content:

- Relevance
- Understandability to non-technical readers
- Comparability in relationship to established targets, industry standards, and measures used by others in the same “business”
- Timeliness for use in management decision-making
- Consistency across time
- Reliability and verifiability

The SEA guidelines provide detailed explanations of these essential contents and information qualities.

The Chesapeake Action Plan

The Chesapeake Bay clean-up program, under the leadership of EPA, has been operating with a very high degree of scientific and political support for well over 20 years. NOAA has a recently established Chesapeake Bay Office (NCBO) of its own that is co-located with and working in tandem with EPA’s office—and it is part of NOAA’s Habitat Matrix Program.

A great deal of progress has been made by NCBO and many other clean-up programs in many respects. Nevertheless, the Bay continues to have an unacceptable level of pollution and seriously degraded fisheries. Despite progress in cleaning up domestic wastewater and some other sources of pollution, the quality of the Bay’s waters and its marine/coastal fish habitats is overwhelmed by pollution from urban and agricultural runoff. Many of the Bay’s problems are also problems for NOAA.

GAO evaluated EPA’s Chesapeake Bay Program in 2005, and found that its performance reporting—to Congress, the public, and many other parties (on some of the very same things for which NOAA is responsible)—was misleading and unrealistic. The program’s targets were found to be unrealistic and consistently missed, and its reporting was difficult to understand. GAO made many recommendations to EPA for improved target-setting and reporting, and

Congress directed EPA's Chesapeake Bay Program Office to implement all of GAO's recommendations and report back to Congress. These issues are very relevant to NOAA's own management, reporting, budgeting, and communications responsibilities.

The July 2008 Chesapeake Action Plan was EPA's response to Congress. From a performance reporting and communications viewpoint, it provided a more realistic target-setting process and used "dashboards" that combined reporting on performance measures with budget and other explanatory information. This approach made the measures more understandable and more useful for decision-making. The Academy Panel received a presentation on these new techniques and viewed several examples of dashboards relevant to marine and coastal habitats. One of these EPA dashboards – addressing Submerged Aquatic Vegetation (SAV) – is shown in Figure 6. It represents a current state-of-the-art performance measurement practice that NOAA may find beneficial to use in its Habitat Matrix Program.

In an August 28, 2008 letter report to Senator Barbara A. Mikulski (Maryland) on the Chesapeake Action Plan and related matters, GAO noted EPA's development of dashboards as a positive step in the right direction (GAO-08-1131R, p.12).

The use of dashboards by police departments (to target criminal activities on a real-time basis), and by mayors and governors (to hold their departments accountable for meeting performance targets on a regular basis throughout the year, instead of waiting until the end of the year when it is too late to make mid-course corrections needed to stay on target) has been growing for two decades. The performance management movement in states and local governments began even earlier than in the federal government, led by such pioneers as Oregon Benchmarks and Sunnyvale, California.³ Since then, the number of governments using outcome-oriented performance measures has increased many-fold. "CitiStat" and "StateStat" recently have become the popular terms for the new process that increasing numbers of mayors and governors are using to get accountability for results from many of the programs for which they are responsible.⁴

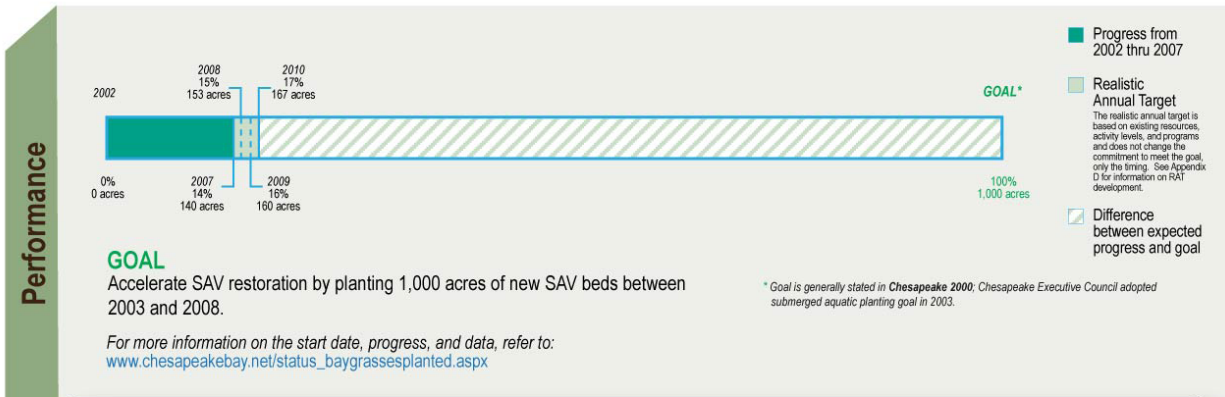
³ U.S. Advisory Commission on Intergovernmental Relations, *Intergovernmental Accountability: The Potential for Outcome-Oriented Performance Management to Improve Intergovernmental Delivery of Public Works Programs*, Report SR-21. Washington, DC: May 1996.

⁴ An easily accessible, journalistically written set of current examples is available: Jonathan Walters, *Measuring Up 2.0: Governing's New Improved Guide to Performance Measurement for Geniuses (and Other Public Managers)*. Washington, DC: Governing Books, 2007.

Figure 6 : Example of Dashboard from Chesapeake Bay Action Plan

Submerged Aquatic Vegetation Planting

CAP version 1.0
Produced on May 19, 2008



Strategic Analysis

Background
CBP partners have set a goal to plant 1,000 acres of Submerged Aquatic Vegetation (SAV). As of 2007, 14% of the goal has been achieved with 139.5 acres planted. Partners have committed to planting 27 acres of SAV between 2008 and 2010 (FY2008 – 13 acres; FY2009 – 7 acres; FY2010 – 7 acres).

Based on photographic evidence of the historic abundance of SAV in the Bay, CBP has established an SAV recovery goal of 185,000 acres by 2010. By 1984, SAV had shrunk to a low of about 38,000 acres, and by 2007 there were still only 64,911 acres of Bay grasses Bay-wide.

Strategy
To increase SAV abundance:

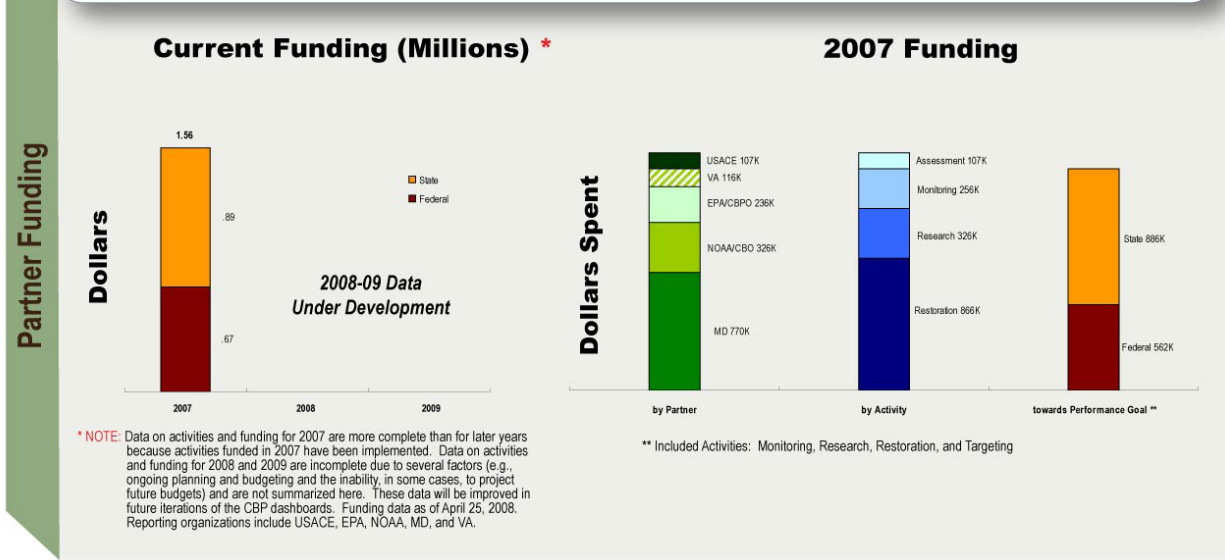
- Protect and restore water quality.
- Protect existing SAV beds.
- Accelerate restoration of SAV through planting and transplanting of SAV beds.
- Improve coordination of protection and restoration activities.

Challenges

- SAV has not demonstrated significant recovery toward the 185,000-acre goal. Achieving this goal relies overwhelmingly on the natural expansion of beds that is highly dependent on adequate water quality.
- Planting has, as expected, contributed little to SAV recovery, but has demonstrated that new techniques can accelerate its recovery in areas where water quality is suitable.

Action Needed

- Continue water quality improvement programs Bay-wide.
- Research and improve site selection criteria.
- Research and develop new SAV propagation techniques.



The Panel's Evaluation Framework

Based on a review of the materials summarized above, the Panel structured its initial evaluation of the Habitat Matrix Program to address:

- Clarity of the Program's purpose
- Effectiveness of the Program's strategic design for accomplishing the purposes and goals of the Program and the mandates under which it operates
- Clarity and ability of the Program's performance measures to demonstrate progress toward achieving long-term goals
- Value of the information from prior evaluations and accomplishments reports related to the Program's component programs
- Stakeholder views of the Program

The following section of this report addresses each of these five topics.

INITIAL EVALUATION OF THE HABITAT MATRIX PROGRAM

This initial evaluation follows the framework developed by the Panel and the related questions specified by NOAA in the Academy's contract scope of work.

Clarity of Purpose

The purpose of the Habitat Matrix Program is primarily to create and maintain healthy habitats that can adequately support the living marine resources (including fish) for which NOAA has trustee responsibilities. Secondarily, the program is expected to help create a well-informed public that acts as a steward of Coastal and Marine ecosystems. However, the Program has no overarching mandate or authority for these broad goals. Instead, the program is a reflection of weaving together the mandates and purposes of several core programs. The purposes of those core programs are individually clear and planning has been done to think about how the Matrix program can facilitate coordination between programs. Nevertheless, the still young Habitat Matrix Program has not yet integrated its separate parts or begun setting priorities across program areas.

The integration process has begun. As part of this Academy study, the Habitat Matrix Program leaders have developed an overarching logic model for the entire program and three goal-oriented logic models that show how the individual core programs can work together to contribute to the three broader Habitat Matrix goals: (1) protect and manage habitats, (2) restore habitats, (3) promote habitat stewardship. In addition, considerable strategic planning has been done within NOAA to conceptualize the process of maintaining and improving healthy habitats essential to maintaining and improving robust and sustainable fisheries, protected resources, and

other living marine resources. This accepted goal-oriented strategy is shown graphically in Figure 7 on page 22.

Effective Program Design

The operational design of the Habitat Matrix Program when the Academy study began was based primarily on the numerous individual legislative mandates under which it operates. The Matrix itself was not yet developed as a unified program for focusing its diverse programs on common long-term strategic goals and measures for improving overall habitat conditions. Thus, it was not and is not strategically targeted at this time. One obstacle to doing this is the lack of an overarching legislative mandate or authority. Also, funding for the Matrix Program is appropriated according to the individual components and their legislative mandates, which limits the Program's flexibility to direct resources strategically.

Similarly, the current performance measures are designed to assess performance related to fulfilling individual legislative mandates. Undoubtedly, the individual activities undertaken are effective for those purposes in most cases. And, the three new goal-oriented logic models (shown on pages 11-13) provide a potential basis for reassessing the existing program design to orient it more toward broader, more unified long-term habitat improvement goals.

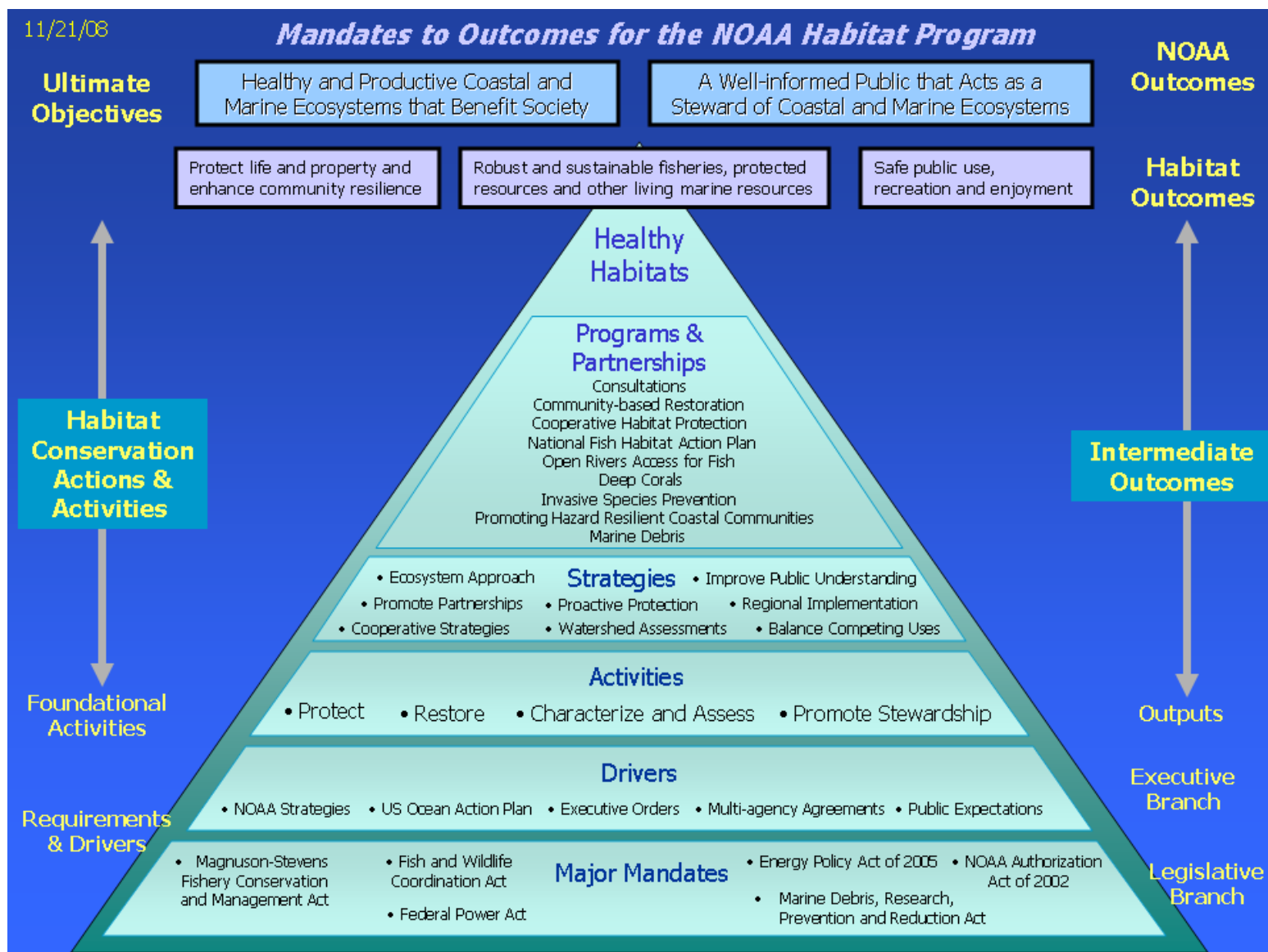
Priorities Within and Across Core Programs

While it is clear that careful thought goes into how to ensure that the program's resources are well spent, there is not a clear sense of an overarching prioritization or framework in which allocation decisions are made. From a program management perspective, the predominant approach is to set workload targets scaled to budget limits and expected case-loads in each program—such as numbers of hydropower re-licensing applications, and numbers of proposed developments having the potential to disturb important coastal and marine habitats—and then to triage the case-loads to keep them within a manageable range. No standard protocols for making the triage decisions appear to be in use for NMFS' regional EFH offices where projects are implemented, although many triage decisions clearly are being made at the regional level. Data being used to set annual performance targets are mostly past levels of activity, rather than data showing progress toward filling recognized gaps between existing habitat conditions and desired habitat conditions. Several of the programs in the Matrix have annual workload planning processes and protocols for adding new projects. The DARRP and AISP programs are two examples of project prioritization protocols. They are compared with MDP, CRP and Hydropower criteria in the Table 2 on page 27.

Within the Matrix Program, we did not find planning that was directed toward defining the overall size of habitat threats and vulnerabilities. We also did not find quantified or operationalized goals for meeting such needs built into long-range management plans and annual targets against which to measure progress. However, it may be argued that it is not reasonable to expect this in such a small program.

The Hydropower program is the easiest component of the Matrix to plan for, because most of its work involves reissuing licenses for dams that have been licensed before for specific time

Figure 7 : Conceptual Model of Goal-Oriented Strategy



periods and the time for re-licensing is known far ahead. Most of the other “cases” that NOAA pursues in the Habitat Matrix core programs occur in an episodic, unplanned manner. The triage process, therefore, is a matter of taking the “best” opportunities at any given time to make a positive difference for the “health” of the “most important” habitats that attract attention. Program people in the regions or on the ground have discretion to make these decisions using their own best judgment, or the competitive grants process. Based on Academy staff interviews with NMFS regional office Habitat personnel, some regions make greater use of prioritization than others.

A potential alternative to the currently dominant case-management approach is illustrated by the April 2006 Pacific Salmon Recovery Plan (see Appendix B, page 55 for an evaluation of the Pacific Salmon Recovery Fund). This plan, which was prepared by NOAA’s Protected Species Program (outside the Habitat Matrix Program) begins to provide comprehensive assessments of current conditions in eight geographic Pacific Salmon coastal recovery domains, and specifies habitat maintenance and improvements needed to bring salmon populations back to acceptable levels along the entire Pacific Coast of the U.S. This strategic state-by-state and watershed-by-watershed planning identifies habitat projects that need to be accomplished to help the recovery effort in distinct management areas. It illustrates how such plans could provide a framework for the Habitat Matrix Program to help implement ecosystem restoration strategies by advising on Habitat-related cases that may come up within the Matrix suite of programs. In this instance, a list and schedule of proposed actions is laid out to provide benchmarks (long-range goals and potential annual targets) to be budgeted for, monitored, and achieved. This approach might be used elsewhere in high priority habitat management areas.

This recovery plan is unusual, but there are other smaller-scale examples of Habitat restoration plans that follow a similar scenario, in which the prime sponsor or a collaborative process takes the lead and the Matrix programs provide support. The current performance measures in the Habitat Matrix Program reflect successful coping with legislatively mandated work assignments, rather than a plan to make strategic progress toward goals for maintaining or upgrading habitat conditions over large areas.

In general, the Habitat Matrix Program is not as specifically targeted to intended beneficiaries as many other programs in the sense that one of the PART questions asks about. Healthy habitats, as part of healthy ecosystems, benefit a very wide range of people, communities and industries. In certain instances, such as the Salmon Recovery Plan, the salmon industry, certain specific Indian tribes, and recreational fishermen might be singled out as special beneficiaries, but many others benefit as well.

However, some specific mandates addressed within the Matrix are targeted more directly to particular federal agencies being advised, to hydropower licensees applying for renewals, to industries that damage habitats, and to parties that create marine debris—for example. It was not possible, within the time and funding available in this study, for the Academy Panel to evaluate how effectively the Habitat Matrix Program benefits all these parties or the general public.

Investment Priorities

Marine and coastal habitats related to NOAA's trust responsibilities are very large and widely dispersed, and NOAA's mandates for improving these habitats are extensive and ambitious. At the same time, the Habitat Matrix Program is relatively small and new. So, priorities are very important, and pose one of the core questions for this Panel study:

Is the Habitat Matrix Program investing in the right areas to fulfill its mandates?

NOAA has been seeking answers to this question in two ways:

1. Developing strategic goals for improving habitat. In other words, getting at what is most important to accomplish
2. Establishing project selection criteria in the main programs that constitute the Habitat Matrix Program

This section of the Panel report examines the results of these two prioritization efforts.

Strategic goals for improving the effectiveness of habitat investments have been taking shape since the year 2000 when *The Estuary Restoration Act of 2000* established a national goal of restoring 1 million acres of coastal and marine habitat by 2010. NOAA developed a strategy to accomplish this goal. The Act authorized \$275 million over five years to begin working to achieve the goal and to enhance monitoring of the nation's coastal and marine habitats, data sharing, and research to undergird the effort. NOAA partnered with the non-profit organization Restore America's Estuaries to produce the required strategy, and it was issued in April 2002.

The 2002 strategy, *A National Strategy to Restore Coastal and Estuarine Habitat*, recommended:

- Regional Partnerships of governmental and non-governmental organizations, citizens, and volunteers—including public-private partnerships—to tackle this very large task
- Regional plans in six major regions of the nation to establish goals and priorities for closing gaps between existing habitat conditions and the conditions needed to enable these habitats to perform the functions required to support the living marine resources the nation needs. The rationale for these plans was that habitat restoration projects will be more effective if they are part of a larger, coordinated effort. The six regions named in the Act are:
 - Northeast Atlantic
 - Southeast Atlantic
 - Gulf of Mexico
 - California and the Pacific Islands
 - Pacific Northwest
 - Great Lakes

- Enhancing the knowledge-base available to design the most effective restoration projects, and an effort to apply this new knowledge widely
- Evaluating and monitoring the progress of implementation projects and the outcomes being achieved—at the watershed level
- Enhancing stewardship efforts to involve citizens, officials, businesses, and volunteers in the effort
- Achieving full funding of the 2000 authorization, and leveraging that funding as much as possible to enhance its effectiveness (not yet achieved in any subsequent fiscal year)

The likely implications of these recommendations for spending Habitat Program funds are:

- Increased funding of regional partnerships and their recommended planning processes
- Tying habitat restoration projects to the implementation priorities in the regional plans—to improve their effectiveness
- Providing adequate funding for enhancing project-design tools and getting them widely used, evaluating and monitoring progress toward improving habitat conditions, and enhancing stewardship efforts to supplement governmental funding
- Working toward full funding of authorized amounts and increased leveraging of available funding

In 2006, the secretaries of the U.S. Departments of the Interior and Commerce, and the chief executives of the Association of Fish and Wildlife Agencies issued another related report, the *National Fish Habitat Action Plan*. That plan sets the following specific objectives for moving this strategy forward:

- Conduct a condition analysis of all fish habitats within the United States by 2010.
- Identify priority fish habitats and establish Fish Habitat Partnerships targeting these habitats by 2010.
- Establish 12 or more Fish Habitat Partnerships throughout the United States by 2010.
- Prepare a “Status of Fish Habitats in the United States” report in 2010 and every five years thereafter.
- Protect all healthy and intact fish habitats by 2015.
- Improve the condition of 90 percent of priority habitats and species targeted by Fish Habitat Partnerships by 2020.

These new habitat protection and restoration objectives, of course, would require additional funding above FY 2008 appropriations levels.

This above chain of events—at the broad strategic/interagency level—provides a substantial foundation for considering future spending priorities in NOAA and other habitat programs both inside and outside of the Habitat Matrix Program. Nevertheless, this foundation could be used as

a reference point for developing, approving, and funding current implementation projects in the Habitat Matrix Program—in combination with the program’s own project selection criteria.

Project Selection Criteria are being used in five of the Habitat Matrix Program’s main component programs: DARRP, AISP, Marine Debris, Community-based Restoration, and Hydropower. Each program uses its own set of selection criteria, but several common elements emerge from a comparison, as shown in Table 2 on the following page.

The common elements are:

- Threats to NOAA trust resources
- Benefits expected from NOAA involvement
- Partnering potential
- Likelihood of project success
- Cost-effectiveness
- Regional or program balance
- Low priority or ineligible costs

In addition, a cost recovery factor is used by DARRP alone.

It is interesting to note that consistency with existing habitat restoration plans—or plans that incorporate habitat restoration recommendations—is only mentioned in the existing project or case selection criteria by three programs. This is a very common provision in many other federal-aid programs.

The Panel believes that the current criteria help to ensure that the projects being undertaken now are sound and in accordance with good current practices. However, their strategic impact is not clearly demonstrated.

Ability of the Program’s Performance Measures to Demonstrate Progress Toward Achieving Long-Term Goals

For this evaluation, the Panel had to rely largely on the existing performance measures, targets and milestones being used now in the Habitat Matrix Program. The Panel selected a sub-set of 30-some metrics, which are displayed in Table 3 on pages 28-30. Some of these measures and milestones are used at the Habitat Matrix Program level and some depict only an individual component program. The milestones specify the work expected to be accomplished with available funding in that year. The targets related to these measures are shown, when available, in parentheses next to the measure. The metrics are coded in the left-most column as performance measures (PM#) or milestones (ID# or M#), and by colors, that indicate which of the three main Habitat goals they contribute to most directly.

Table 2 : Habitat Matrix Project/Case Selection Criteria

Criteria	Programs				
	DARRP	AISP	MDP	CRP	Hydropower
Threats to NOAA Resources	<ul style="list-style-type: none"> Threat to NOAA Resources 	<ul style="list-style-type: none"> Threat to NOAA resources Potential magnitude of impact 	<ul style="list-style-type: none"> Threats to NOAA Resources Threats to living marine resources 	<ul style="list-style-type: none"> Address threats to NOAA resources 	
Benefits of NOAA Involvement	<ul style="list-style-type: none"> Potential benefits of NOAA involvement Visibility Project consistency with other local restoration plans 	<ul style="list-style-type: none"> Potential value added of NOAA involvement Benefits to the NOAA AISP Specific, obtainable objectives 	<ul style="list-style-type: none"> Potential benefits to NOAA knowledge base Identified goals and objectives Location Benefits to species, habitat Debris types being addressed 	<ul style="list-style-type: none"> Identified goals & specific objectives On-the-ground implementation Consistency with salmon recovery plans Net gain in habitat acres restored or stream miles made accessible Benefits to multiple species Social & economic importance 	<ul style="list-style-type: none"> Consistency with Federal Plans, Regulations and Statutes Habitat and Fishery Benefits Impact on Commercial and Recreational Fishing
Partnering Potential	<ul style="list-style-type: none"> Potential to improve or strengthen partnerships 	<ul style="list-style-type: none"> Interest level among NOAA and other stakeholders Potential to leverage partner funding International/ inter-agency commitments to build on 	<ul style="list-style-type: none"> Maximize partnerships, collaborations, and leveraging funds Potential for long-term partnerships Potential for long-term stewardship 	<ul style="list-style-type: none"> Maximize partnerships, collaborations, & leveraging of funds Potential for long-term stewardship 	
Likelihood of Success	<ul style="list-style-type: none"> Feasibility 	<ul style="list-style-type: none"> Availability of NOAA and other capabilities to help existing efforts underway 	<ul style="list-style-type: none"> Likelihood debris will reaccumulate Feasibility Likelihood of long-term solution Responsibility/availability of other resources Use of proven techniques 	<ul style="list-style-type: none"> Monitoring of restoration success Strong community support Landowner support and assurance of protection Hands-on volunteer involvement in implementation Use of sound proven restoration techniques Degree to which the restoration methods are self-sustaining and/or an appropriate maintenance plan is in place 	<ul style="list-style-type: none"> Consistency with Tribal Trust Rights and intergovernmental relations Consistency with state policies and objectives Support of environmental groups and localities Likelihood NOAA can prevail in trial type hearing
Cost-effectiveness	<ul style="list-style-type: none"> Cost-effectiveness 		<ul style="list-style-type: none"> Demonstrated need Cost-benefit ratio Level of non-federal match or leverage 	<ul style="list-style-type: none"> Demonstrated need Cost-benefit ratio Level of non-federal match or leverage 	
Regional Balance		<ul style="list-style-type: none"> Regional balance 	<ul style="list-style-type: none"> Balance of debris types being addressed and threat to resources 	<ul style="list-style-type: none"> Regional balance 	
Low Priority or Ineligible Costs			<ul style="list-style-type: none"> Volunteer beach cleanups Small impact On-going events 	<ul style="list-style-type: none"> Purchase of land, conservation easements, and large equipment Pre-award costs Organizational support Mitigation activities 	

Table 3: Habitat Matrix Program Performance Measures and Milestones

Goals	Measure No.	Description	Matrix Programs to which Measure Applies							Fiscal Years					Measure Type	
			Protection		Restoration		DARRP	AISP	MDP	NCBO	FY04 (target)	FY05 (target)	FY06 (target)	FY07 (target)		FY08 (target)
			EFH	Hydro	CRP	CW-PPRA										
R	PM-1	Acres of habitat restored			X	X	X			X	5563 (3,760)	8333 (4500)	7598 (4500)	5974 (5000)	11,254 (9000)	intermediate outcome/annual
	ID2028 M-9	Complete and release to the public 4 Damage Assessment and Restoration Plans that describe projects and/or actions to restore coastal resources damaged or injured by oil spills, hazardous releases or other incidents.					X				4	6	4	4	4 (5)	output/annual
	ID1969 M-15	Implement 200 projects that restore fish habitat, including essential fish habitat and habitats necessary for the recovery of endangered and threatened species.			X		X			X	250	200	200	150	245 (200)	output/annual
	M-53	Provide required information concerning the directed cooperative agreement between NOAA and Coastal Restoration and Enhancement through Science and Technology (CREST) to transfer FY 2008 funds that will continue to support and improve the ability of practitioners in the Gulf of Mexico to restore critically important coastal habitat.				X	X				fund at least 10 research projects	*Funds not appropriated	Yes	*Funds not appropriated	Yes	output/annual
	PM-2	Stream miles made accessible—RC & DARRP & hydro		X	X		X				410 (410)	199 (200)	200 (150)	675 (400)	623 (475)	intermediate outcome/annual
	ID2034 M-16	Provide, prescribe, or recommend improvements to fish access at 95 hydrological barriers (FERC and non-FERC).		X	X		X				12 hydro barriers	15 hydro barriers	25 hydro barriers	25 hydro barriers	139 (95 hydro barriers)	output/annual
	PM-3	Technical guidance and assistance provided to NOAA partners, federal action agencies, and resource decision makers to achieve protection and restoration of NOAA trust resources.	*	*	X		X				300 partners (300)	8,989 habitat related efforts (10,000)	3,416 habitat related efforts (4,000)	2,958 habitat related efforts (3,400)	2,384 (2,530)	output/annual
	ID2042, ID2060, ID2061, ID2062 M-4	Provide technical support to CERCLA lead agencies, investigate potential injury to NOAA trust resources, develop protective remedial strategies and mitigative actions, and address contaminated sediments to protect and restore NOAA trust resources at approximately 30 sites each quarter. (NB: This also applies to PM-5)					X				90	90	50	50	Q1=37 Q2=30 Q3=43 Q4=47 (30)	output/annual

Table 3 -- Continued

S	PM-4	Coastal community participation associated with habitat protection, restoration, education and outreach.			X	X	X				126 communities (125)	193,494 volunteer hours (85,000)	100,349 volunteer hours (100,000)	120,650 volunteer hours (85,000)	149,156 (85,000) volunteer hours	output/annual	
P	PM-5	Number of hazardous waste sites where assessment or cleanup plans address risks to NOAA trust resources.					X				18 (NA)	14 (12)	17 (7)	35 (10)	22 (10)	output/annual	
R	PM-6	Number of Natural Resource Damage Assessment cases where liability is resolved.					X				4 (NA)	5 (5)	8 (3)	5 (3)	6 (3)	output/annual	
	ID1975 M-8	Achieve significant progress toward completing 8 natural resource damage assessments or cases settled to recover funds for restoration of coastal resources.					X					6 cases	4 cases or assessments	8 cases or assessments	16 cases (8 cases or assessments)	output/annual	
P	PM-7	Percentage of proposed actions that were modified per NOAA Fisheries' advice to reduce adverse effects to habitats for living marine resources	X										91% (60%)	94% (60%)	92% (90%)	intermediate outcome/annual	
	PM-8	Percentage of interagency habitat consultations for which early coordination and/or information dissemination eliminated the need for NOAA Fisheries to make conservation recommendations on action agencies' final decisions	X										14% (20%)	21% (20%)	20% (20%)	intermediate outcome/annual	
	PM-9	Percentage of interagency habitat consultations completed within established timeframes	X										88% (90%)	90% (85%)	88% (85%)	output/annual	
	PM-10 (Specific to AISP)	Protect NOAA trust resources by reducing the risk of introducing or spreading invasive species populations by addressing pathways of movement or through facilitating the eradication, containment, or mitigation of existing invasive populations (combined new in FY08) <u>Yearly Target - One (1) population or pathway</u>						X				1 species (1species)	1 species (1 species)	1 pop. 1 path. (1 population)	1 pop (1 pop. or path.)	intermediate outcome/annual	
	AISP Project Tracking Data by Capability	Prevention:	Number of Projects					X				4	13	13	5	(9)	Annual Output Measures
			Total dollars (\$thousands)					X				\$2,412	\$3,085	\$2,867	\$1,227	(\$2,576)	
			Percentage earmarked					X				100%	100%	100%	98%	(0%)	
		Mgmt/Control:	Number of Projects					X				6	3	22	20	(20)	
			Total dollars (\$thousands)					X				\$2,341	\$1,710	\$3,102	\$953	(\$1,470)	
			Percentage earmarked					X				75%	100%	70%	0%	(46%)	
Detect/Response:		Number of Projects					X						1	2	(4)		
		Total dollars (\$thousands)					X							35	151	(181)	
	Percentage earmarked					X							0%	0%	(0%)		

Table 3 -- Continued

Goals*	Measure No.	Description	Matrix Programs to which Measure Applies							Fiscal Years					Measure Type	
			Protection		Restoration		DARRP	AISP	MDP	NCBO	FY04 (target)	FY05 (target)	FY06 (target)	FY07 (target)		FY08 (target)
			EFH	Hydro	CRP	CW-PPRA										
R	PM-11	Percentage of habitat restoration projects for which monitoring is defined by the grantee and/or principal investigator.			X	?					90%	86%	81%	76% (75%)	output/annual	
P	PM-12	Percentage of all proposed actions that may adversely affect NOAA trust resources reviewed to assess potential effects.	X								82%	75%	85%	85% (80%)	output/annual	
	NCBO - specific performance measures	Technical guidance reports issued							X	2	2	2	2	(5)	output/annual	
		Number of square km of benthic habitat characterized and mapped							X		43	79	46	(49)	output/annual	
		Number of square km of habitat assessed for fisheries utilization							X					(10)	output/annual	
		Cumulative number of observing system components successfully deployed. (Note: Eventually, a separate measure will capture information provided by the observing system relating to improved decision-making and public safety.)							X			1	4	(6)	output/cumulative	
S	NCBO - specific performance measures	Number of teachers/students & EE professionals reached with environmental education							X	17,000	30,000	44,000	12,000	(44,000)	output/annual	
		Hours spent educating municipal officials							X					(1,200)	output/annual	
R	PM-13	Internal Performance Measure: Restore nearshore and open-ocean habitat by increasing the amount of marine debris removed (by metric tons). (new in FY08)												838.5 metric tons (300 metric tons)	output/annual	
P	PM-14	Internal Performance Measure: Protect habitat and Trust Resources by increasing the amount of used fishing gear (not lost gear removed from the marine environment) collected annually through alternative monofilament recycling or port reception facilities (by metric tons). (new in FY08)												67.4 metric tons (5 metric tons)	output/annual	
	PM-15	Internal Performance Measure: Percentage of existing fishery management plans (FMPs) reviewed within the past five years to update essential fish habitat (EFH) information per the EFH regulatory guidelines. (new in FY08)	X											64% (70%)	output/annual	
R	PM-16	Internal Performance (efficiency) Measure: Habitat restoration effectiveness per allocated program funding. (new in FY08)			X									0.5 (0.5)	efficiency/annual	

NOTES: Milestones are reported as met or unmet (yes/no) OR where totals are provided, they indicate what was proposed and reported as met, not necessarily the actual number completed, which may be greater. Actual milestone data are available for 2008.

* Habitat Protection programs cease contributing to PM-3 in FY2009.

• Goals: P-Protection, R-Restoration, S-Stewardship

Sixteen of the program's current measures are considered the main performance measures. The majority of them track the program's activity levels and do not directly measure the program's progress toward achieving its stated long-term goals. However, approximately one-third of the current measures show that the Habitat Matrix Program is making significant progress in carrying out activities that logically could be expected to produce the intended program outcomes. Restoring acres of habitat, opening up miles of streams for fish passage, and recommending modifications to infrastructure projects and other activities should all reasonably be expected to lead to improved coastal and estuarine ecosystems and improved habitat for living marine resources. However, the Program is not currently able to document and quantify the extent to which these outcomes reflect the program's long-term goals.

An effort is underway within the Matrix Program to designate a small number of the sixteen performance measures as of prime importance for general reporting. Efforts also are underway to modify and improve these measures and group some of the other measures under them to assist in most effectively telling the story of Habitat protection and restoration success. This change is an important step in the right direction, and should simplify reporting of the key essentials of this complex, multi-part program.

Of the current targets being used in the Habitat Matrix Program, 27 percent have data for 4 or 5 years. Eight percent have data for 3 years, and 59 percent are new for FY 2008. Further work is needed on targets to explain their meaning and the rationale for choosing them, and to make their values explicit. The significance of the current targets is not apparent on their face. Of the 13 current targets with a track record of 3 years or more, 8 generally were met, 4 generally were exceeded, and only one target was not met.

Box 1 on page 32 displays the concepts currently under consideration by the Habitat Matrix Program leadership.

The Panel believes that these concepts are moving in the right direction, and encourages their further development. The Panel notes that the measures expressed as percentages are easier to understand than those expressed as raw numbers, because they compare to a transparent baseline. The raw numbers need one or more points of reference other than their own time series to help explain their significance. A "dashboard" type presentation offers a convenient mechanism that could be used for this purpose.

The Panel also notes that the measure of NOAA recommendation "fully accepted and/or implemented" sets a very high bar for success. Much good work by NOAA could go unreported by this measure. NOAA should consider some means of recording "partial credit" for other good works accomplished.

Box 1: Straw Man—Short Term Performance Measure Concepts for the Habitat Program

Objectives:

- Develop fewer, higher level performance measures for the Habitat Program to use in the short term to convey the accomplishments across the program
- Use these measures to better tell the story of Habitat Program accomplishments in the short term, while working towards long-term outcome-based measures

Approach:

We will work toward longer-term, outcome performance measures and in the short term, develop measures to better reflect the accomplishments of the Program:

- Identify 5-6 priority performance measures that:
 - Are easily understood by an outside audience
 - Represent a significant portion of the outputs, products and services delivered by the Program
 - Represent, to the extent possible, outcomes of our work
 - Are most useful in conveying the value of the Program
 - May be regionally based and aggregate up
 - Could be based on existing measures or broadening existing measures to capture accomplishments across the Program
- Organize or link measures to the three Program Goals; Protect, Restore, Stewardship
- Set 5-year goals and annual targets for each of the measures, using the best available information and review/input from a set of external experts

Concepts for Improved Habitat Performance Measures

Primary measure	Possible complementary measures that make the link to outcomes (Note: all these measures would involve taking a sample to estimate for the whole).
Number of coastal, marine and Great Lakes habitat acres restored or protected. <i>(restoration includes marine debris removed; protection includes long term easements, acquisition, prevention of invasives, special management areas)</i>	<ul style="list-style-type: none"> • % of projects monitored that achieved pre-determined design objectives within 2 yrs • # of project areas where an impact has been successfully addressed (e.g., # coral reefs where sedimentation has been reduced)
Number of stream miles opened and accessible for coastal, marine and Great Lakes species.	<ul style="list-style-type: none"> • # of project areas [e.g., sub watersheds, rivers, or main stems] where fish passage is no longer limiting • # of endangered/threatened stocks/ESUs benefitted • % of projects that show increased presence of a listed species or a proxy species within 5 years
Number of recommendations that protect coastal, marine and Great Lakes habitat.	<ul style="list-style-type: none"> • % of recommendations fully accepted and/or implemented to reduce or prevent impacts to NOAA trust resources
Number of hours of coastal community participation associated with habitat protection, restoration, education and outreach.	<ul style="list-style-type: none"> • % of participants surveyed that show an increased knowledge of and stewardship for coastal, marine and Great Lakes habitats. • % of participants who have previously participated in habitat protection, restoration, education, or outreach experience.

Information from Prior Evaluations and Accomplishment Reports

Two other sources of information about the accomplishments and effectiveness of the programs within the Matrix were reviewed for this study: formal evaluation studies and accomplishments reports. Numbers, by themselves, do not tell the full story of complex programs like this one. The numbers can and should be supplemented with real stories that can often make a particular point more powerfully. Prior evaluation reports can be an excellent source of information and insights about the need for program improvements.

In the course of evaluating the Habitat Matrix Program, the Panel reviewed 20 prior evaluations prepared by others in the year 2000 or later. A summary of these evaluations is provided in Appendix B.

- Five of the prior evaluations were for broad programs that interact with the Habitat Matrix Program and broadly contribute to the goals of protection, restoration, or stewardship, but are not directly part of the Matrix. These programs are:
 - NOAA's Coastal Zone Management (CZM) Program, which includes habitat conservation and restoration as one of its many goals.
 - The U.S. Fish and Wildlife Service's (FWS) Fisheries Program, which has a strong habitat component
 - The Chesapeake Bay Program, which has EPA, NOAA, and many other agency components and a strong emphasis on habitat conservation and restoration
- Eight of the prior evaluations involved habitat protection related to:
 - Fisheries Management
 - Essential Fish Habitat
 - Hydropower Dam Licensing
 - Invasive Species
- Five of the prior evaluations involved habitat restoration related to:
 - Wetlands
 - Pacific Salmon Recovery
 - Dam removal
 - Marine debris
 - (and a stakeholder feedback workshop on the Community-based Restoration Program, which is reviewed in a later section of this report in a broader section dealing with stakeholder views)
- Two of the prior evaluations were related to habitat stewardship and were related to:
 - The Chesapeake Bay Watershed Education and Training (B-WET) Program

- Volunteering in three estuary programs (Tampa Bay, San Francisco Bay, and Galveston Bay)

These prior evaluations touch on all portions of the Habitat Matrix Program except the DARRP program. DARRP undergoes annual reviews of its costs – both direct and indirect – by Cotton and Company, but the Panel did not examine those.

The Panel found these prior evaluations to be a rich source of information and recommendations for improving the various components of the Habitat Matrix Program. The prior reviews included OMB PART evaluations of EPA’s Chesapeake Bay Program, NOAA’s CZM Program, and the FWS’ Fisheries Program. These program-related PART reviews are a useful source of information about what OMB looks for in natural resource protection programs.

NOAA Accomplishments Reports for Programs in the Habitat Matrix

The Panel had available to it the following accomplishments reports for programs included in the Habitat Matrix Program:

- *NOAA Fisheries Habitat Program: 2007 Accomplishments*, a 21-page illustrated booklet.
- *Accomplishments of the Alaska Region’s Habitat Conservation Division*, for fiscal years 2003-2007 (five separate annual reports of 8-9 pages each).
- *Healing Our Coasts, Protecting Our Future: 15 Years of Protection and Restoration of the Nation’s Coastal Resources*, NOAA Damage Assessment, Remediation, and Restoration Program, April 2007, 28 pp. This report provides a fairly thorough overview of the first 15 years of the program. The Panel also had access to a two-page description of five FY 2007 examples of specific project accomplishments (one paragraph each)—plus separate two-page flyers on examples of specific accomplishments in California and Massachusetts.
- *Marine Debris Program Accomplishments for FY 2008*, a two-page list of seven specific activities—one paragraph each.
- *Cooperative Habitat Protection Partnerships: Promoting Local Strategies to Protect Coastal and Marine Fish Habitat*, a two-page illustrated brochure with examples of six local projects funded by the NOAA Office of Habitat Conservation, undated.
- *NOAA Chesapeake Bay Office Biennial Report to Congress: 2007-2008*, a formal required report; 28 pages, illustrated (pre-release version).
- *Hands on Habitat: Celebrating 10 Years of Coastal Restoration*, NOAA Community-Based Restoration Program Portfolio of Success, a 73-page formally printed report, March 2006. This report provides descriptions of successful restoration projects region-by-region and state-by-state all across the United States.

These documents present a wide variety of approaches to accomplishment reporting by specific programs within the Habitat Matrix Program. However, they do not cover the whole range of programs within the Matrix, and none is designed to represent the Habitat Matrix Program as a

whole. NOAA recently began encouraging each of its programs to provide annual accomplishments reports.

These are very interesting documents and they are especially useful for communicating a general sense of what these programs do to a non-technical audience. However, they are not useful for program evaluation or management—with one exception. The NOAA Chesapeake Bay Office's report, required by law, does provide some performance data for part of its work. It is longer and somewhat more analytical than most of the other accomplishment reports reviewed by the Panel.

Accomplishments reports are useful for communicating with the general public, volunteers, and others. They should be encouraged and more consistently issued as part of the effort to keep the public informed and to help enlarge habitat stewardship efforts. The Habitat Matrix Program might benefit from having a regular annual accomplishments report of its own—to begin building its “brand” recognition and to emphasize how its component elements work together to generate larger results than any of them can achieve alone.

Stakeholder Views of the Habitat Matrix Program

This section summarizes stakeholder views of Habitat Matrix programs solicited on two different occasions—an Academy Panel meeting on the NOAA Habitat Matrix Program Evaluation study held on November 6, 2008 and a stakeholder meeting concerning the Community-based Restoration Program hosted by NOAA on September 13, 2005.

Stakeholders represented at the 2008 Panel meeting ranged in type and focus.

- American Rivers (John Seebach)—This representative of American Rivers was the director of the group's Hydropower Reform Initiative and Chair of the Executive Steering Committee of the multimember Hydropower Reform Coalition. His focus and that of the Coalition is FERC relicensing of hydropower dams.
- Marine Fish Conservation Network (Bruce Stedman)—This organization focuses on implementation of the Magnuson-Stevens Act and fish habitat protection.
- National Fish and Wildlife Foundation (Mike Slattery)—The Foundation is a non-profit chartered by Congress to provide federal environmental protection mission agencies a mechanism that can act more nimbly and flexibly in administering and managing grant funds, leveraging other funds, and collaborating with partners.
- U.S. Fish and Wildlife Service (Gary Frazer)—A partner federal agency with overlapping and complementary program responsibilities. The agency has undergone efforts to develop and implement a performance management system similar to the effort now being undertaken by NOAA's Habitat Matrix Program.

All of these stakeholders had direct experience with NOAA and the Habitat Matrix Program. However, none had more than a vague perception of the Matrix as a whole. They had clearer perceptions of individual programs within the Matrix.

Their remarks fell into three broad thematic categories:

- Broadening frameworks for thinking about habitat
- Importance of partnerships
- Difficulties in measuring performance

Broadening Frameworks for Thinking about Habitat

Seebach indicated that providing for fish passage is just one factor in restoring and protecting fish habitat. He also emphasized the importance of water flow as a key factor in the health of fish populations in riverine habitats. However, he noted that NOAA is less well positioned to affect water flow in its consultations on the relicensing of hydropower dams.

Seebach also discussed the importance taking a strategic approach to FERC relicensing cases to have a greater impact. He said that both NOAA and American Rivers tend to be opportunistic and case driven. Both are largely driven by the schedule of relicensing applications, and need to place them in the context of comprehensive watershed plans, and target those applications that will have the greatest impact on high priority fish habitats.

Both Stedman and Slattery encouraged NOAA to take a broader view of what constitutes effective fish habitat. They focused on the importance of including forage fish in effective ecosystem assessments and plans for protecting fish habitats. Slattery said that the National Fish and Wildlife Foundation includes forage fish as a focus cutting across its four recently established “keystone” priorities.

Threats posed by climate change figured explicitly in the comments of both of these stakeholder representatives. Seebach noted that climate change is undermining the basis for assessments needed to guide recommendations on restoring riverine water flow patterns. Stedman emphasized the potentially very serious threat of climate change to NOAA’s habitat protection efforts generally.

Importance of Partnerships

The importance of partnerships figured prominently in the remarks of both Frazer and Slattery. They discussed the potential of partnerships to increase access to the information, resources (money, staff, and authority), and expertise needed to address the broad scope and complexity of environmental challenges. Frazer emphasized the challenges of building partnerships—long-term, uncertain efforts. Slattery emphasized shrinking resources available to provide a reliable base of support for partnerships.

Slattery also discussed the role that the National Fish and Wildlife Foundation plays in supporting partnerships and other collaborative activities, and offered the Foundation’s services for even broader use. He reviewed the Foundation’s ability to pool money from multiple federal agencies and to broker collaborative relationships among agencies, and noted the Foundation’s recent expansion of its role to include program planning and development, information sharing and networking activities, and the provision of technical assistance to federal agency grantees.

Difficulties in Measuring Performance

Seebach discussed the challenge his organization faced in developing a set of metrics that adequately measures the performance of its activities related to FERC relicensing of hydropower dams. He emphasized that a measure of success must incorporate information about whether fish passage plans were implemented and whether the passages worked as planned. However, he noted that limited data are available on resulting improvements in habitat conditions, ecological systems, and fish populations. He also noted the lack of resources and interest by funders to support the long-term monitoring and assessment needed to collect the data needed to inform these measures. He explained that monitoring and assessment are “not sexy” and do not provide the near term sense of accomplishments that dam removals and fish passage provisions do.

The opportunity to fund NOAA monitoring and measurement costs of the Hydropower program by recovering the costs from other parties was discussed. However, participants agreed that this provision would not produce funds that NOAA could use unless the present law is changed.

Based on FWS experience, Frazer counseled NOAA to develop a flexible, open-ended set of indicators that can guide, but not unduly constrain managers in adapting to changing budget and other circumstances. He also emphasized the importance of partnerships for measuring key factors and noted the promising example of such a framework highlighted in the National Fish Habitat Action Plan.

Stakeholder Feedback from 2005 Meeting on the Community-based Restoration Program

On September 13, 2005 NOAA brought together 29 of its partners in the Community-based Restoration Program. This full-day facilitated meeting examined six main topics:

1. Research and Monitoring
2. Regional Planning and Prioritization
3. Technical Assistance Needs
4. Funding and Program Growth
5. Interagency Coordination and Permitting
6. Outreach and Education

For each topic, the report on the meeting provides (1) a summary of the meeting notes, (2) recommendations of the meeting participants, and (3) responses by NOAA.⁵ The report is a rich source of feedback on one of the main program elements in the Habitat Matrix Program. It is the only instance of stakeholder feedback found within the Matrix family of programs.⁶

⁵ NOAA Restoration Center, *NOAA's Community-based Restoration Program: Stakeholder Meeting Summary Report*, September 13, 2005 (January 2006).

⁶ Although NOAA's Marine Debris Program began holding annual Information Forums to bring together the principal investigators of its programs for presentations and information exchange, that activity does not provide

A very brief summary of the main points made by the stakeholders follows. It provides a sense of the value of soliciting such feedback.

Research and Monitoring. The stakeholders felt that long-term monitoring of the results of restoration actions—at a regional scale—should be a high priority because it provides many benefits. The benefits include: accountability for dollars spent, recognizing the value of using volunteers, providing research data to show the value of using improved techniques and practices, documenting improvements in ecosystem conditions, and tracking long-term trends. To be most effective, a way should be found to extend the monitoring of results beyond the end of individual Restoration project grants. Additional funding and technical support for research and monitoring was recommended, as well as stronger links between the regionally-based Restoration Centers and NOAA’s regionally-based Science Centers.

Regional Planning and Prioritization. More national and regional restoration plans are needed to provide a more solid foundation for selecting and prioritizing project funding based on better-defined restoration goals and performance measures. Such plans would facilitate nesting of regional and local priorities, using limited resources more strategically and efficiently, better aligning the efforts of grass-roots and volunteer groups, and using monitoring and research practices more effectively.

Technical Assistance Needs. Stakeholders praised the positive assistance they receive from staff of the Restoration Center, and enumerated several types of essential assistance being provided. They asked for more such assistance—emphasizing the need for building networks with other programs within NOAA and with programs and sources of expertise in other federal and state agencies, local governments, NGOs, and other grantees like themselves. They recommended regular “lessons-learned” workshops, new searchable databases, and other improvements that would help to build their capacity to do a better job.

Funding and Program Growth. As might be expected, the stakeholders recommended more funding, better leveraging of partner funds, and greater flexibility in using the funds. In particular, they recommended greater ability to use funds to cover administrative and technical assistance activities, increasingly expensive land costs, and long-term research and monitoring activities. A number of other specific recommendations were made, including streamlining paperwork and reporting requirements, and providing longer-term funding options.

Interagency Coordination and Permitting. Stakeholders stressed the importance of interagency coordination in prioritizing habitat goals and long-term funding programs, as well as the permit processes through which key actions affecting habitat conditions are often implemented. This is essential to avoid frustrating project delays and to align the efforts of multiple agencies. The Fish and Wildlife Service and the Army Corps of Engineers were mentioned most prominently. A strong role for NOAA in brokering this coordination was recommended, and the need to train all the participants to work the system effectively and efficiently—including state and local

equivalent stakeholder feedback of the type reported on in this section of the Academy Panel’s report. Therefore, it is not included in this analysis.

governments and others—was emphasized. The need for interagency workshops was also mentioned.

Outreach and Education. The stakeholders recommended increased outreach and education—including efforts to attract students into the habitat field, provide them with internships and get them on a career path. Collaboration with NOAA’s Education Office was also recommended, as were better accessibility of “how to” manuals and guidance documents, and web-based resources. Revising the Restoration Center’s website was a top priority for these stakeholders.

Overall Perception of NOAA Habitat Programs

Although the information available to the Panel about stakeholder views of NOAA’s habitat programs was limited, the predominant views expressed in both the 2008 and 2005 instances cited above were very positive. Most criticism was constructive. Many recommendations for improvement were made. One speaker in the 2008 meeting felt that NOAA is more rigid in administering its programs than other federal natural resources agencies, perhaps because of NOAA’s heavy focus on legislative mandates and frequent consultations with lawyers. Overall, both of these consultations demonstrated the value of maintaining constructive dialogue between NOAA’s Habitat Matrix Program and its stakeholders.

Summary Evaluation

- The Matrix Program has no overarching authority or mandate; as a result it has no strong sense of purpose or clear set of priorities. However, some clearer purposes and priorities exist within the core program components.
- Resources do not match the scope and scale of problems that the program is intended to address.
- The Matrix Program has achieved administrative coordination but has not realized its potential in working to coordinate and leverage activities and goals across its core components to set and achieve common priority outcomes.
- A caseload management approach dominates this suite of programs. All of the individual programs in the Matrix are too small to address all the cases that come before them. They all make choices about which opportunities to engage in.
- The small size and limited authorities of the Habitat Matrix Program magnifies its need to take a more strategic approach to planning and prioritizing a more proactive program.
- Within that context, these programs appear to be effective. They deal with a fairly high percentage of the cases presented to them, and make positive contributions that logically should lead to their intended outcomes. Activities such as restoring acres and stream miles of habitat and recommending modifications of infrastructure and hydropower projects address significant threats and should lead to improved habitat and ecological functions.
- However, the program cannot yet demonstrate and measure successful achievement of outcomes.

- Another challenge is the inadequacy of information and assessments to (1) characterize current habitat conditions, (2) identify priority locations and threats that should be addressed, and (3) monitor progress.
- While no comprehensive habitat plan exists that could guide program investments, there are multiple efforts at regional or watershed scales to prioritize restoration and conservation activities for specific estuaries or species.

RECOMMENDATIONS FOR IMPROVING THE EFFECTIVENESS OF THE HABITAT MATRIX PROGRAM

Recommendations for Strengthening the Overall Habitat Matrix Program

- NOAA should pursue a more holistic overarching authority or mandate for the Habitat Matrix Program. This program is still defined more by its parts than its whole. The two Ocean Commissions recommended creating a NOAA Organic Act. Doing so would create an excellent opportunity to provide a stronger mission, clearer purpose, and higher priority for the NOAA Habitat Program. The Habitat Matrix Program charter should be redrawn to include its overarching purposes and goals.
- The Habitat Matrix Program leadership should continue to refine the overall, intermediate, and individual program logic models begun during this study and use them to strengthen the program designs they have begun to develop. This effort should be refined annually, based on each year's experience and regular consultations with external stakeholders. The Habitat Program leadership should continue to pull this program together into a more seamless and effective whole. And the NOAA Administrator and/or Congress should support this goal by raising the priority of Habitat closer to a level on a par with fish populations. Habitats and living marine resources are inseparable.
- The Habitat Matrix Program leadership should play a stronger role in prioritizing activities across programs, looking for opportunities to leverage activities and outcomes. For example, restoration activities could be prioritized to parallel upcoming consultation activities, so that multiple threats in a given watershed are addressed in concert.
- NOAA should use its participation in interagency committees to link environmental stewardship and habitat conservation strategies across agencies, to help increase their combined program impacts, and to boost program performance for all the partners. These linkages could help to (1) pool funds for habitat characterization, condition assessment, habitat protection and restoration planning, and other purposes that can help to improve the effectiveness of Habitat Matrix Program performance, and (2) secure agreement on commonly used measures of Habitat condition characterization and assessment, as well as on cross-agency collection and sharing of such data.
- The NOAA Administrator should direct fisheries management programs to add habitat to their stakeholder efforts, data and information needs, and other efforts to gain the benefits of stronger programmatic connections between fisheries managers and the NOAA Habitat Program. This should be done regionally and nationally, to benefit the agency's

management efforts on individual fish stocks and to broader efforts at the coast or national scale.

- NOAA should make better use of the capabilities within the Habitat Matrix Program by directing existing NOAA programs with habitat protection and restoration activities to integrate more closely with the Habitat Program. Complementary efforts exist with NOAA programs, including the Protected Species Program, Fisheries Management Program, and Coastal and Marine Resources Program. NOAA should direct future programs that require restoration and protection of coastal and marine habitats to operate as a component of the Habitat Matrix Program. This would ensure NOAA resources are being used efficiently and effectively with the expertise and capabilities of the Habitat Program.

Recommendations for Revising Investment Priorities of the Habitat Matrix Program

The Habitat Matrix Program leaders should:

- Explore development of criteria for prioritizing Habitat Matrix projects, and base this effort, in part, on a comparison of criteria currently being used by the programs in the Habitat Matrix Program. Potential criteria to consider might include:
 - Imminent loss of important habitat
 - Endangered and threatened species affected
 - Wide area impact of improvement opportunity
 - Opportunity to expand the use of pre-consultations, which are more efficient and more effective
 - Opportunities for preventing habitat degradation, which is usually less expensive than restoration
 - Require Habitat Matrix Program projects to be consistent with existing watershed habitat plans or species recovery plans. NOAA's Habitat Program should serve as an integrator of such plans.
- Develop and spread the use of standard criteria for prioritizing the spending of funds available to the programs in the Habitat Matrix. This would involve analyzing, formalizing, and augmenting the criteria currently being used by programs throughout the Matrix, and consulting with the program's stakeholders on a periodic basis to enrich and validate the criteria.
- Hold regular stakeholder workshops to elicit input.
- Provide incentives to undertake broad-area activities to a larger extent than at present.
- Encourage greater use of pre-consultations and stakeholder education to reduce the number of cases in which formal, often contentious, consultations are required.
- Invest more time and resources in assessments and consultations related to integrated ecosystem planning for whole watersheds or restoration domains (for example), rather than consultations targeted to individual current development or re-licensing

proposals. But that could allow some very negative impacts to occur in the short run and would defer immediate results (such as acres restored and stream-miles made available) until later, when actual projects occur—a truly hard choice. Time spent consulting on a large-scale plan, which may have long-term positive impacts on a large number of projects having potentials to seriously damage habitats, often is time not spent on protecting a habitat against a smaller project that presents an immediate threat. Nevertheless, some regions of the country do more of the broader consultations than other regions. This practice should become much more common across NOAA.

- Support increased use of NOAA-wide research, science, characterization, and assessment funding for the benefit of the Habitat Matrix Program. Science support for the Habitat Program should be on a par with, and integrated with science support for fish populations. The axiom of “no habitat, no fish,” is becoming increasingly clear as human pressures on nature continue to grow. To assist this integration, habitat research might be tied to specific species in some cases. This science support is essential to establishing the baseline needed to measure progress toward program goals. NOAA as a whole would benefit by devoting increased habitat science capabilities to better understand and quantify the relationships between managed species, marine debris, invasive species and habitats. Enhanced scientific understanding of ecosystem processes and services, including the socio-economic value of habitats and of industry sectors with a direct linkage to the marine environment, will improve ecosystem-based management of coastal and marine habitats. In turn, this will provide the Habitat Matrix Program with critical information to achieve long-term outcomes related to protected species, harvested species, and ecosystem services related to other NOAA mandates. NOAA should consider the Habitat Program priorities in agency-wide science efforts, and should direct more resources toward habitat science and incorporate habitat variables in ecosystem based assessments. Habitat science should be integrated within existing frameworks and assessments within NOAA.

Recommendations for Strengthening Performance Measures for the Whole Matrix

- **Short Term Goal**— The Habitat Matrix Program leadership should select a few of the best existing program output measures based on their ability to tell the story of the overall habitat protection and enhancement goals,⁷ roll-up across geographic locations into a small set of national measures representing the key goals of the Matrix programs, and rely on scientifically and technically valid quantitative information.
 - Group the highlighted measures (and related subsidiary measures) by the three main Program goals.
 - Adjust existing performance measures, in the short run, to transform them into intermediate outcomes of the “better off than they would have been” variety.

⁷ The five measures tentatively selected at a program leadership workshop on October 28, 2008 were: (1) acres of habitat restored, (2) stream-miles made accessible, (3) citizen stewardship encouraged, (4) liability cases resolved for natural resource damage incidents, and (5) actions by others that were modified to reflect NOAA advice.

- Emphasize the importance of setting quantified long-term goals and short-term targets for the next five years to show program-by-program progress toward effective and efficient delivery of outputs. For example: (1) increase the percent of opportunities available in which NOAA engages, (2) increase the percentage of engagements in which NOAA advice is taken, (3) increase the number of acres restored, stream-miles made available, and damage cases resolved, and (4) reduce the average cost of successful engagements, acres restored, stream-miles made available, and damage cases resolved.
- Fashion these measures as needed to “drive the program,” to help prioritize activities, improve overall program effectiveness and efficiency, and tell the program’s story effectively outside internal management circles.
- Work with partners increasingly to:
 - Get the new measures accepted and collected across related programs
 - Help to build multi-party, real-time performance reporting networks that originate with on-the-ground implementation parties
- Improve the data coming from NOAA Regional Offices, so they will support performance measures better.
- Present the individual measures in a “dashboard” format, similar to those being used now in EPA’s Chesapeake Bay Program, to improve their understandability and usefulness for policy-making, for making management decisions, and for communicating with program stakeholders and the general public.
- **Long Term Goal**—Measure progress toward achieving established habitat improvement goals required to reach related fish population (and other) goals.
 - This measure could be applied, initially, to Habitat conditions in specified high priority geographic areas or domains, and eventually to a broader range of areas—as funding might allow in the future.
 - It could be used to roll-up into national trends for habitat-condition improvements in various types of fish habitats.
 - However, this long-term initiative would likely take a significant amount of new money—such as recommended recently by the National Fish Habitat Action Plan. The financing to enable this initiative would likely need to be provided by a variety of sources—including NOAA’s various research budgets—rather than in the budgets of Habitat Matrix Programs, which are far too small to bear this burden. It should not come out of the current operating budgets of programs in the Habitat Matrix Program. Additional funding to meet this need also might be found in the budgets of other federal agencies, as well as in the budgets of state and local governments that have similar program responsibilities.

APPENDIX A PANEL AND STAFF

PANEL

F. Stevens Redburn,* *Chair*—Consultant, National Academy of Public Administration. Former Chief, Housing Branch, U.S. Office of Management and Budget; Economist, Special Studies, U.S. Office of Management and Budget; Program Analyst, Office of Policy Development and Research, U.S. Department of Housing and Urban Development; Director, Center for Urban Studies, Youngstown State University.

Daniel Fiorino*—Director, Performance Incentives Division, Office of Policy, Economics and Innovation, U.S. Environmental Protection Agency. Former positions with U.S. Environmental Protection Agency: Director, Waste and Chemical Policy Division; Associate Director, Office of Policy Analysis; Senior Policy Advisor to the Assistant Administrator for Policy, Planning, and Evaluation; Director, Information and Regulatory Systems Division; Chief, Regulation Management Staff, Standards and Regulations Division; Analyst Regulatory Reform Staff, Standards and Regulations Divisions.

Jeffery R. Benoit—President, Restore America's Estuaries. Former Director, NOAA Ocean Service, Office of Coastal and Resource Management. Mr. Benoit brings extensive knowledge and experience with NOAA coastal enterprise activities and a variety of issues including habitat.

Emily Woglom—Senior Marine Policy Advisor, The Nature Conservancy. Former Office of Management and Budget examiner for the habitat program. Ms. Woglom brings extensive knowledge of the NOAA coastal and habitat enterprise as well as important linkages to TNC. In addition, she brings extensive knowledge and experience with OMB's Program Assessment Rating Tool.

PROJECT STAFF

J. William Gadsby,* *Senior Advisor*—Former positions with National Academy of Public Administration: Vice President for Academy Studies; Director, Management Studies Program. Former positions with U.S. General Accounting Office: Senior Executive Service; Director, Government Business Operations Issues; Director, Federal Management Issues; Director, Intergovernmental and Management Issues. Former Assistant Director, Financial Management Branch, U.S. Office of Management and Budget.

Bruce D. McDowell,* *Project Director*—President, Intergovernmental Management Associates. Former positions with U.S. Advisory Commission on Intergovernmental Relations: Director of Government Policy Research; Executive Assistant to the Executive Director. Former Director, Governmental Studies, National Council on Public Works Improvement. Former positions with

* *Academy Fellow*

the Metropolitan Washington Council of Governments: Director, Regional Management Information Service; Assistant Director, Regional Planning; Director, Program Coordination. Former Senior Planner, Maryland National Capital Park and Planning Commission.

Jonathan Tucker—*Senior Research Analyst*, Academy Studies, National Academy of Public Administration. Former positions include: Analyst, Technology Partnership Practice, Battelle Memorial Institute; Intern, Committee on Science, Engineering and Public Policy, National Academies; Program Analyst, Advanced Technology Program, National Institute of Standards and Technology; Analyst, Office of Policy and Research, New York State Department of Economic Development (now part of Empire State Development).

Anna Tkachenko—*Research Associate*. Former positions include Research Assistant, Public and International Affairs, George Mason University; Graduate Intern, Human Resources, Development Alternatives, Inc.; Resource Coordinator, The Nature Conservancy; Intern, U.S. Senate Committee on the Judiciary; Intern, Speaker of the House Office, Pennsylvania House of Representatives; Office Manager, Volgograd Regional Civil Court, Volgograd, Russia. Master of Public Administration, George Mason University; Bachelors of Arts in Political Science, Mansfield University of Pennsylvania.

Dawn Fratin, *Senior Analyst*—MPA, Maxwell School of Syracuse University. Former Evaluator, Office of Inspector General, Department of Interior; Program Analyst, Department of Health and Human Services; Peace Corps Volunteer, Malawi, Africa.

Martha S. Ditmeyer—*Senior Administrative Specialist*. Staff for a wide range of Academy studies. Former staff positions at the Massachusetts Institute of Technology and the Communication Satellite Corporation.

APPENDIX B

PRIOR EVALUATIONS OF HABITAT-RELATED PROGRAMS

Broad Habitat Programs

Coastal Zone Management: Measuring Program's Effectiveness Continues to Be a Challenge (GAO, September 2008)

NOAA's CZM Program encourages the nation's 34 states and territories having coast lines (including the Great Lakes) to develop programs to manage and balance economic development with coastal protection. Habitat is one of six issue areas that the states and territories are encouraged to consider. The means of encouragement offered are grants to states, which in turn may make grants to regional and local organizations.

GAO found that the program is operating in compliance with the law, but is limited in its ability to determine the program's effectiveness. A new performance measures system is being installed—which includes habitat-related measures—but it lacks measurable targets and cannot be integrated across states to provide information to assess progress of the program at the national level.

Programmatic Evaluation of the Fish and Wildlife Service Fisheries Program (FY 2004) (Sport Fishing and Boating Partnership Council, 2005)

- This was an independent external evaluation prepared in anticipation of an OMB PART review (similar to the Academy review of NOAA's Habitat Matrix Program).
- The FWS Fisheries Program is similar to the NOAA Habitat Matrix Program in being a collection of nine separate programs; and three of the FWS nine programs have purposes that are very similar to programs in the NOAA Matrix:
 1. Aquatic Habitat Conservation and Management (NOAA EFH)
 2. Mitigation Fisheries (NOAA Habitat Restoration)
 3. Aquatic Nuisance Species (NOAA Aquatic Invasive Species)
- The FWS evaluation was prepared by a 15-person peer-review group.
- The FWS peer-review group awarded qualitative ratings to the nine components (two of which were split into multiple sections). This resulted in 12 ratings for Program components, plus one overall rating of "effective." The 12 component ratings included one "highly effective," six "effective," and five "partially effective." These ratings were based on 22 peer-group meetings and field visits conducted over an 18-month period. The group also made 23 recommendations to improve effectiveness of the program.
- The peer-review group noted two special activities already underway that it believed would lead to future improvements in program effectiveness (even though they were not providing any immediate help when the evaluation was being conducted):

- FWS leadership in developing the National Interagency Fish Habitat Initiative
- Development of the Fisheries Information System (FIS) within FWS
- Recommendations of particular relevance to NOAA’s Habitat Matrix Program include:
 - Establish formal and regular processes for consultation with program partners and stakeholders.
 - Issue annual accomplishments reports and use targeted communications tools.
 - Conduct needs assessments as a basis for prioritizing activities and for establishing program goals and performance targets.
 - Prepare mitigation plans to restore fisheries damaged by federal agency water resources projects (and bill those agencies for the planning and implementation costs).
 - Develop a risk-based assessment process for prioritizing and funding aquatic nuisance species. (FWS already has a priority list of ANS species for each of its nine regions, but it was not risk-based).
 - The FWS evaluation report concludes with the following six messages that arose consistently in assessing the various elements of this multi-part program:
 1. Where agency policy calls for plans, have plans.
 2. Take strategic approach—set priorities and follow them.
 3. Monitor and evaluate program activities on an ongoing basis.
 4. Develop consistent data and definitions (nomenclature and species list, denominator, mitigation expenses).
 5. Undertake a consistent approach to stakeholder/partner involvement, and communications.
 6. Develop one set of evaluation metrics (combine PART, GPRA, Strategic Plan, etc.) and be accountable to them.
- The subsequent PART review of this program by OMB in 2006 also found this program to be “effective” (<http://www.whitehouse.gov/omb/expectmore/summary/10003733.2006.html>). Nevertheless, OMB’s review found that the program needed: (1) a clearer explanation of the relationship between annual goals and long-term goals, (2) a more performance-based budget process, (3) better results in acquiring reimbursements from federal water development agencies for hatchery operations and maintenance associated with federal water projects, and (4) legislative flexibility to open, close, and consolidate hatcheries and to obtain full reimbursement of services necessary to fully realize the program purpose and goals.
- The related FWS Habitat Conservation Program also received a PART review in 2006, but it got a lower rating of “adequate” (<http://www.whitehouse.gov/omb/expectmore/summary/10003734.2006.html>). It was found to Need: (1) an evaluation process to capture information on the entire program,

(2) a schematic and explanation of the relationship between its specific annual output measures and its recently established long-term measures, and (3) a more performance-driven budget.

Evaluation of the Chesapeake Bay Small Watershed Grants Program
(GHK Consulting, Inc., with ZOO-LOGK LLC, August 2007)

- This small program was begun by the EPA in 1998. It now also administers funds provided by NOAA, the U.S. Forest Service, NRCS, the U.S. FWS, Interior's Office of Surface Mining, and private sponsors.
- From 2000 through 2007, about \$16.9 million was provided to support 507 projects (that leveraged another \$50.7 million).
- The purpose is to mobilize citizens, volunteers, and small community-based organizations to implement technically sound conservation and restoration projects—such as stream financing, stream bank stabilization, wetland restoration, riparian buffer plantings, storm water management practices, and farmland conservation practices.
- These grants can cover planning, capacity-building, and implementation activities. Most grants are small (around \$50,000).
- But some are larger and some are renewed year-to-year.
- About 60% of the implementation investments appear likely to be sustained, returning benefits over a long period of time.
- The evaluation report makes five recommendations to further improve the effectiveness of this program:
 1. Expand funding for capacity-building—including social marketing, building strong and persistent local community groups, supporting stronger local regulations, networking local and regional groups, and developing more local role models, mentors, and coordinators.
 2. Fund planning to help bring all stakeholders into collaborative action to implement technically sound conservation and restoration practices.
 3. Restructure the grants to emphasize implementation activities.
 4. Further streamline the grant administration and progress reporting process.
 5. Adopt a program-wide monitoring process to measure precisely the water pollution and habitat improvements being achieved by the program.

EPA Chesapeake Bay Program PART Review
(OMB, 2006)

This program is a multipurpose estuary protection and restoration effort that has been operating since 1983. NOAA participates in it. It is a combination of direct federal activities, federal block and formula grants, and competitive federal grants.

OMB's review of this program resulted in an assessment score of "moderately effective," meaning that it needed improvement. The primary areas needing improvement were identified by OMB as:

- Lack of a performance budget that ties funding requests to performance targets
- No evidence of a clear operating plan, an obligation schedule, and a limited amount of unobligated funds at the end of the year
- Inadequate tracking of program obligations
- Lack of efficiency measures to track and demonstrate annually improving efficiency or cost-effectiveness of operations

As a result of this review, an improvement plan was begun to:

- Establish a method of better characterizing the uncertainties involved in achieving program goals and targets
- Develop a comprehensive implementation strategy and plan that can more adequately coordinate the activities of multiple program partners and account for available funds
- Promote and track the most cost-effective restoration activities

Scientific and Technical Needs for Fulfilling Chesapeake 2000 Goals

(Scientific and Technical Advisory Committee (STAC) of the Chesapeake Bay Program, 2004 Update)

This STAC report provides recommendations for strengthening the scientific basis for implementing the actions necessary to achieve the Program's adopted goals. Among the Habitat issues addressed are oyster reef construction, exotic/invasive species protections, fish-habitat relations, SAV/wetland preservation and restoration, and watershed and estuarine monitoring. This information is important to the success of implementation programs, and it is updated periodically.

Habitat Protection Programs

Fishery Management: Problems Remain with National Marine Fisheries Service's Implementation of the Magnuson-Stevens Act (GAO, April 2000)

This report was requested by congressional committees to assess NMFS' compliance with the following three provisions of the Magnuson-Stevens Act:

- Use the best available scientific information for fishery management
- Take into account the economic importance of fishery resources to fishing communities as it adopts measures to manage fishery resources

- Identify essential fish habitat, the adverse impacts on that habitat, and the actions needed to conserve and enhance that habitat and also develop a consultation process designed to protect that habitat from adverse impacts

GAO concluded that NMFS is technically meeting these three requirements of the act but could do a better job. GAO recommended improving:

- Data collection efforts
- Communications with the fishing industry
- Economic analysis of community impacts that would provide alternatives to minimize adverse impacts
- Estimates of the costs associated with conserving and enhancing fish habitats

Ray of Hope: Successes and Shortcomings in Protecting EFH
(Marine Fish Conservation Network, 2006)

- Focused mainly on damage done to EFH by fishing gear
- One region (South Atlantic) doing exemplary job of protection
- Other regions not doing so well (significant shortfalls)
- Primary tools: insert Habitat Protections into Fishery Management Plans, based on EIS analysis

Body of Evidence: The Fragile State of America's Oceans-A Review of Recent Science and a Framework for Recovery (The Marine Fish Conservation Network, 2003)

- In assessing the rapidly declining status of ocean fish populations, this report includes a serious and persistent concern about habitat destruction caused by many types of industrial fishing gear—as an important part of “the issue of ocean health.”
- “Federal fisheries managers have not delivered on the commitment to a new path of managing fisheries as called for by the SFA (Sustainable Fisheries Act of 1996). Regional management councils have often avoided following ... the SFA ... and measures that would ... protect essential fish habitat.” NOAA Fisheries, in turn, has approved fishery management plans that do not meet the mandates of the SFA ... on the rare occasions that federal managers have fully implemented the SFA, there have been encouraging results. It is not true, however, that these few examples are evidence that the goals of the SFA have been met ... The question upon which the future depends is not whether there are examples of good management, but whether good management is the norm ... this is not the case ... The Pew Oceans Commission ... called for broad reforms of federal fish management to ensure protection of ecosystems and habitats and ... as the evidence piles up, the case could not be more clear ... we must act boldly, decisively, innovatively, and quickly.”
- Recommendations for reform include:

- Recognize that protecting healthy habitats is essential to maintaining fish populations.
- Ecosystem-based management is supported broadly by fisheries researchers.
- Fishery management decisions should be based on ecological and biological factors, not only on socioeconomic considerations. When socioeconomic considerations supersede ecological decisions, everyone loses.
- Reform of SFA is needed to institutionalize sustainable, science-based marine ecosystem management, establish a different structure of decision-making, and achieve implementation of the Act's principles of sound fisheries management.

Evaluation of the United States Essential Fish Habitat Consultation Process: Final Report
(Geo-Marine, Inc., November 2008)

This report, prepared for the NMFS Office of Habitat Conservation, notes the lack of binding effect of its EFH consultation recommendations. This condition has existed from the initial enactment of the Magnuson-Stevens Act. And the conditions of EFH have consistently grown worse over that whole time. Therefore, the report calls for strengthening the effect of EFH consultations. A series of ten recommendations are offered, including one to amend the Act to make EFH consultation recommendations binding. Short of that, the other recommendations would take practical steps to strengthen the existing process administratively. One, for example, would combine the FEH consultation document with the Endangered Species document.

Hydropower Relicensing: Federal Costs are not being Recovered
(GAO, June 2000)

- The Federal Power Act authorizes recovery of Federal agency costs incurred in the relicensing process.
- Many of these costs are not being recovered.
- Reasons include:
 - No clear guidance on which costs can be recovered and how to do it
 - No IT system to make reimbursement requests easy to do.
 - No benefit to an agency to do this; recovered funds reduce the agency's appropriation or go to the Treasury's general fund.
- GAO recommends recovering more, but does not believe it will happen.
- NMFS did not have any system for keeping track of its Hydropower Program costs.

Potential for Introduction of Invasive Species into Louisiana from Illinois River Dredged Material (U.S. Army Corps of Engineers, June 2008)

- Rebuilding the Louisiana coast requires new materials transported from remote locations.
- Some such materials are dredged sediments from the Illinois River.

- The imported materials and the transport vehicles are potential sources of new invasive species.
- Three species—two plants and one form of algae—are of concern.
- Recommendations to guard against potential invasions from this source are:
 - Pre-project species survey
 - Seed bank study
 - Early warning rapid response plan
 - Site monitoring
 - A safer but more expensive transport option

Invasive Species (GAO, 2001, 2002, 2003, 2005)

Under this general title, GAO issued five reports or testimonies in a five-year period. The sub-titles of them are:

- Obstacles Hinder Federal Rapid Response to Growing Threat
- Clearer Focus and Greater Commitment Needed to Effectively Manage the Problem
- Federal Efforts and State Perspectives on Challenges and National Leadership (Testimony)
- Progress and Challenges in Preventing Introduction into U.S. Waters Via the Ballast Water in Ships (Report and also Testimony)

Clearly, Congress is concerned with this problem, and it began funding it with earmarks even before it became part of NOAA’s budget request. Nevertheless, the NOAA program responsible for it, which is now mostly in the regular budget, remains small.

Responsibilities for this program are divided among several federal agencies. Although a National Invasive Species Council has been established and a National Management Plan has been established, GAO found in 2003 that implementation progress had been slow, and priorities were low. GAO’s 2005 testimony on the ballast water problem found that many loopholes existed in the laws and this remained a serious source of new introductions of invasive species.

Great Lakes Shipping, Trade, and Aquatic Invasive Species: Special Report 291
(The National Academies, 2008)

The committee convened to address this issue found that continued introduction of invasive species into the Great Lakes by ocean going vessels remains a significant problem. However, eliminating it would be virtually impossible without banning all ocean going vessels. Therefore, the committee recommended four urgent actions that would help to moderate the risk:

- Require all ocean going ships, even those only operating in coastal waters, to take the protective measures now required of trans-Atlantic vessels

- The United States should follow Canada’s lead in adopting International standards for ballast water exchange and performance standards
- Establish a bi-national science-based surveillance program to spot new introductions, leveraging existing monitoring activities wherever possible.
- Establish an independent adaptive process, free of conflicts of interest, to ensure timely updating of new prevention measures.

Habitat Restoration Programs

Coastal Wetlands: Lessons Learned from Past Efforts in Louisiana Could Help Guide Future Restoration and Protection (GAO, December 2007)

- Program established in 1990 (CWPPRA)
- 147 projects; \$1.78 billion over first 17 years
- CWPPRA has not implemented a comprehensive evaluation and monitoring approach; cannot determine the collective success of contracted projects.
- Lessons learned:
 - Maintain the collaborative process across disciplines and agencies that makes projects possible.
 - Increasing costs are putting more projects on hold while they await adequate funds.
 - Lack of completing an integrated monitoring system (under development since 2003) delays ability to determine whether goals and objectives are being met.
 - Resolving landowner issues delays projects and makes them more expensive.
 - Some projects have failed, sometimes because problems were not anticipated or could not be resolved.
 - Storms and hurricanes cause significant setbacks.
 - A better implementation strategy is needed to address such uncertainties and difficulties.

Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu-Fee Mitigation (GAO, May 2001)

Wetlands perform many valuable functions. Among those functions is providing habitat for fish and wildlife. National policy protects wetlands from destruction or degradation. In cases where such destruction or degradation is necessary, the wetland is to be replaced in another location. Several means are provided by federal law. One of those means is for the developer causing the damage to pay a fee for use by others to provide the replacement. NOAA works with and advises the Corps of Engineers, EPA, and the U.S. FWS on running the program, and the use of the fee-based option has increased over the last decade. The effectiveness of this replacement fee program is the subject of this GAO evaluation.

GAO found that “The extent to which the in-lieu-fee option has achieved its purpose of mitigating adverse impacts to wetlands is uncertain.” Records on replacement acres are not always available, and there is no agreement on how to measure functional equivalents to the acres lost. GAO recommends that criteria for measuring functional equivalence should be devised, and EPA should take the lead in this rather than the Corps.

Pacific Salmon Recovery Fund: Program Evaluation

(Ross & Associates Environmental Consulting, Ltd., April 18, 2006)

- This evaluation was prepared six years after the program began. Significant elements in this program include habitat maintenance and improvement; research, monitoring, and evaluation; ecosystem planning; and stewardship—all of which are also significant elements in the Habitat Matrix program—but the primary outcome for the salmon program is very clearly improved salmon populations.
- The evaluation found that data were available only for summaries of discrete activities and outputs. There was no framework for linking current activities to the program’s long-term outcome, and no effort underway to develop such a framework or an outcome evaluation methodology. Consequently, the evaluation found no means of prioritizing activities and annual investments.
- The primary recommendation was to develop an outcome-oriented research, monitoring, and evaluation framework (building on the program’s database already under development) to enable impact analysis of program activities capable of linking activity outputs to the desired outcome and thereby providing a means to more effectively prioritize annual activities and investments. The report provides step-by-step recommendations to support this transformation in each of the eight geographic Pacific salmon coastal recovery domains—around which the program centers.

Dam Removal: A New Option for a New Century (The Aspen Institute, 2002)

Tens of thousands of dams exist all across the nation from New England to California. They range in size from small mill dams to large multipurpose dams. Many are old, no longer being used for their intended purposes, and present safety problems. And, it is now widely recognized that many of these dams may be more of a liability than an asset. However, dam removal has seldom been considered until recently.

The Aspen Institute convened a group of 26 experts in every aspect of dams to meet in a series of eight meetings over two years to consider this situation. The group concluded that dam removal should be an option considered in addressing problems related to dams and rivers. And they went further to develop a new multidimensional way of thinking about this problem. As a result, the group presented a series of practical recommendations and advice for addressing the problem—including inventories and reviews of all dams, appropriate to their scale and importance. The report, which was partially funded by NOAA, also provides a long list of lessons learned in implementing dam removal projects.

NOAA's Habitat Matrix Program now includes an Open Rivers Initiative within its Habitat Restoration Program, as well as its long-standing Hydropower relicensing program. Both programs may be able to benefit from this report.

Tackling Marine Debris in the 21st Century (The National Academies, 2008)

Regulation of marine debris falls largely under an international convention known as MARPOL Annex V, which became effective in 1988. In the U.S., this convention is implemented through the Act to Prevent Pollution from Ships. But now, 20 years later, large quantities of plastic and other marine debris are in the water.

In 2006, Congress enacted the Marine Debris Research, Prevention, and Reduction Act, which brings in several domestic agencies to work on the problem—including NOAA—and established an Interagency Marine Debris Coordinating Committee. That act also called on the Academies to prepare this report.

Among its recommendations, the Academies report calls on Congress or the Interagency Committee to clearly designate a lead agency, asks the U.S. Coast Guard to promulgate best management practices, suggests adopting a goal of zero discharge of marine debris into the marine environment, and calls for development of a national strategic plan with performance measures. In addition, Congress should add marine debris standards to the Magnuson Act, and NOAA should convene a workshop to explore innovative and cost-effective approaches to addressing this problem in the U.S. fishing fleet. The report also recommends that the Interagency Committee support the establishment of scalable and statistically rigorous protocols for monitoring at a variety of scales and metrics to allow assessment of progress in marine debris mitigation.

Habitat Stewardship Programs

An Evaluation of NOAA Chesapeake Bay Watershed Education and Training Program Meaningful Watershed Education Experiences (eeEvaluations, February 2007)

NOAA's Chesapeake Bay Office has been providing teacher training and student education about the Bay for several years. The long-term objective is to provide a meaningful watershed educational experience (MWEE) to every student in the Bay Watershed before they graduate from high school. This program is sometimes described as "no student left inside." It gets them outside for a real hands-on acquaintance with the Bay and its environs. The thought, of course, is that this experience will make both the teachers and students better stewards of the natural environment. The program's acronym is B-WET.

This evaluation was conducted through questionnaire surveys of about 500 teachers and 640 students, plus 1000 student-completed standardized state science tests. In addition, 13 program managers were interviewed.

The results showed (in brief) that:

- Teachers had greater confidence and ability to provide students with MWEE than they had before joining the program, and actually did increase this activity in their curriculums.
- Teachers reported the professional development practices that were most positively related to increasing their confidence and ability to teach this new material, as well as the factors that limited their ability to carry through. Having sufficient information and time to practice were important on the positive side, while limitations included insufficient flexibility in their curriculum as well as insufficient time and funds during the school year to engage in this activity and to collaborate with other teachers who are active in the program.

Recommendations to improve teacher performance in this program included:

- Continuation of the NOAA program, with priority given to multi-day activities
- More specific guidance to teachers, including sample lesson plans
- More time to allow teachers to collaborate with each other and to partner in the outdoor teaching experiences
- Greater mentoring by experienced teachers in their school
- Greater financial and other support for classroom and field exercises
- Efforts to get local school districts to revise their standards to include MWEE

Student results showed that:

- Students learned better when they were learning things that they considered important to them, were doing hands-on activities, were involved in collecting and analyzing data, and were outdoors
- Students' sense of responsibility for the environment was higher when they felt they could make a difference

Recommendations for improving student learning and achievement included:

- More work by teachers to determine what is most important to students to make the MWEE most relevant
- Incorporate hands-on outdoor experiences and make sure they are positive and leave the students with a sense of having been empowered to make a difference
- Provide time for students to reflect on what they have learned
- Expand the program to include more students

More work is needed to establish a link between this program and student achievement on general science tests. This limited evaluation of that goal was inconclusive.

Human Dimensions: A Pilot Research Project Exploring Volunteerism and Conservation Behavior (The Environmental PR Group, 2006)

This evaluation of volunteerism was commissioned by Restore America's Estuaries and NOAA. Its goal was to begin exploring whether volunteering on environmental projects results in other conservation behaviors outside the specific volunteer project. The volunteers selected to be evaluated were working with projects of Tampa Bay Watch, Save San Francisco Bay, and Galveston Bay Foundation.

Results of this research showed:

- Most respondents have strongly pro-environmental attitudes and behaviors, and fairly low barriers to participating in environmental activities.
- Respondents clearly valued helping the environment for its own sake, not for any personal gain.
- 61% of respondents reported having recreated in or near the Bay in the past year, even though they lived on average about 36 miles away. They also regularly perform other environmental acts very often—such as refraining from littering, adhering to fishing, boating, and hunting laws. However, few of them participate in public environmental meetings or drive hybrid or other fuel-efficient cars.
- Most of the respondents (82%) did not actually belong to the Bay organization sponsoring the activity they volunteered for, and about half (51%) volunteered for other volunteer efforts.
- Respondents that did belong to an environmental group were much more likely to contribute money and do not believe that volunteering costs them too much. Non-members had more trouble finding environmental information and knowing how to act in a pro-environmental way.
- Respondents who did contribute money were more likely to believe that coastal environments are not capable of restoring themselves from the impacts of modern society, and that the effects of human interference with the coastal environment can have disastrous results. They also recycle newspapers/cans/bottles, and volunteer in public meetings on environmental issues.

Appendix C

Project Contact List

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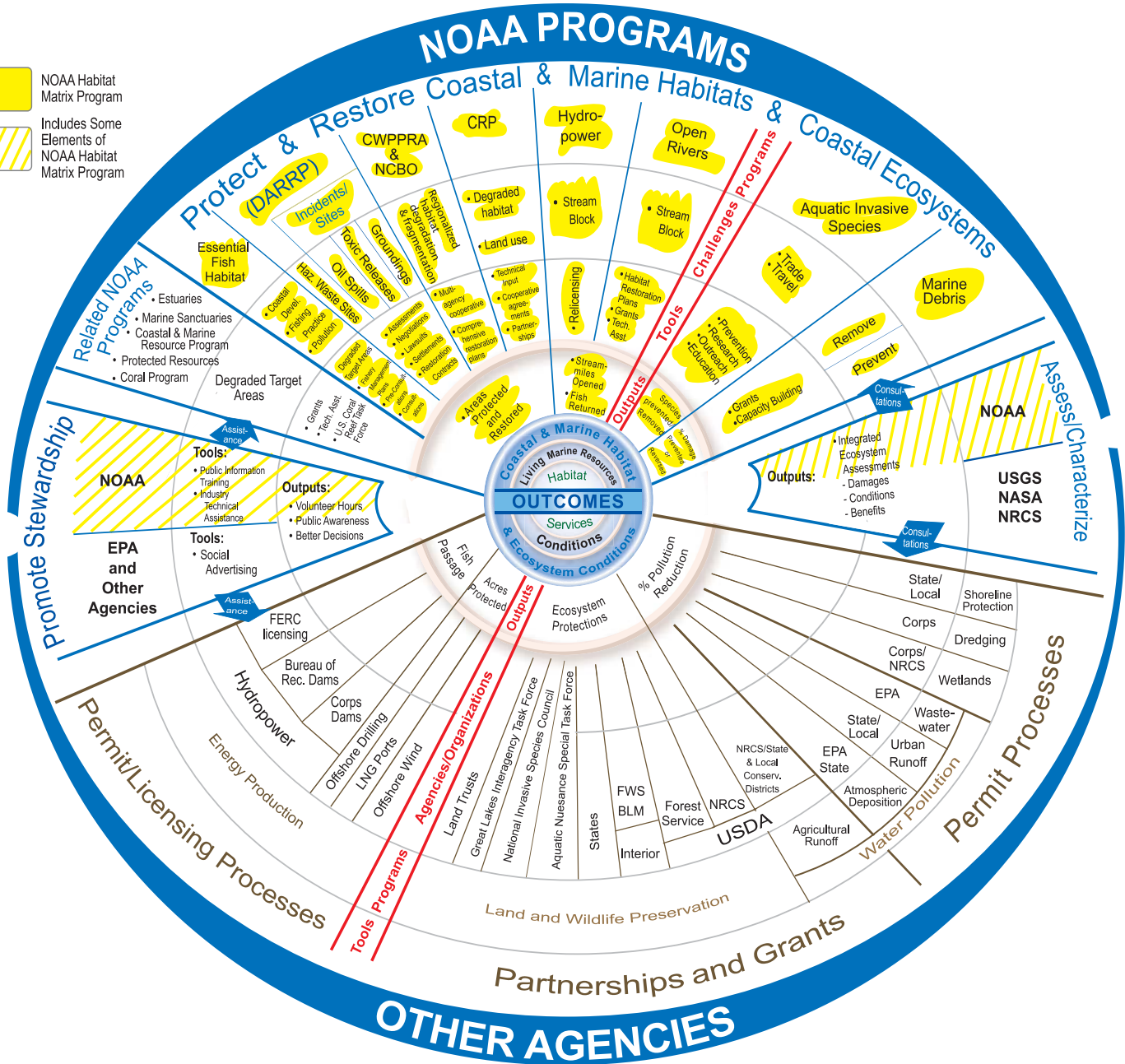
Background photo: National Oceanic and Atmospheric Administration/Department of Commerce. Healthy seagrass with a barracuda from NOAA's Sanctuaries Collection. Location: Florida Keys National Marine Sanctuary. Photographer: Heather Dine.

Left to right, top to bottom

1. Opening tidal channel in Texas—NOAA National Marine Fisheries Service, Office of Habitat Conservation, Bahia Grande Estuary, Texas.
2. Lion fish—Center for Fisheries and Habitat Research, Beaufort, North Carolina.
3. Deep sea corals—NOAA, National Marine Fisheries Service, Office of Habitat Conservation.
4. Using Sonar to map river bottoms—NOAA, National Marine Fisheries Service, Office of Habitat Conservation, Chesapeake Bay Office (Photographer: David Harp/Chesapeakephotos.com).
5. Marine debris removal in Hawaii—NOAA, National Marine Fisheries Service, Office of Habitat Conservation, the Pacific Islands Region, Hawaii.
6. Marmot Dam (Oregon) removal—NOAA, National Marine Fisheries Service, FERC, Portland, Oregon.
7. Sand dunes preservation—Photo courtesy of USDA Natural Resources Conservation Service.

NOAA HABITAT MATRIX PROGRAM—IN CONTEXT

-  NOAA Habitat Matrix Program
-  Includes Some Elements of NOAA Habitat Matrix Program



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