EVALUATION FINDINGS

FOR THE

CHESAPEAKE BAY-MARYLAND NATIONAL ESTUARINE RESEARCH RESERVE

DECEMBER 2002 THROUGH NOVEMBER 2005

FINAL – May 2006

Office of Ocean and Coastal Resource Management
National Ocean Service
National Oceanic and Atmospheric Administration
United States Department of Commerce

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I. INTRODUCTION

The Coastal Zone Management Act (CZMA) of 1972, as amended, established the National Estuarine Research Reserve System (NERRS), a network of reserves that are protected for long-term research, environmental monitoring, education, and coastal stewardship. Sections 312 and 315 of the CZMA require NOAA's Office of Ocean and Coastal Resource Management (OCRM) to conduct periodic performance reviews or evaluations of federally designated national estuarine research reserves (NERRs). This document describes the evaluation findings of the Director of NOAA's OCRM with respect to the operation and management of the Chesapeake Bay-Maryland National Estuarine Research Reserve (Chesapeake Bay-MD NERR, Maryland Reserve, or Reserve) by the Maryland Department of Natural Resources (DNR) during the period of December 2002 through November 2005. It contains a description of the review procedures, a description of the program, evaluation findings, major accomplishments during the review period, recommendations, a conclusion, and appendices.

The recommendations made by this evaluation appear in **bold** type and follow the section of the findings in which the facts relevant to the recommendation are discussed. The recommendations may be of two types:

> **Necessary Actions** address programmatic requirements and must be carried out by the date(s) specified;
>
> **Program Suggestions** describe actions that OCRM believes would improve the program, but which are not mandatory at this time. If no dates are indicated, the State is expected to have considered these Program Suggestions by the time of the next CZMA §312 evaluation.

Failure to address Necessary Actions may result in a future finding of non-adherence and the invoking of interim sanctions, as specified in CZMA §312(c). Program Suggestions that must be reiterated in consecutive evaluations to address continuing problems may be elevated to Necessary Actions. NOAA will consider the findings in this evaluation document in making future financial award decisions relative to the Chesapeake Bay-MD NERR.

It is the conclusion of this evaluation that the Chesapeake Bay-MD NERR has implemented and enforced its federally approved program and adhered to its programmatic obligations defined by the terms of federal financial assistance awards and NERR System regulations under Section 315 of the CZMA during most of the period covered by this evaluation. However, OCRM is concerned about the effect of events and decisions on the Reserve during this evaluation time period and about whether the Chesapeake Bay-MD NERR will be able to continue to implement and enforce the federally approved program and adhere to programmatic obligations. The Reserve must hire an Education Coordinator and must complete revisions to its management plan by dates established in two Necessary Actions. If the Reserve

fails to do so, NOAA will immediately initiate a problem-specific evaluation to address the issue(s). Upon completion of this focused evaluation, the State of Maryland's operation and management of the Chesapeake Bay-MD NERR may be found to be deficient and the State of Maryland may be found not adhering to the requirements of NERRS regulations as adopted by the Secretary of Commerce under the CZMA. This document contains two (2) recommendations that take the form of Necessary Actions that are mandatory and must be completed by the identified deadline, and seven (7) Program Suggestions that denote actions OCRM believes the State should take to improve the program, but which are not mandatory at this time.

II. REVIEW PROCEDURES

A. OVERVIEW

The Office of Ocean and Coastal Resource Management (OCRM) evaluation staff began its review of the Chesapeake Bay-MD NERR in September 2005. The §312 evaluation process involves four distinct components:

- An initial document review and identification of specific issues of concern;
- A site visit to Maryland, including interviews and public meetings;
- Development of draft evaluation findings; and
- Preparation of the final evaluation findings, partly based on comments from the State regarding the content and timetables of necessary actions specified in the draft document.

B. DOCUMENT REVIEW AND ISSUE DEVELOPMENT

The evaluation team reviewed a wide variety of documents prior to the site visit, including:

- The Chesapeake Bay-MD NERR federally-approved Environmental Impact Statement, management plan, and program documents;
- Financial assistance awards, performance reports, and work products;
- Official correspondence between the program and OCRM;
- The previous §312 evaluation findings and the state's response to the recommendations (see Appendix A); and
- Other relevant information.

Based on this review and on discussions with the OCRM Estuarine Reserves Division staff, the evaluation team identified the following priority issues:

- Major accomplishments during the review period;
- Status of reserve staffing and needs;
- Facilities development;
- Status of general administration of the reserve and management plan revisions;
- Status of implementation of the reserve's research, monitoring, and education programs;
- The manner in which the reserve coordinates with other governmental and non-governmental organizations and programs in the state and region; and
- The reserve's progress in addressing the recommendations contained in the most recent Section 312 findings dated February 2004. Appendix A contains the program's responses to those recommendations.

C. SITE VISIT TO MARYLAND

Notification of the scheduled evaluation was sent to the Maryland Department of Natural Resources (DNR), the Chesapeake Bay-MD NERR, relevant federal agencies, and the Maryland congressional delegation. The Chesapeake Bay-MD NERR published notification of the evaluation and scheduled public meeting. In addition, a notice of NOAA's "Intent to Evaluate" was published in the *Federal Register* on September 28, 2005.

The site visit to Maryland was conducted from November 14-16, 2005. The evaluation team consisted of L. Christine McCay, Evaluation Team Leader, OCRM National Policy and Evaluation Division; Cory Riley, Program Specialist, OCRM Estuarine Reserves Division; Regina Spallone, OCRM National Policy and Evaluation Division; and Peter Wellenberger, Manager, Great Bay (New Hampshire) National Estuarine Research Reserve.

During the site visit, the evaluation team met with Chesapeake Bay-MD NERR staff, senior DNR and Division of Coastal Management staff, other state officials, coastal researchers and academicians, local advisory committee members, civic group representatives, local government officials, and non-governmental organizations. Appendix B contains a listing of individuals contacted during this review.

As required by the CZMA, a public meeting was held on Monday, November 14, 2005, at 7:00 p.m. at the Jug Bay Wetlands Sanctuary, 1361 Wrighton Road, Lothian, Maryland. Members of the general public were given the opportunity to express their opinions about the overall operation and management of the Chesapeake Bay-MDNERR. Appendix C lists persons who attended the public meetings.

Written comments were also accepted. Appendix D contains NOAA's responses to written comments received in response to the evaluation.

The Chesapeake Bay-MD NERR and the DNR Coastal Zone Management Division staff were crucial in setting up meetings and arranging logistics for the evaluation site visit. Their support is most gratefully acknowledged.

III. RESERVE PROGRAM DESCRIPTION

A. THE NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM

The Coastal Zone Management Act of 1972, as amended, established a system of National Estuarine Research Reserves that are funded cooperatively by NOAA's Office of Ocean and Coastal Resource Management and the host states or territories, which also manage the reserves. The Reserve Program has two primary missions: (1) to establish and maintain, through federal and state cooperation, a national system of reserves representative of various biogeographic regions in the U.S.; and (2) to conduct long-term research, educational, and interpretive activities in support of national coastal zone management priorities.

Toward those missions, reserve sites are selected to represent the range of biogeographic regions, estuarine types, and coastal management challenges occurring throughout the U.S. To date, NOAA has designated 27 National Estuarine Research Reserves that collectively protect more than one million acres of estuarine land and water. Two additional sites are currently in various stages of the designation process.

B. RESERVE SITE DESCRIPTION

The Chesapeake Bay is the largest estuary in the United States. It lies on the Atlantic Coastal Plain in the Chesapeake Bay Subregion of the Virginian Biogeographic Region, roughly half in the State of Maryland and half in the Commonwealth of Virginia. The Chesapeake Bay is one of the most productive bodies of water in the world and is highly valued for its commercial and recreational resources. However, intense commercial and residential development in the Bay's watershed is endangering these resources. Over 16,000,000 people live in the Chesapeake Bay region today; almost 18,000,000 people are estimated to live in the region in the year 2020 (Chesapeake Bay Program website). This dramatic rise in population, inevitably accompanied by escalating development, threatens Bay resources with increasingly greater and more complex stresses. An understanding of these stresses is critical to sustaining the Bay's productivity.

Maryland's participation in the National Estuarine Research Reserve System is based on the recognition that a reserve offers a unique opportunity to confront Chesapeake Bay environmental programs. As relatively pristine preserved estuarine areas, the Chesapeake Bay Reserve components provide natural outdoor laboratories for studying estuarine ecosystems and the impacts of human-induced stresses. The Reserve and its components also serve to educate the public about the beauty of estuarine wetlands and their value to the Bay's ecology, economy, and history.

The state began the process to designate a NERR in 1974 but discontinued efforts in 1975 after encountering difficulties in selecting a site. In 1980 the effort was restarted, and DNR and NOAA agreed that a multi-site system would best represent Maryland's portion of the

Chesapeake Bay. A search for reserve sites originally produced over 200 candidate components. This list was narrowed down by conducting an evaluation of sites using maps and aerial photographs and by on-site inspection. In 1980 several additions and deletions were made to the old list. In July 1985 DNR and NOAA reached a consensus that Maryland would be represented best by a multi-component reserve system composed of five subregions, and the Reserve was officially designated. However, in 1988 as a result of a series of public meetings held for each Reserve component and with the realization by DNR that a smaller system of sites would be more manageable, DNR proposed a three-site system to NOAA. In January 1989 NOAA endorsed the three-site plan. Under this concept, the Reserve is now composed of the sites of Monie Bay (representing the Lower Middle Bay and designated in 1985); Otter Point Creek (representing the Upper Bay and designated in 1990); and Jug Bay (representing a tributary and designated in 1990).

C. RESERVE ADMINISTRATION

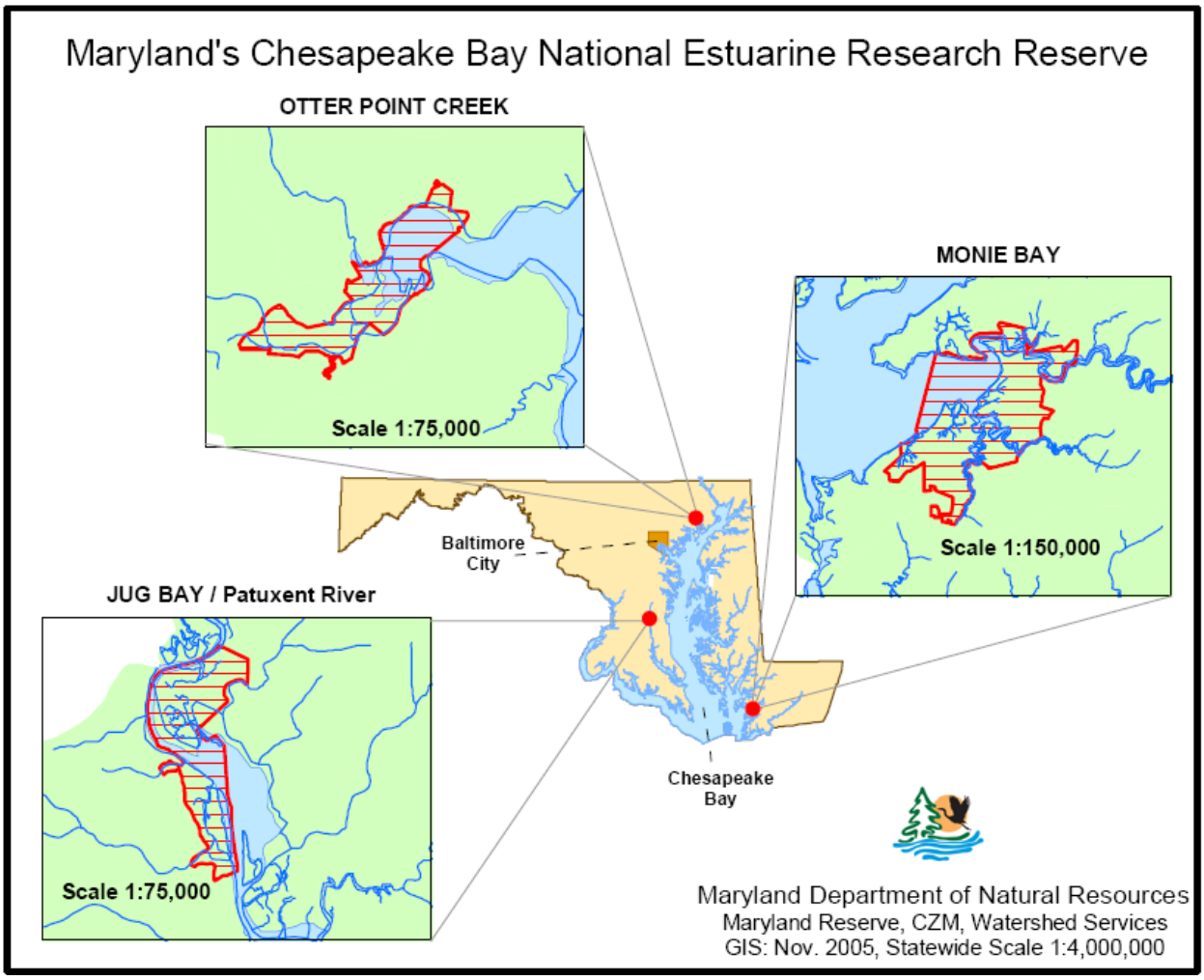
In July 1990 the DNR and NOAA entered into a Memorandum of Understanding regarding the administration of the Reserve. The DNR Chesapeake Bay Programs unit is the lead agency for the Reserve. Currently the Reserve is administratively located in the Coastal Zone Management Division within the Watershed Services Center unit of the Chesapeake Bay Programs. Reserve staff includes an administrative/fiscal assistant, a program manager, research coordinator, stewardship coordinator, and education coordinator, which position was vacant at the time of the site visit and was being considered for elimination as part of DNR's budgetary reduction obligations. The three components have site managers or coordinators who are not employees of the Reserve itself. The Reserve manager is generally responsible for the general NERR systemwide goals and objectives as well as the specific Reserve goals and objectives as defined in the management plan. The research, education, and stewardship coordinators are generally responsible for NERR systemwide activities within their sectors and coordinate activities with Reserve component managers.

Monie Bay, the 3,426-acre southernmost component, is located in Somerset County on the eastern shore of the Lower Middle Bay. The land is owned by the State and managed by DNR's Wildlife and Heritage Service as part of the much larger 13,000-acre Deal Island Wildlife Management Area. At Monie Bay, the DNR Wildlife and Heritage Service area manager and staff are directly responsible for management of the component, although there is no on-site facility to serve as a visitor center or site manager's office. Access for both researchers and the general public is limited for the Reserve component. There is no good access point to or from the water (although there is a small boat ramp approximately 2.5 miles away by water across the open water of Monie Bay), there are almost no roads, and there is no facility to use for educational or stewardship programs and projects. The Reserve staff and the site manager have been able to offer limited educational programs but have depended upon staff and volunteers from the other components to assist. There are volunteers in the area but no organized volunteer friends' group dedicated to Monie Bay. Some research and monitoring efforts are conducted here in addition to educational programs.

Otter Point Creek (approximately 700 acres) is the northernmost Reserve component and is located in Harford County on the western shore of the Upper Bay. Landowners include Harford County and the Izaak Walton League. Conservation easements for the Izaak Walton League property (the Bosely Conservancy) have been donated to the State. Harford County's Leight Park and the Anita C. Leight Estuary Center provide an on-site manager and staff (County employees) and a facility that serves as a visitor and education center. Research, monitoring, education, and stewardship programs and projects are conducted at Otter Point Creek, which is well-served by a strong volunteer friends' group.

The Jug Bay component is situated along both sides of the Patuxent River in Anne Arundel and Prince George's counties. The Anne Arundel County Department of Recreation and Parks manages its county-owned property as the Jug Bay Wetlands Sanctuary (1,400 acres) on the east side of the Patuxent River. The Maryland-National Capital Park and Planning Commission and Prince George's County own and manage the Jug Bay Natural Area (2,000 acres) portion of the larger Patuxent River Park on the west side of the river. Portions of both larger county acreages are designated as the 722-acre Jug Bay component of the Reserve. Both the Jug Bay Wetlands Sanctuary and the Patuxent River Park have on-site managers and staffs (County employees) and separate visitor centers. The Patuxent River Park allows passive recreational activities; the Park and the Reserve staff conduct interpretive programs, educational, research, monitoring, and stewardship activities. The Jug Bay Wetlands Sanctuary provides ample opportunity for research and monitoring and also conducts educational and stewardship programs and activities. The partnership at the Jug Bay component on both sides of the river provides a good complementary mix of strengths and activities. It is strongly supported by an active regional volunteer friends' group.

The four managers work with the Reserve manager and staff to conduct research, education, and stewardship activities.


Maryland's Chesapeake Bay National Estuarine Research Reserve
OTTER POINT CREEK
Scale 1:75,000
MONIE BAY
Scale 1:150,000
Baltimore City
JUG BAY / Patuxent River
Scale 1:75,000
Chesapeake Bay
Maryland Department of Natural Resources
Maryland Reserve, CZM, Watershed Services
GIS: Nov. 2005, Statewide Scale 1:4,000,000

IV. REVIEW FINDINGS, ACCOMPLISHMENTS, AND RECOMMENDATIONS

A. OPERATIONS AND MANAGEMENT

1. Staffing

The Chesapeake Bay-MD Reserve has the smallest staff of all 27 reserves in the nationwide system. Prior to mid-2004, there were an administrative/fiscal officer and four programmatic positions at the Reserve: manager, education coordinator, research coordinator, and stewardship coordinator. Since then and during the site visit, there are an administrative/fiscal officer and either two or three programmatic positions. Without doubt, these staff members are extremely busy and often find themselves without enough time to complete the work they want and need to accomplish. Nevertheless, the staff of the Reserve is the single most important factor in the successes and achievements that have occurred during this evaluation period. Other agency staff, partners, and volunteers were unanimous in their praise for the dedication, professionalism, knowledge, and willingness to share and cooperate that these staff members have shown, particularly in light of the challenges that are discussed below.

ACCOMPLISHMENT: The staff members of the Reserve are dedicated and highly respected professionals who, despite significant challenges during this evaluation period, are responsible for the achievements and successes as outlined in these findings.

The State of Maryland has had to deal with budget issues during the period covered by this evaluation and identified the elimination of some positions within state agencies as one mechanism to address these issues. As part of the state's budget cutting efforts, the Department of Natural Resources must eliminate approximately 50 positions. This particular effort is the last in a series of budget-cutting/staff position elimination efforts that have taken place during this evaluation period. Whenever there is a resignation of a permanent full-time equivalent (FTE) position, that position is not advertised or filled but is transferred to a departmental "holding location" or "pool" for a later decision about whether to eliminate that position to meet the DNR's position elimination quota. In July 2004 the reserve manager resigned, and that position was lost to the Reserve and DNR Coastal Zone Division. The education coordinator was designated as the acting manager in addition to his other responsibilities. However, the education coordinator resigned in July 2005, and that FTE position was then also lost to the Reserve and Coastal Zone Division (it remained within DNR for a later decision about its elimination). Recognizing that the manager position had to be filled, the DNR Watershed Services Unit transferred a person and permanent FTE position from another section into the Reserve as manager in September 2005. [At the time of issuance of these Final Findings, the new manager has resigned to take another job in Maryland state government, and the manager

position will need to be filled again.]

At the time of the site visit, the education coordinator FTE position was still unfilled and there was uncertainty about whether it would be eliminated. During the site visit, DNR staff informed the evaluation team that staffing and funding decisions for the coming fiscal year would need to be made by DNR sometime in January. Prior to the issuance of draft or final findings, the OCRM sent a letter to the DNR Assistant Secretary for Chesapeake Bay Programs in early January stating OCRM's serious concerns about the ongoing failure to fill the education coordinator position and the possible consequences of such failure. As of the date of these Findings, the Reserve has approval to hire a full-time state-funded education coordinator and a full-time federally-funded long-term contractual position for the CTP coordinator. The education coordinator position has been advertised. While this process continues to take longer than hoped, Deputy Secretary Ron Guns and Acting Assistant Secretary Frank Dawson continue to be vocal advocates for filling these positions as soon as the State process will allow.

The OCRM acknowledges that taking a position from other understaffed areas of the Watershed Services Unit or the Department is not ideal, and NOAA does not support aiding one program at the expense of another. However, it is imperative that the Reserve fill its core positions. Having an education coordinator is part of the state's original commitment that accompanied Reserve designation by NOAA in July 1990. At the time of designation, the State of Maryland agreed to have a reserve manager and sufficient staff to adequately implement required staff roles in administration, research, and education/ interpretation, so that the Reserve can perform its required functions and activities. The state budget cuts and hiring policies have greatly hurt the ability of the Reserve program to live up to its potential or to even perform minimally required programs and activities. Because of this, the Maryland Reserve is falling behind the other 26 reserves in the system. This acknowledgement in no way takes away from the successes and accomplishments that the staff members have worked extremely hard to attain and which are recognized in these Findings. However, the evaluation team sensed frustration, exhaustion, and a recognition that they cannot continue the pace and extent of program implementation without additional staff.

Failure to have an education coordinator also creates another issue for the Maryland Reserve. Because the three core positions (manager, research coordinator, and education coordinator) are not filled, the Reserve is not eligible for additional federal funds to conduct the Coastal Training Program (CTP) and for other opportunities to participate in NERRS demonstration projects such as biomonitoring of submerged aquatic vegetation.

NECESSARY ACTION: The Department of Natural Resources must fill the Reserve's education coordinator position within six months of the date of issuance of these findings. If this deadline is not met, NOAA will immediately initiate a problem-specific evaluation pursuant to 16 USC §§ 1458 and 1461 and 15 CFR Part 123.133(b)(9) to address the Reserve's failure to hire an Education Coordinator. Upon completion of this focused evaluation, the State of Maryland's operation and management of the Chesapeake Bay Reserve may be found to be deficient, and the State of Maryland may be found not adhering to the requirements of NERRS' regulations as adopted by the Secretary of Commerce under the CZMA or the terms of its cooperative agreement. If it is so found, the State of Maryland will be subject to sanctions pursuant to 16 USC §§ 1458(c) and 1461 (f), 15 CFR Part 921.33(c), and 15 CFR Parts 923.131-923.135.

In addition to the education coordinator, one position of importance to the Reserve is a designated Coastal Training Program (CTP) coordinator. Although this is not a core position, the Reserve and the state still remain ineligible for CTP funds so long as there is no designated CTP coordinator. (There are other requirements that must be met to be eligible for CTP funds, and the Reserve's status with regard to these requirements is discussed in a later section of this document.) The CTP is a voluntary program in terms of a Reserve's participation and implementation. However, it became quite clear to the evaluation team that several partners and other programs within DNR are familiar with the CTP and believe it would be an ideal mechanism to transfer information to local coastal decision makers—several people identified the program by name and were familiar with its goals. This program is discussed in greater detail elsewhere in these findings.

PROGRAM SUGGESTION: The Department of Natural Resources is strongly encouraged to designate a Coastal Training Program (CTP) coordinator for the Reserve and implement a CTP.

During the period covered by this evaluation, there has been significant staff turnover within the Reserve program. The remaining staff members are trying to conduct existing projects and programs, including those for which an education coordinator and a coastal training program coordinator are normally responsible, which is causing significant stress on the staff. Since the site visit, there also have been changes in management at the Watershed Services Center unit, the Chesapeake Bay Programs level, and at the DNR Deputy Secretary level. The Reserve falls under this chain of command. Additionally, the Reserve's management plan must be revised, which creates the opportunity to address management issues as discussed in these findings. These conditions of staff turnover, current understaffing, the potential addition of new Reserve staff (education coordinator and coastal training program coordinator), changes in DNR senior staff and leadership, and updating the management plan all present challenges to the staff and to Reserve implementation.

Given the multi-component nature of the Reserve, its highly networked structure and partnerships for management and implementation, and the unlikely prospect of significantly increasing the number of Reserve staff in the next several years, the Reserve might begin to think about the direction of its goals and programs in relation to staffing and partnership opportunities. As the Reserve's management plan is revised (see the next section for further discussion), staff needed to implement the management plan should be carefully considered. Whether partners, other DNR staff, or existing or new Reserve staff can assist with or implement programs and projects at one or all of the site components will depend partly upon the priorities established in the management plan. There has been efficiency in using partners to conduct some projects and Reserve programs. Can this be expanded, and if so, where? What could partners do that the Reserve would then not need to be as heavily involved in? This strategic planning with regard to goals, staffing needs, and partnership opportunities will be important for the Reserve to move forward. It can help identify whether cooperative agreement award funds should be directed toward DNR staff support, specific partners, facilities, or programs.

NOAA suggests that a facilitated discussion on the direction of, and issues facing, the Reserve and its staff would be appropriate and timely. Such a discussion could help define staffing needs and roles, opportunities and efficiencies in working with partners, and priorities for the Reserve and its programs and staff, which in turn could be useful in crafting revisions to the management plan.

PROGRAM SUGGESTION: The Reserve should consider conducting a series of meetings or a retreat for staff to more clearly define staffing needs and roles, opportunities and efficiencies in working with partners, and priorities for the Reserve and its programs and staff. These discussions could also address conditions leading to staff turnover, understaffing, the addition of new Reserve staff (education coordinator and coastal training program coordinator), recent personnel changes in DNR leadership levels, and the management plan update.

2. Management Plan

The Reserve currently operates under the management plan developed and adopted in 1990. Evaluation findings dated 1994, 1998, and 2004 included recommendations to complete a revised management plan. For various reasons, the revised plan is still not yet complete, although several chapters of the plan have been written and an initial, incomplete draft has been reviewed by OCRM. According to regulations governing the reserves, the management plan must be revised at least every five years, so the revisions to the Chesapeake Bay-MD management plan are long overdue. As discussed elsewhere in this document, several issues and opportunities that could be addressed in, and guided by, a revised management plan. These are opportunities and issues discussed during the site visit with staff and other partners and include, but are not limited to: potential expansion of the Reserve boundaries at certain component sites (perhaps including expansion of water boundaries) and acquisition of additional properties;

facilities expansion or construction, particularly at Monie Bay, but at the other two components as well; and integration and coordination of activities at all three site components.

As discussed above, the Reserve's staffing needs (through partnership opportunities or dedicated Reserve positions) should be a consideration in, and an outcome of, the development of the plan. The management plan also provides the Reserve with a significant opportunity to define the niche of the Reserve and each site component in the larger national, regional, and state efforts to protect and restore the Chesapeake Bay. The OCRM encourages the Reserve to use its management plan revision process to establish and define the unique opportunities the Reserve and its separate components bring to the larger Chesapeake Bay efforts.

NECESSARY ACTION: The Reserve must complete revisions to its management plan. A complete draft of the revised plan must be submitted to OCRM by September 30, 2006.

3. State Support

An administrative/fiscal officer position was state funded at the beginning of the evaluation period, but because of state budget constraints, it is now entirely supported with federal funds. The research coordinator and the stewardship coordinator are also both funded from the federal award. This, in conjunction with the vacated state-funded education coordinator position (and the potential loss of that position entirely), not only makes state match more tenuous and difficult to provide but creates a concern for OCRM that the DNR and the State have diminished support for the Reserve.

When fully staffed, the Reserve had an excellent record of submitting timely and complete performance reports and financial assistance award applications. The changes and vacancies in staff caused several delays in reporting and caused the need to extend and reprogram several cooperative agreements. This is not a criticism of Reserve staff or acting managers prior to the appointment of a permanent manager in September 2005, but a reflection that State actions have detrimentally affected programming and administration within the Reserve.

Although hiring an education coordinator is certainly the highest staffing priority for the Reserve, OCRM urges the State to transfer the stewardship and research coordinator positions to state funding whenever possible. Such a move will not only make the provision of state match easier, it sends a clear message about state support for the Reserve and the value of its activities.

PROGRAM SUGGESTION: The Department of Natural Resources is urged to support the stewardship coordinator and research coordinator positions with state funding as soon as possible.

4. Facilities and Infrastructure

Multi-component reserves are often challenged by the need for staff and facilities at more than one location. This Reserve is fortunate to have strong partners at all three components. The "Reserve Program Description – Reserve Administration" section of this document details the complex ownership and administration of the components. At Otter Point Creek, the site property is owned by Harford County and the Izaak Walton League. Conservation easements for the Izaak Walton League property have been donated to the State. The on-site manager is a Harford County Parks and Recreation Department employee, who works out of a relatively new estuary center/visitor center. At Jug Bay, the component property is owned and managed by the Maryland National Capital Park and Planning Commission (on the west site of the Patuxent River as Patuxent River Park) and Anne Arundel County (on the east side of the river as the Jug Bay Wetlands Sanctuary). There are two on-site managers located in two separate park facility/visitor centers who are responsible for the Jug Bay portion of the Reserve located in their respective counties.

The Monie Bay component is owned by the State and is managed as part of the DNR's Deal Island Wildlife Management Area. Although the DNR Wildlife and Heritage Service's area manager and staff are directly responsible for the component, there is no dedicated on-site manager or facility at Monie Bay. The 2004 Evaluation Findings included a program suggestion regarding improvements to the capabilities (access, operations, research, and programs) at Monie Bay. Lack of state funding for access, land acquisition, and staff has limited the Reserve's ability to address this recommendation, although the Reserve staff remains committed to seeking ways to target Monie Bay improvements.

Researchers conducting a socio-cultural needs assessment study in the general area discovered that many residents are not familiar with the national estuarine research reserve but know about Monie Bay and the Deal Island Wildlife Management Area. The study showed that the residents would welcome more scientific involvement in the Monie Bay area, focusing particularly on water quality, erosion, and salinity levels. In discussions during the site visit, the evaluation team learned that there is interest in the local community for development of some type of multi-purpose building to serve as a community center. Such a facility could serve as a local visitor center and small research facility for the Monie Bay component as well, providing greater visibility for the Reserve and providing at least some on-site staff whenever DNR or Reserve staff members need to visit or work in the area. Taking local community sentiment and input into consideration, the Reserve could explore possible partnerships and collaborative efforts toward development of such a facility, including public access points to the Monie Bay marshes, and discuss the issue in the revised management plan. In order for any development of facilities at Monie Bay to be successful, the Maryland DNR would need to demonstrate a greater level of commitment of financial and human resources.

PROGRAM SUGGESTION: As part of the development of the revised management plan, the Reserve and its partners should consider the facilities and infrastructure needs, if any, for current and future years at all three components.

5. Coordination and Partnerships

The Reserve works extremely well with a large number of partners and volunteers to manage all the components and program activities. Since the last evaluation, the staffs of site components have coordinated more closely, and Reserve staff has made a concerted effort to integrate the work of all components, so that the successes of a program or a pilot project at one component are transferred to another. The Reserve staff and site managers meet quarterly and at an annual retreat, and Reserve staff attend meetings of The Friends of Jug Bay and the Otter Point Creek Alliance friends group. The Jug Bay, Otter Point Creek, and Monie Bay sites, staff, and volunteers have been involved in multi-component projects, intern exchanges, and volunteer exchange days. The willingness with which partners and volunteers work with Reserve staff indicates both the regard in which they hold Reserve staff members and their knowledge about what the Reserve is, does, and can do. There have been several activities, discussed in later sections of these findings, that have been accomplished because the Reserve staff has been able to "leverage" a partnership for the mutual benefit of all parties and the resources.

The Friends of Jug Bay and the Otter Point Creek Alliance friends groups are strong partners with the Reserve. Their strength in numbers and dedication to the resources serve the Reserve well. Not only do the friends groups assist and even take a lead role in conducting many projects and activities, they serve to alert the on-site managers, the Reserve staff, and local government officials about issues of concerns at the components (for example, incompatible uses, Bush River dredging, boat speeds and noise levels).

ACCOMPLISHMENT: The Reserve has strengthened the partnership and mutual interaction among the three sites with quarterly site manager meetings, annual retreats, intern and volunteer exchanges, and multi-component projects. The Reserve sites benefit from the strong partnerships of friends groups and volunteers.

Because it is the most remote component, has no on-site facility and staff, and has no access to the estuary, there are fewer successful partnerships and collaborative efforts at Monie Bay. During the period covered by this evaluation, the Reserve did try to begin mammalian surveys and conduct water quality monitoring at Monie Bay with academic institutions, but for various reasons they were not initiated. During the site visit, it was noted that there is a need to develop a stronger connection with colleges and universities near Monie Bay. Connections with the University of Maryland-Eastern Shore and Salisbury University are not as strong as in the past. Renewing these relationships and establishing other academic connections could be useful in attracting more research to the Monie Bay area. The University of Maryland-College Park Department of Anthropology conducted a "Socio-Cultural Needs Assessment of The Monie Bay Component" under contract with the Reserve during the period covered by this evaluation. One of the outcomes of this study was to help bring science and community interests closer together, with Monie Bay as the focal point. The study generated significant interest in the Reserve and its programs and activities among area residents. Not only can this study be used to help shape programs to meet the needs of local residents, but an ongoing relationship with faculty and staff

in applied anthropology at UMD-College Park or other academic institutions could provide a means for the Reserve to take a leadership position within the NERRS in terms of interdisciplinary projects and in promoting the reserves as appropriate sites for social as well as natural science research.

PROGRAM SUGGESTION: The Reserve is encouraged to further develop connections and partnerships with academic institutions near Monie Bay. Such partnerships can help attract research to the Monie Bay area and generate greater visibility and support for the Reserve and its programs and activities.

6. Program Visibility

The issue of program visibility is not unique to the Chesapeake Bay-MD Reserve and is a struggle for many reserves. Visibility is not so much an element of "taking credit for accomplishing things" but of being known and visible to groups and people who can and do support the efforts of the Reserve, who can argue for financial support, and who will immediately think of the Reserve as a source of information, data, and collaboration opportunities. There are many agencies, programs, and partnerships involved in the protection and restoration of the Chesapeake Bay, thus making visibility of the Chesapeake Bay-MD NERR as a distinct entity somewhat problematic. Greater program visibility not only benefits the Reserve with stronger support, but other groups and supporters will benefit from the greater Chesapeake Bay connections the Reserve already has in place and can offer. This includes, for example, water quality and submerged aquatic vegetation monitoring data, expertise in the translation of science to coastal decision makers, and a strong connection to and communication with local governments and communities.

Since the last evaluation, entrance signs at Jug Bay Wetlands Sanctuary, Patuxent River Park, and Otter Point Creek indicate the Reserve relationship and logo. However, at least one on-site manager admitted that it is unlikely that the general public is knowledgeable about the "layers" of identity at any particular component – volunteers and those who work closely with the sites are aware of the NERR identity, but most visitors only know the sites as parks or a state wildlife management area.

One of the site managers noted that the National Estuarine Research Reserve designation provides credibility to the research conducted at the site—more so than a designation as a park or recreational facility. He also suggested that DNR and Reserve staff meet with county commissioners and county executive directors for the various site components to discuss and reinforce what NERR designation means and the benefits that are derived from that. Another former Reserve staff member noted the need to market the work done by the Reserve and suggested using local public access channels.

The Reserve's website was revised in 2004, but finding it is extremely difficult. It is six "layers" deep into the Maryland DNR website, and from there one must know to first enter "Resource Management," then "Bays, Streams, and Watersheds," then "Coastal Bays," then

"Restoration and Protection," and then "Coastal Program," before the "National Estuarine Research Reserve in Maryland" link appears. Another slightly more direct approach still takes five steps. A "hot link" on the first page of the DNR website would be extremely helpful for people for whom that layered structure is not intuitive. The Reserve website discusses the site components, but there are no direct links to the Jug Bay Wetland Sanctuary, Patuxent River Park, Otter Point Creek, or Monie Bay/Deal Island Wildlife Management Area (WMA) websites. The DNR website page for Deal Island does not mention that a part of the WMA is part of the Chesapeake Bay-MD NERR.

Site managers discussed with the evaluation team the difficulty they have in getting their research data and information out to the public, other agencies, and scientists, and indicated that the Reserve's website would be one extremely effective way to do this, as would the DNR website, the Reserve's GIS database, and even the national NERRS website technical series. The Reserve's staff shortage over the last several years has made even updating its website very difficult. The Reserve's research, monitoring, education, stewardship, and volunteer involvement efforts are the basic building blocks of a consistent Reserve "message," but a lack of visibility and weak or non-existent links to spread that message significantly hinder the ability to create an atmosphere of strong support from many entities.

The state, the DNR, NOAA, and at least one volunteer with whom the evaluation team met have expertise in public relations and communications. The component sites and the Reserve should take advantage of sucy expertise to spotlight the Reserve, its activities, and a consistent message that will resonate with coastal decision makers and supporters at local, state, and federal levels. Even getting the message about the Reserve's programs and role in Chesapeake Bay protection and restoration to upper levels of DNR management and administration could benefit the Reserve. The DNR should help to make the Reserve's website more accessible to the public, allow additional links to component sites if at all possible, and provide assistance for regular and frequent updates. The Reserve should try to populate its website with as much data and information as possible – research reports, calendars of events, newsletters from component site partners – and should consider archiving these materials there as well.

PROGRAM SUGGESTION: The Reserve and the Department should develop a strategy to communicate the work of the Reserve and should continue efforts to enhance the Reserve's visibility, stressing both its unique identity as well as its role as a partner in many collaborative efforts. In particular, the Reserve's website should be made more accessible and become a forum for sharing research data and other information from the site components.

B. RESEARCH AND MONITORING

1. Research Activities

The Reserve has chosen to focus on submerged aquatic vegetation (SAV) and water quality as its primary areas of research emphasis, mirroring both the Maryland governor's environmental priorities and two of the top issues for the Chesapeake Bay as a whole. The Research Coordinator has done an excellent job coordinating research efforts at three different site components, expanding her contacts and network of scientists within DNR and within academia to introduce more people to the research opportunities at the Reserve, using a range of graduate research fellows and interns from various programs, improving and increasing monitoring activities within the Reserve, and emphasizing the link between water quality and living resources throughout all the research activities.

The Reserve has initiated and funded site-specific research and monitoring efforts at each component that are important to the management of that site. It has also created positions for site-specific research interns (generally DNR seasonal contractual employees who are typically graduate students or recent graduates) to conduct aspects of some research and monitoring projects. During the period covered by this evaluation, approximately eight Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)-funded research projects have been conducted at the Reserve components. Four graduate research fellows (GRFs) were funded and conducted research projects. The research and stewardship coordinators have done a remarkable job of integrating research projects with volunteer and stewardship projects, so that much of the research work is assisted by volunteers. Some of the efforts discussed below involved volunteers, while several other projects involving volunteers are discussed under the Stewardship section.

The Reserve is developing a geographic information system (GIS) database and has employed a GIS intern to begin compiling a digital database of research and related information for each of the components. At Jug Bay the Reserve contracted for 2003 aerial photography of emergent vegetation distribution and species composition, then groundtruthed and georeferenced the photos to serve as base maps. A hyperspectral flyover of the Otter Point Creek and Monie Bay components and subsequent groundtruthing was accomplished in July 2005 by Reserve staff, site managers, and interns in conjunction with NOAA's Environmental Cooperative Science Center. The GIS database and related efforts should prove very useful to the Reserve and the site managers and will be very helpful in developing the Reserve's site profile.

At Jug Bay, the Reserve continues to focus on wild rice restoration ecology through a project initially begun in 2000 to restore native wild rice marshes on the Patuxent River. The project has provided information about the impacts of resident Canadian goose grazing on the plantings and the effectiveness of fencing (heavy grazing occurs outside of fencing), and about the successful ability of wild rice to colonize in areas that were opened up after the invasive *phragmites* was removed through herbicide spraying. Research on red bellied turtles in the Patuxent River and marshes and box turtles in the uplands is focusing on their use of and

migration through these areas; marsh mapping and marsh dynamics research is done to map, quantify, and understand the role of tidal marshes in filtration, nutrient fluxes, and water quality.

At Otter Point Creek, a multi-year study was initiated to determine the major non-tidal sources of sediments and nutrients to the Bush River for use in targeting restoration and improving management efforts. The Research Coordinator initiated several efforts related to SAV research and restoration, including grid studies to track community changes over time; studies to test the effects of individual vs. mixed plantings and cuttings; efforts to test bed size and planting design on restoration success; and effects of pre-existing SAV on the 'success' of the invasive non-native *hydrilla* species. Otter Point Creek was also the site of a partnership effort in 2003 involving the Reserve, NOAA, the Chesapeake Bay Foundation, and the Aberdeen Proving Ground's dive team, testing the efficiency of planting SAV using a mechanized boat versus hand planting using SCUBA divers.

At Monie Bay, efforts were made to initiate mammalian surveys and to seek graduate student assistance with water quality sampling, but both efforts were unsuccessful. The Reserve did contract in 2005 with a researcher to conduct a literature review and compilation for the Monie Bay site profile. The socio-economic study discussed in the "Coordination and Partnerships" section above was completed and will help the Reserve staff target future approaches at Monie Bay. A CICEET-funded project to explore the effects of non-native *phragmites* on juvenile fish population recruitment in the tidal flats was also conducted.

ACCOMPLISHMENT: In response to previous evaluation findings, the Reserve has identified specific focal research issue areas, and the staff members have integrated those research areas across all three site components and across the research, education, and stewardship programs at the Reserve. The Reserve has expanded the network of scientists interested in conducting research in the Reserve and has significantly increased the involvement of interns and student researchers through the Graduate Research Fellows program, the Environmental Cooperative Science Center partners, and the Cooperative Institute for Coastal and Estuarine Environmental Technology.

2. Monitoring

System-wide Monitoring Program (SWMP): Perhaps the Reserve's greatest accomplishment during this evaluation period has been the significant improvement in the SWMP. It has gone from a struggling program to a strong contributor in the national system. During the time period covered by this evaluation, the Reserve upgraded all its sondes, reconfigured the two existing monitoring sites at Jug Bay to capture data more consistently, and added two additional monitoring sites (one each at Jug Bay and Otter Point Creek), for a total of four, in compliance with NERR SWMP protocol. Monthly nutrient sampling at all four sites and monthly diel nutrient sampling at one Jug Bay site have been added. The weather station at Jug Bay has also been upgraded and now conforms to all systemwide protocols. Data collection, accuracy, and timely submission to the Centralized Data Management Office (CDMO) have also improved during this evaluation period.

The Reserve has also been able to enhance its SWMP to include: bi-weekly nutrient sampling at all sites, sampling of additional nutrient parameters at Otter Point Creek, a weather station at Otter Point Creek, and cellular telemetry at two weather and two water quality sites. Real-time and near real-time data is available on the DNR's continuous monitoring website "Eyes on the Bay" (www.eyesonthebay.net).

ACCOMPLISHMENT: The Reserve's SWMP has made significant improvements since the last evaluation, now conforms to all systemwide protocols, and has been enhanced to provide elements beyond requirements for the program. Data collection, accuracy, and timely submission to the CDMO have significantly improved.

As noted in the section above dealing with staffing issues, the Reserve is not eligible for funding for biomonitoring of submerged aquatic vegetation (the next phase of the SWMP) because all of its core positions are not filled. However, the problems with SWMP data, which also kept the Reserve ineligible for biomonitoring funding, have been resolved. The situation regarding the lack of an education coordinator and the ineligibility for biomonitoring funding is disappointing, because the Reserve and the Research Coordinator are conducting some biomonitoring now but are not eligible for funding in support of that. In addition, the NERRS does not benefit from the work being conducted with freshwater SAV at the Reserve. Both the Reserve and the NERRS are disadvantaged because the Education Coordinator position has not been filled.

Non-SWMP Monitoring: The Reserve has been involved in a variety of non-water quality monitoring projects and efforts, including projects like SAV and marsh monitoring, "The Great Herp Search," and fish monitoring, which are either discussed above or in later sections of this document. In terms of water quality, the Reserve began partnering with the DNR's Tidewater Ecosystem Assessment (TEA) Division in 2003 for monitoring, including SWMP maintenance. This has proven to be an excellent partnership. The TEA Division has operated and maintained the four SWMP water quality sites, conducts monthly nutrient sampling and maintains two weather stations for the Reserve. The TEA Division maintains a continuous monitoring program (ConMon), similar to the NERRS SWMP. The ConMon has 39 "SWMP-like" stations maintained throughout the Maryland portion of the Chesapeake Bay, including the Reserve's four SWMP water quality stations. It is important to have the Reserve's stations included in ConMon and as a part of the "Eyes on the Bay" website because these four stations are permanently located, while other ConMon stations are periodically relocated. This allows the Reserve and the state to compare what happens within the Reserve waters to what happens in other parts of the Bay.

During the site visit, several people with whom the evaluation team met mentioned the possibility of expanding the Reserve's water quality monitoring efforts into areas adjacent and up-watershed from the Reserve sites (even outside of the Reserve boundaries), and creating a more expansive terrestrial monitoring effort to compliment the estuarine monitoring. Given the fact that Section 315 funding for monitoring cannot be expended outside the Reserve's borders,

the very small number of Reserve staff members, and the number of recommendations contained in this findings document, NOAA is hesitant to suggest these enhancements and expansions at this time. However, NOAA believes these seem to be logical extensions of the monitoring work currently being conducted by the Reserve and supports whatever efforts the DNR might be able to make with partners and volunteers as opportunities arise.

3. Site Profile

The National Estuarine Research Reserve System regulations at 15 CFR 921.60 require that each Reserve develop basic monitoring programs, the second phase of which involves the development of a site profile. The purpose of the site profile is to review the existing state of knowledge for the Reserve's research and monitoring activities and to identify research and monitoring needs that should be addressed in the future. Although there is no required time frame for development of the site profile, it is generally expected that a Reserve will complete a site profile within three years of designation. The Chesapeake Bay-Maryland Reserve has not yet completed its site profile. As noted above, the Reserve has contracted for a literature review and compilation as a step toward development of the Monie Bay component site profile. This should be completed, because it can help identify research and monitoring needs at the component and be useful in attracting researchers to Monie Bay. The site profiles for Jug Bay and Otter Point Creek need to be completed also. The OCRM is willing to work with the Reserve on the development of a realistic time frame for completion of the site profile and accepts a phased approach that works on each component separately, with submission of a draft for each component as it is developed.

PROGRAM SUGGESTION: The Reserve should work with OCRM to develop a time frame for completion of the Reserve's site profile. The time frame may be phased to address each component separately, with submittal of a draft for each component as it is developed.

C. EDUCATION AND OUTREACH

1. Education and Outreach Programs

Because of the multi-component and administrative/management structure of the Chesapeake Bay-MD NERR, the education component at the Reserve consists of four sub-components with programs and activities initiated by different partners and entities: NERRS systemwide directives; Chesapeake Bay-MD Reserve-initiated; site component-initiated; and DNR-initiated. There has been strong collaboration and cooperation on all activities and programs, regardless of who initiates them. During the period covered by this evaluation, education program development and implementation slowed in the absence of a full-time education coordinator. Existing staff have done an admirable job at conducting several existing successful programs and participating in others, but the time and effort involved can be overwhelming for people who are also responsible for other full-time, required program

elements. Once an education coordinator is hired, he or she should review the education-related activities at the Reserve to more clearly define the focus of activities on which a small staff can dedicate time and effort.

One of the Reserve's very successful educational programs is the annual "Wetlands and Wildlife Field Day" held at Monie Bay. Reserve staff, other site component staff, and volunteers have made this annual two-day event for Somerset County 4th graders a successful outdoor environmental experience for 12 years. The program is tied to the county's 4th grade curriculum dealing with wetlands and wildlife. Over 3,300 children have participated in the experience to date, and some of the high school student volunteers initially participated when they were in 4th grade.

One of the Reserve-wide educational programs developed for use at any of the site components during this evaluation period is entitled "A Blast from the Past," which shows how archaeology can be used as a tool to investigate past land management practices and reveal origins of some of the current environmental problems. The story developed in the project focuses on human history along the Chesapeake Bay and other associated waterways, and provides materials as well as suggestions to modify the program to various age groups.

The Stewardship section to follow in this Findings document discusses more education programs that the Reserve has integrated along with research efforts through the stewardship program. However, with the absence of an education coordinator, the research and stewardship coordinators have had to carry the full weight of these integration and cross cutting efforts. The Reserve must hire a permanent, full-time education coordinator, and this recommendation is addressed in "OPERATION AND MANAGEMENT – Staffing."

The Maryland Association for Environmental and Outdoor Education (MAEOE) encourages, trains, and supports "Maryland educators to build a citizenry that understands and is responsibly engaged in promoting sustainability, addressing human needs and conserving the Earth's natural resources." The Reserve has had some interaction with the MAEOE in the past. One of the Association's initiatives is the Green School/Green School Awards Program, which recognizes Maryland K-12 schools, both public and private, which incorporate local environmental issue investigation and professional development with environmental best management practices and community stewardship. The executive director of the MAEOE is a former Reserve manager who is, therefore, very aware of the existing and potential collaboration opportunities this Reserve has with so many partners at the federal, state, and local level in providing environmental educational opportunities to students in the K-12 grades. Once an education coordinator is hired, the Green School/Green School Awards Program could be an initiative that the Reserve (as well as the NERR system) could adopt and adapt, and the MAEOE could be an organization with whom to strengthen collaboration and partnership ties.

2. Coastal Training Program (CTP)

Because the Reserve does not have an education coordinator or a designated CTP coordinator, the Reserve is not able to receive funds for and official recognition of a coastal training program. These staffing issues are discussed in a previous section of these findings.

Over this evaluation period, staff members have conducted at least nine (three per year) coastal decision maker workshops, which is a requirement for CTP funding and program recognition. The workshops have addressed topics driven by needs at the component sites, including faulty septic tanks, deer management strategies for land managers, and a submerged aquatic vegetation restoration symposium. However, the required CTP planning documents (market analysis, needs assessment, program strategy, and marketing plan) have not been completed by the Reserve and approved by the NERRS CTP Oversight Committee, even though the Reserve has received funding for planning and for pre-operational implementation. On the basis of assurances from the DNR that all required CTP elements and staff would be present, the Reserve even received a year of full implementation funding from NOAA. At the time of the issuance of these findings, however, neither the required staff nor planning documents are in place or have been completed.

The NERR systemwide CTP is not a required program element but is optional for a Reserve to develop and implement. Nevertheless, during discussions and meetings with a variety of partners and interested groups, all mentioned the need to provide coastal decision makers with the science information and research data they need and that is being generated by work within the Reserve and the Chesapeake Bay. Most heartening to OCRM is that all (including programs and staff within DNR) specifically mentioned the coastal training program by name as the best 'translation' mechanism for getting that information to appropriate people. There are also several other potential partners interested in similar work – Sea Grant, the Otter Point Creek Alliance, the NOAA Chesapeake Bay Office, and other programs within the Maryland DNR. There is strong support for meeting the necessary staffing requirements so that the CTP can be established at the Reserve. DNR management has been made aware of this support. The previous section dealing with staffing at the Reserve includes recommendations about hiring an education coordinator and hiring or designating a CTP coordinator so that the Reserve's official coastal training program can seek recognition. However, until the other program approval and recognition elements have been fulfilled, the Reserve will not be eligible for any CTP funding or program recognition.

D. STEWARDSHIP AND RESOURCE MANAGEMENT

The stewardship and resource management activities at the Reserve represent a very good integration of research and education. The Stewardship Coordinator has done an excellent job of working with the Research Coordinator, component site managers and staff, and other partners and entities to facilitate partnerships and coordinate activities, particularly in the absence of an Education Coordinator or CTP Coordinator. The stewardship program is strongly volunteer-oriented, which is somewhat natural given the extremely small number of Reserve staff members and the fact that the Stewardship Coordinator (both position and person) was the Volunteer Coordinator until the position title change occurred in 2004.

1. Stewardship

The stewardship activities conducted by the Reserve broadly fall into two general categories: monitoring efforts and restoration activities. Both very effectively use volunteers.

Monitoring Efforts: These activities are generally designed to help researchers and site managers obtain baseline data or track trends while providing an educational experience for the participants as well as an opportunity for local residents to become more familiar with the resources around them and to develop a sense of stewardship and responsibility for those resources.

At Otter Point Creek, a fish seining and monitoring program has been conducted since 1998. Initially, the DNR Fisheries Service began the program as an educational volunteer project at two sampling sites. Since that time, the project evolved to collect baseline data in 2001; additional seining sites were added in 2004; trawling sites were added in 2005; and larval fish surveys were added in 2005 at some historic sites. The monitoring is still a volunteer project, but it is now fully incorporated into the DNR Fisheries Study. The changes in monitoring and project objectives are designed not only to build a robust dataset but to help identify changes over time and the effects of increasing development on fish habitat and communities. Tidal fish seining surveys are also conducted at Jug Bay.

A herpetology monitoring program is also conducted at Otter Point Creek and Jug Bay. Reptiles and amphibians are good indicators of ecosystem health because of their close association with aquatic habitats and their sensitivity to different stresses. Herp populations are monitored to establish baseline data for species diversity, habitat preferences, and overall health of herps living in the area. The project also helps site managers determine the effects of land management practices on herp populations. Volunteers assist with research and monitoring through the North American Amphibian Monitoring Program Calling Surveys (the Reserve is part of the USGS international effort to quantify global amphibian declines), the Great Herp Search, and box turtle surveys.

Monitoring is also conducted by volunteers, staff, and interns for both tidal and non-tidal water quality at Otter Point Creek and Jug Bay. A monitoring program has also been designed for volunteers called "SAV Hunts." This is a series of one-day events where volunteers, led by Reserve or site staff, sample a minimum of five sites seasonally throughout the SAV growing season to collect data to help clarify the relationship between SAV community composition and health at sites where water quality data are also measured. SAV hunts have been conducted at Otter Point Creek and Jug Bay.

Restoration Efforts: Restoration efforts in the Reserve have focused on SAV and native wild rice (*Zizania aquatica*, an emergent aquatic vegetation--EAV). "Grasses to the Masses" teaches participants about the importance of SAV in the Chesapeake Bay, its status, how to grow the plants, and how to plant seed stock at their homes to grow two different types of native freshwater SAV species. Ten weeks later the volunteers then participate in a restoration effort at one of the component sites of the Reserve by planting the plants they grew at home. Reserve

staff also conducted seasonal SAV monitoring surveys at all three components during the period covered by this evaluation to catalog the timing of the appearance of different SAV species and document any new invasions of non-native species. Reserve staff also maintains and plants outdoor propagation tanks at Jug Bay and Otter Point Creek, in which native freshwater species are grown and used in restoration and education.

In 1998 a wild rice project began at Patuxent River Park in the Jug Bay component with a research focus: the disappearance of the Sora rail (a bird) within the marsh, and the connection between resident Canadian geese and the reduction in wild rice stands. Now, however, the focus of the project is restoration, and volunteers and staff are involved in all phases of the project: fence installation and maintenance, seed/plant transplanting, and seed collection and processing.

ACCOMPLISHMENT: The stewardship activities at the Reserve are an excellent integration of research and education. The restoration strategies are solidly based on science but give the staff and volunteers involved a strong sense of ownership and responsibility. With the lengthy absence of an education coordinator, the Stewardship Coordinator, in conjunction with the Research Coordinator and site component managers, has provided an educational experience in all stewardship activities and has assisted with educational and public programming at the individual component sites.

B. Volunteer Program and Coordination

Until 2004, the Stewardship Coordinator had the title of Volunteer Coordinator, and she is still heavily involved in that role. Volunteer management occurs on a daily basis and is primarily component site-specific, so the overall coordination of volunteers is being transitioned to the site volunteer coordinator and site manager. The Stewardship Coordinator is mentoring the component site staff to help assume greater responsibility for time-intensive stewardship projects that involve volunteers (for example, "Grasses to the Masses") and to more directly manage and coordinate volunteers. This is critical for a reserve with such a small number of staff members. The Stewardship Coordinator also recognizes this provides more time for her to devote to data and information translation and other stewardship activities.

The Stewardship Coordinator has assisted with volunteer recognition and appreciation events at Jug Bay and Otter Point Creek, and the Reserve has also coordinated and implemented the inclusion of volunteers from the Monie Bay component to events at Jug Bay and Otter Point Creek.

ACCOMPLISHMENT: The Reserve benefits greatly from very active "friends" organizations and a dedicated corps of volunteers. It recognizes the importance of appreciation events for the volunteers and friends to honor their commitment of time and energy to the Reserve and its natural resources.

V. CONCLUSION

Based upon the recent evaluation of the Chesapeake Bay-MD Estuarine Research Reserve, I find that the state of Maryland is minimally adhering to the programmatic requirements of the National Estuarine Research Reserve System in its operation of the Chesapeake Bay-MD NERR. However, OCRM is concerned about the effect of events and decisions on the Reserve during this evaluation time period and about whether the Chesapeake Bay-MD NERR will be able to continue to implement and enforce the federally approved program and adhere to programmatic obligations.

The Chesapeake Bay-MD NERR has made progress in the following areas: (1) Operations and Management; (2) Research and Monitoring; and (3) Stewardship and Resource Management.

The evaluation team identified the following areas where the Chesapeake Bay-MD NERR could be strengthened or improved: (1) Operations and Management; and (2) Research and Monitoring.

These evaluation findings contain nine (9) recommendations: two (2) Necessary Actions that are mandatory and seven (7) Program Suggestions. The state must address the Necessary Actions by the dates indicated. If the Chesapeake Bay-MD Reserve does not hire an Education Coordinator by the date indicated, NOAA will immediately initiate a problem-specific evaluation to address the Reserve's failure to do so. Upon completion of the focused evaluation, the State of Maryland's operation and management of the Chesapeake Bay-MD Reserve may be found to be deficient, and thus the State of Maryland may be found not adhering to the requirements of NERRS' regulations as adopted by the Secretary of Commerce under the CZMA or the terms of its cooperative agreement. The Program Suggestions should be considered by the Chesapeake Bay-MD National Estuarine Research Reserve prior to the next §312 evaluation of the program.

This is a programmatic evaluation of the Chesapeake Bay-MD National Estuarine Research Reserve that may have implications regarding the state's financial assistance awards(s). However, it does not make any judgment about or replace any financial audits.

May 30, 2006
Date

/S/ David M. Kennedy
David M. Kennedy, Director
Office of Ocean and Coastal
Resource Management

APPENDIX A

RESPONSE BY THE CHESAPEAKE BAY-MD NERR TO PREVIOUS EVALUATION FINDINGS (DATED 2004)

PROGRAM SUGGESTION: MD CBNERR is encouraged to take action to foster a stronger sense of partnership among the components through the identification of the sites as National Estuarine Research Reserve sites and the expansion of mutual interaction among the components.

> Response: The Maryland Reserve is committed to maintaining integration of its component sites in the State program and NERRS.
>
> NERR Identification: Improved NERR site identification has been implemented. The Patuxent River Park, Jug Bay Wetlands Sanctuary, and Otter Point Creek (Leight Park) have entrance signs and other public materials that highlight involvement of the local site in NERRS. Additionally, the Maryland Reserve revised its Internet site in 2004 (http://www.dnr.state.md.us/bay/cbnerr/) to more clearly present the NERR connection and activities of the Reserve. Also, relationships to NERRS and the Maryland Reserve are communicated through continuing distribution of National/State Program materials at component site offices and staff reiteration of these relationships during programs and other public interactions. Examples include Maryland Reserve staff participation in Friends Group meetings and regular articles by the Maryland Reserve in newsletters associated with the Jug Bay Wetlands Sanctuary and Otter Point Creek/Anita Leight Estuary Center.
>
> Mutual Interaction among Components: The partnership and mutual interaction among Maryland Reserve component sites and the State office has been strengthened during the past three years and is a continuing focus of the Maryland Reserve. Quarterly Site Manager meetings provide a regular forum for exchange of ideas and strengthening working relationships. Staff from all the Maryland Reserve components and the State office work together on multi-component projects like water quality monitoring, intern exchanges (initiated 2004), Wetlands and Wildlife Field Day at Monie Bay, and the Annual Reserve Retreat. Additionally, multi-component projects like the SAV hunt, wild rice work, and volunteer exchange days involve Otter Point Creek and Jug Bay, including Jug Bay Wetlands Sanctuary (JBWS) and Patuxent River Park (PRP).

PROGRAM SUGGESTION: MD CBNERR is encouraged to continue the expansion of the research program through the definition of priority needs for research at each component as it relates to the overall MD CBNERR. Opportunities for, and in support of research should be detailed and made available to research institutions. Activities to improve the SWMP are also encouraged.

RESPONSE: At the last evaluation three years ago, significant improvements had been made in the Maryland Reserve's research and monitoring programs but these improvements were a work-in-progress as identified in the 2002 Evaluation.

Research: Since 2002, the Maryland Reserve has clarified its research focus by identifying submerged aquatic vegetation and water quality as priority needs. The new management plan, which is scheduled for public review and adoption in early 2006, incorporates these priorities, outlines clear research goals and identifies potential research projects for each Reserve component. These research priorities were chosen to meet local site needs within the Reserve and to help meet needs identified by the Chesapeake Bay Program. The Maryland Reserve has partnered with numerous researchers to help address these priority needs and these needs are communicated to potential research partners.

Monitoring: In 2003, the Maryland Reserve began partnering with MDNR's Tidewater Ecosystem Assessment (TEA) Division for monitoring including SWMP maintenance. This partnership has improved our SWMP effort and simultaneously fostered better integration of the Maryland Reserve with NERRS, NOAA and within MDNR. Overall, MDNR TEA maintains a Continuous Monitoring Program (ConMon) similar to SWMP, whereby as many as 39 psuedo SWMP stations are maintained throughout the Maryland portion of the Chesapeake Bay. Included in those 39 stations are the Maryland Reserve's four water quality sites that are and have been maintained according to NERR protocol since 2003. In addition to operation/maintenance of the four SWMP water quality sites, MDNR also conducts monthly nutrient sampling and maintains two weather stations for the Maryland Reserve. Through this partnership, the Maryland Reserve currently meets all NERR and SWMP protocols, it gains additional expertise and capabilities including two technicians, and data collection/ processing is more accurate and timely. Some examples of current benefits of this arrangement, which uses State funds to leverage Federal funds, include: 1) use of telemetry to speed data collection at 2 to 4 SWMP sites; 2) operation of an additional (third) weather station; 3) additional discrete sampling to provide added spatial resolution; 4) water quality mapping cruises that provide a high degree of spatial resolution around SWMP sites, and; near real-time publication of data and education information accessible via the internet at www.eyesonthebay.net. Plans for the near future include expansion of the monitoring network to Monie Bay scheduled for 2006.

PROGRAM SUGGESTION**:** MD CBNERR is encouraged to address access and program issues at the Monie Bay Component. Acquisition of appropriate properties to provide for a base of operations for programs and research is encouraged.

RESPONSE: The Maryland Reserve concurs that enhancing capabilities for access, operations, research and programming at Monie Bay is important. The

Reserve is working to maintain and expand these capabilities.

Access and Land Acquisition: The ability to improve access and operational capacity at Monie Bay has been limited. Opportunities that did arise were hampered and/or prevented from succeeding when negotiations failed or when necessary funds could not be assembled. During the past three years, no funding was available from State land acquisition programs. However, hiring for at least one operational staff is underway, and, consistent with the scheduled 2006 Maryland Reserve Management Plan, potential land acquisition opportunities will be cultivated in anticipation of potential future funds.

Programming: The premier Maryland Reserve program at Monie Bay is the greatly successful Wetlands and Wildlife Field Day. Jointly sponsored by DNR's Wildlife and Heritage Division, the Field Day strives to bring every fourth grade student in Somerset County to a full-day hands-on interactive field educational experience. In 2003 and 2005, about 300 students each year participated. (2004 was canceled due to Hurricane Ivan.) Expanding programming at Monie Bay has been a challenge due to limited staff/funding resources and the remoteness of this area geographically and attitudinally. Many residents of this area, particularly new populations moving into the County, have little or no connection to local natural resources. To help address these issues, a socio-economic study focusing on Monie Bay was completed in 2005. Also during the evaluation period, a reduction in operational budgets and a State hiring freeze contributed to a reduction in available operational staff. To help address the operational staff loss affecting Monie Bay and to help maintain Maryland Reserve programs, Maryland Reserve funding was provided to help cover costs for a part-time volunteer coordinator in 2003.

Research**:** Efforts to promote and support research at Monie Bay are continuing. During 2005, a hyperspectral flyover was conducted at Monie Bay. Over 20 staff, volunteers and interns worked at Monie Bay for 3-5 days in July, and work began to produce a Monie Bay Site Profile.

PROGRAM SUGGESTION: MD CBNERR is encouraged to continue to develop its Management Plan in a timely fashion and work closely with OCRM/ERD on its submission. MD CBNERR is also encouraged to explore the expansion of existing boundaries of the three component sites and acquire adjacent properties where appropriate as part of the revised management plan.

RESPONSE: Since adoption of the last Maryland Reserve management plan in 1990, land acquisition has occurred using State and/or local funds at Otter Point Creek and Jug Bay (Wetlands Sanctuary and Patuxent River Park). Acquisition was also attempted at Monie Bay that did not come to fruition. The general intent of this acquisition activity was to enable expansion the Maryland Reserve boundary to adjacent properties owned by the local jurisdiction or the State in fee

simple title. In some cases, Memorandums of Understanding have been prepared between the State and local jurisdiction that would, with concomitant adoption of an updated Maryland Reserve management plan, formally incorporate specific properties into the Maryland Reserve.

Management Plan**:** During the period 2002 to 2005, significant progress was made toward completion of the management plan. However, loss of the full time Maryland Reserve Manager in 2004 handicapped efforts to finalize a draft. After the new Maryland Reserve Manager began work August 31, 2005, NOAA's Program Specialist was asked to comment on the working draft management plan as it existed in July 2005. The Maryland Reserve appreciates the recommendations for several improvements to the draft management plan and the offers by NOAA's Program Special to assist the Maryland Reserve with achieving consensus for land acquisition and for facilities planning. In cooperation with NOAA and site managers, the Maryland Reserve is committed to integrating the recommended plan improvements and finalizing an updated management plan by Spring 2006.

Acquisition and Boundary Expansion: The 2006 management plan will include an overall vision for land protection associated with the Maryland Reserve. The plan will also outline a direction for potential expansion of Maryland Reserve boundaries and for potential land acquisition to meet Maryland Reserve goals and objectives, to complement its existing component sites and to facilitate local site management and operations.

PROGRAM SUGGESTION: Due to the cooperative nature of this program, it is essential that the State maintain its funding for core positions. Also, the Special Award Conditions included in the annual award and signed by the State include language requiring travel to certain meetings. The special Award Conditions state "the Reserve manager must attend the Annual Coastal Program Managers meeting in Washington D.C. and the reserve manager, the research coordinator, and the education coordinator will attend the Annual National Estuarine Research Reserve meeting held at a select Reserve." The State should follow these agreed upon conditions.

RESPONSE: The Maryland Reserve agrees that maintaining and supporting core staff positions is critical to the operation of the program. The Maryland Reserve also agrees that staff participation in national coordination programs is a necessary and valuable activity for Maryland Reserve staff.

The Maryland Reserve's core positions, and the Stewardship/Volunteer Coordinator position, were filled and working as a team through 2003 into 2004. Then, the Reserve Manager's resignation in Summer 2004 occurred during a time of State budget deficits that led to an overall reduction in the number of State employees and enforcement of a general hiring freeze for State employees that continues to the present time. Fortunately, the Education Coordinator was able to

serve as acting manager for a time. This stopgap measure avoided severe program dislocation but generated significant strain on Maryland Reserve staff. Then, the resignation of the Education Coordinator in Summer 2005 created a critical staff shortage for the Maryland Reserve.

Maryland DNR's successful strategic response to this difficult situation was to fill the Reserve Manager position by relocating an existing staff person, including his full-time State employee position, from another DNR unit. This action is allowing the Maryland Reserve to regroup and also demonstrates Maryland DNR's commitment to the Maryland Reserve program.

The Maryland Reserve is also committed to filling the Education Coordinator position with qualified staff at the earliest possible opportunity. Action to obtain permission to hire an Education Coordinator is currently in process.

APPENDIX B

PERSONS AND INSTITUTIONS CONTACTED

U.S. Senators
Honorable Paul Sarbanes
Honorable Barbara Mikulski

U.S. Representatives
Honorable Wayne Gilchrest
Honorable C. A. Dutch Ruppersberger
Honorable Benjamin Cardin
Honorable Steny Hoyer

Maryland Department of Natural Resources
Ron Guns, Assistant Secretary for Chesapeake Bay Programs (at the time of the site visit)
Frank Dawson, Director, Watershed Services Center (at the time of the site visit)
Gwynne Schultz, Director, Coastal Zone Management Division
Margaret McGinty, Fisheries Service
Chris Heyer, Resource Assessment Service
William McInturff, Wildlife and Heritage Service
John Moulis, Wildlife and Heritage Service

Chesapeake Bay-MD National Estuarine Research Reserve
Ken Shanks, Reserve Manager
Julie Bortz, Research Coordinator
Andrea Hardy-Campo, Stewardship and Volunteer Coordinator

Maryland-National Capital Park and Planning Commission, Prince George's County (Jug Bay Component)
Anthony Nolan, Assistant Chief, Natural and Historical Resource Division
Greg Lewis, Nature Facility Program Manager, Patuxent River Park
Mary Kilbourne, Park Naturalist, Patuxent River Park

Anne Arundel County (Jug Bay Component)
Tom Dolan, Assistant Director, Department of Recreation and Parks
Chris Swarth, Director, Jug Bay Wetlands Sanctuary
Elaine Frieble, Naturalist, Jug Bay Wetlands Sanctuary
Alice Rohrer, Administrative Assistant, Jug Bay Wetlands Sanctuary

Harford County (Otter Point Creek Component)
Joe Pfaff, Director, Parks and Recreation Department
Bob Lee Geddes, Senior Engineer, Parks and Recreation Department
Michele Dobson, Environmental Scientist, Department of Public Works
Shanna Schoen, Park Manager, Leight Park/Anita C. Leight Estuary Center, Parks and Recreation Department
Robert Finton, Park Naturalist, Leight Park, Parks and Recreation Department (and former Reserve Education Coordinator)

Friends of Jug Bay
Judy Burke, Co-President
Peggy Brosnan, Co-President
Susan Blackstone, Board Member
Al Tucker, Board Member
Mike Quinlan, Board Member
Brian Woodward, Board Member

Otter Point Creek Alliance
Gene Burg, President and Volunteer at Otter Point Creek Component
Barry Napp, Volunteer at Otter Point Creek Component
Sharyn Spray, Volunteer at Otter Point Creek Component

Other Organizations and Representatives
Dr. Michael Paolisso, University of Maryland
Lucinda P. Power, University of Maryland
Dennis Whigham, Smithsonian Environmental Research Center
Fred Gillotte, Jr., Conservancy Director, Harford Chapter, Izaak Walton League
Carol Towle, Executive Director, Maryland Association for Environmental and Outdoor Education and former Reserve Manager
Kathleen Ellett, Volunteer at Jug Bay Component and former Reserve Manager

APPENDIX C

PERSONS ATTENDING THE PUBLIC MEETING

The public meeting was held on Monday, November 14, 2005, at 7:00 p.m., at the Jug Bay Wetlands Sanctuary, 1361 Wrighton Road, Lothian, (Anne Arundel County), Maryland.

Jeff Shenot, Friends of Jug Bay
Al Tucker, Friends of Jug Bay
Peggy Brosnan, Friends of Jug Bay
Judy Burke, Friends of Jug Bay
Dotty Mumford, Friends of Jug Bay
Susan Blackstone, Friends of Jug Bay
Kathy Ellett, Volunteer at Jug Bay
Chris Swarth, Jug Bay Wetlands Sanctuary staff
Alice Rohrer, Jug Bay Wetlands Sanctuary staff
Elaine Friebele, Jug Bay Wetlands Sanctuary staff
Dennis Whigham, Smithsonian Environmental Research Center

APPENDIX D

WRITTEN COMMENTS RECEIVED AND NOAA'S RESPONSES

No written comments were received regarding the administration or management of the Chesapeake Bay-MD NERR.

APPENDIX E

LIST OF ACCOMPLISHMENTS AND RECOMMENDATIONS

ACCOMPLISHMENTS

Operations and Management

- **Staffing:** The staff members of the Reserve are dedicated and highly respected professionals who, despite significant challenges during this evaluation period, are responsible for the achievements and successes as outlined in these findings.

- **Coordination and Partnerships:** The Reserve has strengthened the partnership and mutual interaction among the three sites with quarterly site manager meetings, annual retreats, intern and volunteer exchanges, and multi-component projects. The Reserve sites benefit from the strong partnerships of friends groups and volunteers.

Research and Monitoring

- **Research Activities:** In response to previous evaluation findings, the Reserve has identified specific focal research issue areas, and the staff members have integrated those research areas across all three site components and across the research, education, and stewardship programs at the Reserve. The Reserve has expanded the network of scientists interested in conducting research in the Reserve and has significantly increased the involvement of interns and student researchers through the Graduate Research Fellows program, the Environmental Cooperative Science Center partners, and the Cooperative Institute for Coastal and Estuarine Environmental Technology.

- **Monitoring:** The Reserve's SWMP has made significant improvements since the last evaluation, now conforms to all systemwide protocols, and has been enhanced to provide elements beyond requirements for the program. Data collection, accuracy, and timely submission to the CDMO have significantly improved.

Stewardship and Resource Management

- **Stewardship:** The stewardship activities at the Reserve are an excellent integration of research and education. The restoration strategies are solidly based on science but give the staff and volunteers involved a strong sense of ownership and responsibility. With the lengthy absence of an education coordinator, the Stewardship Coordinator, in conjunction with the Research Coordinator and the site component managers, has provided an educational experience in all stewardship activities and has assisted with educational and public programming at the individual component sites.

● **Volunteer Program and Coordination:** The Reserve benefits greatly from very active "friends" organizations and a dedicated corps of volunteers. It recognizes the importance of appreciation events for the volunteers and friends to honor their commitment of time and energy to the Reserve and its natural resources.

RECOMMENDATIONS

Operations and Management

● **NECESSARY ACTION (Staffing):** The Department of Natural Resources must fill the Reserve's education coordinator position within six months of the date of issuance of these findings. If this deadline is not met, NOAA will immediately initiate a problem-specific evaluation pursuant to 16 USC §§ 1458 and 1461 and 15 CFR Part 123.133(b)(9) to address the Reserve's failure to hire an Education Coordinator. Upon completion of this focused evaluation, the State of Maryland's operation and management of the Chesapeake Bay Reserve may be found to be deficient, and the State of Maryland may be found not adhering to the requirements of NERRS' regulations as adopted by the Secretary of Commerce under the CZMA or the terms of its cooperative agreement. If it is so found, the State of Maryland will be subject to sanctions pursuant to 16 USC §§ 1458(c) and 1461 (f), 15 CFR Part 921.33(c), and 15 CFR Parts 923.131-923.135.

● **PROGRAM SUGGESTION (Staffing):** The Department of Natural Resources is strongly encouraged to designate a Coastal Training Program coordinator for the Reserve and implement a CTP.

● **PROGRAM SUGGESTION (Staffing):** The Reserve should consider conducting a series of meetings or a retreat for staff to more clearly define staffing needs and roles, opportunities and efficiencies in working with partners, and priorities for the Reserve and its programs and staff. These discussions could also address conditions leading to staff turnover, understaffing, the addition of new Reserve staff (education coordinator and coastal training program coordinator), recent personnel changes in DNR leadership levels, and he management plan update.

● **NECESSARY ACTION (Management Plan):** The Reserve must complete revisions to its management plan. A complete draft of the revised plan must be submitted to OCRM by September 30, 2006.

● **PROGRAM SUGGESTION (State Support):** The Department of Natural Resources is urged to support the stewardship coordinator and research coordinator positions with state funding as soon as possible.

● **PROGRAM SUGGESTION (Facilities and Infrastructure):** As part of the development of the revised management plan, the Reserve and its partners should consider the facilities and infrastructure needs, if any, for current and future years at all three components.

● **PROGRAM SUGGESTION (Coordination and Partnerships):** The Reserve is encouraged to further develop connections and partnerships near Monie Bay. Such partnerships can help attract research to the Monie Bay area and generate greater visibility and support for the Reserve and its programs and activities.

● **PROGRAM SUGGESTION (Program Visibility):** The Reserve and the Department should develop a strategy to communicate the work of the Reserve and should continue efforts to enhance the Reserve's visibility, stressing both its unique identity as well as its role as a partner in many collaborative efforts. In particular, the Reserve's website should be made more accessible and become a forum for sharing research data and other information from the site components.

Research and Monitoring

● **PROGRAM SUGGESTION (Site Profile):** The Reserve should work with OCRM to develop a time frame for completion of the Reserve's site profile. The time frame may be phased to address each component separately, with submittal of a draft for each component as it is developed.