



Maryland Wetland Program Plan 2021 – 2025

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Introduction

The State of Maryland has implemented regulatory programs in tidal wetlands since 1972 and in nontidal wetlands since 1989. The State also has regulatory programs for water use and construction in waterways and floodplains. This Wetland Program Plan (WPP) articulates Maryland's goals, objectives, and key tasks to be accomplished over the next several years in the implementation of a balanced and effective Wetland Program in the State of Maryland. This WPP updates the Maryland Wetland Conservation Plan of 2003 and the Wetland Monitoring Strategy of 2010. The WPP encompasses wetland regulation; wetland restoration and protection; monitoring and assessment; and wetland water quality standards.

Maryland's 9,837 square miles of land area lie in five distinct physiographic provinces, making it one of the most geologically and hydrologically diverse states in the northeastern United States. The five physiographic provinces, from east to west, include: the Coastal Plain, the Piedmont, the Blue Ridge, the Valley and Ridge and the Appalachian Plateau.

The topography of Maryland is highly variable; the land surface elevation increases gradually from the Atlantic Ocean across the Coastal Plain, and then increases rapidly over the Piedmont Province and the ridges of the Appalachian Plateau, culminating in the highlands of the Allegheny Plateau in Garrett County. The boundary between the Piedmont and Coastal Plain Provinces is commonly known as the 'Fall Line,' because of the dense concentration of falls throughout the area, and is characterized by rapid changes in geologic, topographic and hydrologic features.

There are an estimated 757,000 acres of mapped vegetated wetlands. Palustrine wetlands comprise most of the wetlands in Maryland, followed by estuarine wetlands. Palustrine wetlands are diverse in type, including forested, shrub, and emergent in both tidal and nontidal wetlands, as well as nontidal bogs, fens, and vernal pools.

Estuarine vegetated wetlands comprise an estimated 240,000 acres. (MDE, 2010).

Wetland restoration, creation, and enhancement is undertaken through multiple public and private efforts. Wetland gains may qualify as best management practices toward nutrient and sediment reductions toward the TMDL for Chesapeake Bay and the overall Chesapeake Bay Agreement commitment toward wetland gains of 85,000 new acres of wetlands and an additional 150,000 acres of wetlands to be enhanced. During the period from 2016-2019, there were reported gains of 895 acres of wetlands which were re-established, 83 acres of wetlands which were created, and 3,262 acres of wetlands which were enhanced. From 1998-2019, there were reported gains of 215,935 acres of wetlands restored, created, or enhanced in Maryland.

Detailed information about the types and distribution of Maryland's wetlands may be found in the *Maryland Wetland Conservation Plan* at:

<http://mde.maryland.gov/programs/Water/WetlandsandWaterways/MDWetlandConservationPlan/Pages/index.aspx>

Revisions from 2016-2020 Maryland Wetland Program Plan

Additional information has been added to the background sections for Regulatory, Monitoring and Assessment, and Restoration and Protection sections.

The names of agency representatives involved in development and review of the Maryland Wetland Program Plan have been updated.

The following new tasks have been added:

- 1.1.7 Seek funding and improve data layers for streams
- 1.1.8 Conduct periodic updates of shoreline inventories
- 1.2.3 Develop tracking and/or notification system for Special Conditions
- 1.2.4 Seek funding to expand capability of receiving digital application submissions
- 1.6.4 Create fillable digital joint permit application forms
- 1.7.2 Create new guidance and review criteria for considering climate change and increased precipitation in regulatory review
- 1.8.5 Improve reporting and tracking capability of individual water quality certifications and coastal zone consistency determinations
- 1.11.1 Acquire tools and supplies for staff to use while teleworking
- 1.11.2 Revise regulations to allow for virtual public hearings

- 2.1.1h Improve metrics and performance standards for wetland mitigation sites
- 2.1.2 Improve integrated management of submerged aquatic vegetation (SAV) and tidal marsh; seek funding for mapping, guidance, long-term effects of living shorelines and over water structures on SA
- 2.2 Improve success of stream restoration projects.

- 3.1.1a Complete forest patch analysis that can be added to other restoration and conservation tools.
- 3.2.3 Seek funding to develop guidance for balancing living shoreline projects with submerged aquatic vegetation restoration and protection.

- 4.2.1 Update regulations for hearings and information requirements
- 4.2.2 Conduct training for staff on water quality standards and review process
- 4.2.3 Update database for tracking of individual water quality certifications

The following existing tasks have been revised:

- 1.2.1 Evaluate regulations to identify areas where requirements result in inefficient permit review and do not advance wetland protection.
- 1.4.1 a Conduct field and geospatial studies of non-structural shoreline stabilization (living shoreline) sites, including long-term stability, resilience to sea level rise and other stressors, and ecological function related to natural vegetated tidal wetlands
- 2.1.1e Participate in 2021 NWCA field assessment, pending sufficient funding

Additional participating agencies have been added to some tasks.

A new section showing progress on tasks and schedule has been added.

The Living Shorelines Protection Act has been added to Appendix B:

Goals and Objectives

1. Regulatory

Maryland authority governing wetlands and waterways closely parallels federal controls under the Clean Water Act, but evolved from three separate acts of the Maryland General Assembly. In 1933, the assembly recognized that man-made changes to a stream or other body of water may result in flooding, adverse impacts to fish habitat and migration, and increased erosion. The Waterway Construction Statute was passed to regulate activities in streams and their 100-year floodplains. In 1970, tidal wetlands were given state protection. Then, a commitment to increase the protection of nontidal wetlands contained in the 1987 Chesapeake Bay Agreement resulted in 1989 legislation, which established a state nontidal wetlands program that began partial implementation in 1989 and full implementation in 1991.

Tidal wetlands are managed to provide reasonable use while furnishing essential resource protection. Licenses, issued by the State's Board of Public Works (based on recommendations from MDE's Water and Science Administration (WSA)), are required for projects that impact State wetlands. The Board of Public Works (BPW) is comprised of the Governor, the Comptroller of the Treasury, and the State Treasurer. Permits are issued directly by WSA for projects in private wetlands and for projects that the BPW has delegated to MDE its authority to issue (construction or replacement of pilings, fixed or floating piers, decks, walkways, boathouses, and related structures on piers) A permit or license must be obtained before a person fills, dredges, or otherwise alters a tidal wetland. Typical projects include: shoreline protection projects including marsh creation, stone revetments, and bulkheads; piers; dredging; and stormwater discharges.

The Nontidal Wetlands Protection Act seeks to protect nontidal wetlands by regulating and restricting activities that could adversely impact nontidal wetlands or waters of the state. The Act helps to ensure "no net loss" in wetlands acreage and function, by requiring mitigation or compensation for any unavoidable wetland losses. The Act also has provisions for the structuring of an effective and efficient permitting process for the permitting of activities, such as development projects, in wetlands. Finally, the Act directs the Department to assist local governments in undertaking nontidal wetland management planning, and provide technical assistance; conduct educational programs; and purchase, restore and create nontidal wetlands and adopt standards for planning, regulating, restoring, and creating, and enhancing nontidal wetlands.

From its inception, Maryland's nontidal wetlands protection program was designed to parallel many aspects of Section 404 of the Clean Water Act (CWA). Regulated activities include:

- Removal, excavation, or dredging of soil or materials of any kind;
- Changing existing drainage or flood retention characteristics;
- Disturbance of the water level or water table by drainage, impoundment, or other means;
- Filling, dumping, discharging of material, driving piles, or placing obstructions;
- Grading or removal of material that would alter existing topography; and
- Destruction or removal of plant life.

Three aspects of Maryland law differ from federal regulation: Maryland law provides explicit authority over isolated wetlands; Maryland law goes further than federal nontidal wetlands law by also regulating the alteration of vegetation and hydrology; and, Maryland law goes further than federal nontidal wetlands law by also regulating activities within a 25-foot buffer of nontidal wetlands.

Maryland uses a number of mapping tools and applications to aid in regulatory review. See Appendix B for descriptions and Section 3, Restoration and Protection.

Specific Regulatory Goals, Objectives and Action Items

Goal 1: Increase the Efficiency and Effectiveness of Wetlands Regulation and Management in Maryland

1.1 Objective: Update and enhance screening system with additional data layers on wetland extent and other resources of interest.

Rationale: The screening system is used in initial application processing or pre-application review to identify mapped wetlands on the subject parcel, as well as other regulated 100-year floodplains, and to determine proximity to other features such as sensitive species, navigation channels; and historic and cultural resources. Proximity to certain mapped features is a factor in deciding whether applications need to be circulated to other agencies (e.g., DNR) for input. Updated data layers are needed to improve identification of potential resources of concern and improve the efficiency of coordination between agencies.

Action items:

1.1.1 Establish a common, recommended wetland guidance map using available GIS layers and designate the layer(s) as the recommended source for guidance and planning. This map would consolidate the available map layers into a single recommended guidance map for presence of wetlands. The layer would be available through iMap, Maryland's comprehensive online portal for digital map layers. The layer would also be available to entities managing the Watershed Resources Registry.

- 1.1.2 Seek funding to complete enhanced wetland mapping for entire State.
 - 1.1.3 Seek funding to create and subsequently update a living wetland polygon tool for the wetland guidance map on a regular basis using assessments and field verifications resulting from state agency studies for pre-application information and permit review, and results from jurisdictional determinations for Clean Water Act decisions.
 - 1.1.4 Include mitigation sites on the updated wetland guidance maps. (ongoing)
 - 1.1.5 Make updated wetland guidance maps available to State, federal, and local agencies and the public.
 - 1.1.6 Add updated wetland maps to the screening system for new wetland applications.

Lead Agency: MDE Other Agency: DNR, MDA
 - 1.1.7 Seek funding and improve data layers for streams.
 - 1.1.8 Complete periodic updates of shoreline inventories.
- 1.2 Objective: Improve regulatory efficiency and wetland conservation.
- Rationale: Maryland State agencies constantly strive to implement more efficient and effective regulatory and non-regulatory programs for wetland management.
- Action items:
- 1.2.1 Evaluate regulations to identify areas where requirements result in inefficient permit review and do not advance wetland protection. (in progress). Complete revisions to nontidal wetland mitigation and tidal wetland regulations.
 - 1.2.2 Evaluate potential sites for potential addition or deletion from Nontidal Wetland of Special State Concern list.
 - 1.2.3 Conduct training to State foresters in wetland identification

and selection and review of best management practices for forestry activities in nontidal wetlands. Seek funding as needed for materials to be used in training, and for implementation.

1.2.4 Develop tracking and/or notification system for Special Conditions including marsh maintenance plans, bathymetric surveys, mitigation projects.

1.2.5 Seek funding to expand capability of receiving digital application submissions to include auto-review and reject incomplete forms and submissions prior to distribution to staff.

1.3 Objective: Adopt provisions to improve success of compensatory mitigation and implement compensatory mitigation consistent with EPA/U.S. Army Corps of Engineers federal mitigation rule.

Rationale: In order to implement a State Programmatic General Permit and in-lieu fee program, Maryland's compensatory mitigation requirements must be consistent with federal requirements.

Action items:

1.3.1 Revise mitigation regulations to improve consistency with 2008 federal rule and seek approval of in-lieu fee instrument (in progress, Prospectus submitted and comments received. Draft instrument under development, but pending changes to in-lieu fee rates. Draft regulations in progress.

1.3.2 Remove disincentives to mitigation banking. (in progress)

1.3.3 Develop new tools or adapt existing tools to better predict replacement of lost wetland functions, including functions for fish/wildlife habitat, nutrient processing and sediment retention for water quality; flood attenuation; food chain support; groundwater recharge and discharge.

Grant awarded 2016, and 2018. Work with DNR underway

Lead Agency: MDE. Other Agencies: DNR, NRCS, EPA

Lead Agency (Stream mitigation): IRT. Workgroup led by USACE. Other Agencies: MDE, USFWS, EPA

Lead Agency (Regulatory wetland assessment): USACE. Other Agencies: MDE, DNR, EPA, NRCS

1.4 Objective: Evaluate effectiveness of restoration guidance and practices and improve outreach and education material for improved, consistent design recommendations and considerations.

Rationale: Maryland has established law and regulations designating “living shorelines” as the default preferred option for shoreline stabilization. Since implementation, there has been no comprehensive follow up to determine the success of living shoreline projects and if existing regulations and/or guidance should be revised.

Many stream/wetland restoration projects will be proposed in Maryland to meet requirements of the Chesapeake Bay Watershed Implementation Plans to meet Total Maximum Daily Load (TMDL) requirements for nutrients and sediments. Additional guidance is needed to better ensure that projects provide a net resource benefit.

Action items:

1.4.1 Seek grant to:

- a. Conduct field and geospatial studies of non-structural shoreline stabilization (living shoreline) sites, including long-term stability, resilience to sea level rise and other stressors, and ecological function related to natural vegetated tidal wetlands and their buffers; complete Statewide shoreline inventory update and shoreline stabilization tool developed by VIMS. Status: Underway through 2 grants for 8 counties.
- b. Acquire services of coastal engineer to develop additional guidance, tools, sample plans, and recommendations for evaluation of restoration sites, living shoreline sites, and impacts from other proposed activities.

- c. Attend marine trade shows to conduct outreach on available services, guidance, requirements, and to promote living shoreline designs that reflect existing natural marsh and shoreline composition.
- d. Update living shoreline construction guidance to promote construction methods that minimize disruption of upland buffers when establishing living shorelines.
Agencies: CAC, MDE, DNR
- e. Work with other resource agencies to streamline the review of living shoreline projects in tidal waters.
- f. Conduct outreach and training sessions on new guidance to marine contractors, consultants, and other stakeholders.

1.4.2 Improve the effectiveness and efficiency of the review process for restoration projects in coordination with other resource agencies.

- a. Prioritize review within MDE and DNR for restoration projects, particularly for those projects that are funded by the Chesapeake Bay Trust in order to expedite budget expenditures. Ongoing.
- b. Continue to improve coordination of multiple permit requirements. Develop a coordinated interagency approach on stream and wetland restoration protocols that inform and streamline design, expedite permit review, funding and construction and result in functional uplift for wetland and associated stream resources, including adjacent riparian areas.
- c. Develop guidance to applicants for documenting functional uplift from restoration actions at the project site.
- d. Assist in developing criteria and guidance for qualifying conditions for application of wetland practices receiving credit for nutrient and sediment reduction for the Chesapeake Bay TMDL.

Lead Agency: Chesapeake Bay Program. Other agencies: MDE, DNR, CAC, MDA, USACE

1.5 Objective: Implement new BMP requirements for temporary impacts and expand outreach to promote use.

Rationale: The BMPS have been identified as part of State Wetland Program Development Grant BG 97302704-0, completed in 2013. This project evaluated projects with temporary wetland impacts, primarily for utility line installation of temporary access roads, to determine if the wetland was successfully restored. As a result of the project, new draft BMPs were developed.

Action Items:

1.5.1 Expand training to local jurisdictions, major utilities, and other stakeholders;

1.5.2 Begin maintaining digital records of individual impact sites.

Lead Agency: MDE.

1.6 Objective: Work with U.S. Army Corps of Engineers to revise long form application and information requirements to reduce requests for additional information.

Rationale: Requests for additional information frequently delay application review, project modification, and authorization. Revisions to the form and updated instructions to more clearly describe required information would result in a more efficient review process. In addition, a section for specialized information unique to review of restoration projects would expedite review of beneficial restoration projects.

Action Items: Works with U.S. Army Corps of Engineers to:

1.6.1 Include special section for restoration projects in a revised application. (in progress)

1.6.2 Include more detailed fields and revise instructions for showing proposed impacts. (in progress)

- 1.6.3 Seek funding to establish criteria for digital submission of application and plan information and improve database and screening system to allow for digital submittal and distribution of application information. (in progress)
- Lead Agency: MDE. Other Agencies: MES, USACE, SHA.
- 1.6.4 Create fillable digital joint permit application forms.
- 1.7 Objective: Determine need for additional guidance and standards for identified project types or practices of concern.
- Rationale: New or unforeseen issues often arise which result in the need for additional investigations and new guidance and standards for efficient and consistent regulatory review.
- Action items:
- 1.7.1 Prepare new guidance and standards for wetland type conversion, ponds in forested wetlands; stormwater management activities in wetlands, and waterways; and forestry practices.
- Lead Agency: MDE. Other Agencies: DNR, CAC, TBD, based on topic
- 1.7.2 Create new guidance and review criteria for considering climate change and increased precipitation in regulatory review to evaluate effects on water resources, flooding, living resources and dam safety.
- 1.8 Objective: Improve reporting capability and accuracy for authorized losses and gains.
- Rationale: MDE uses data systems that currently fail to meet demands for complicated data review; processing deadlines; and linking to GIS systems. Improvements to the data management systems are necessary to provide critical information for evaluating MDE program performance.

Action Items:

- 1.8.1 Seek funding to integrate GIS wetland and waterway gain/loss and enterprise permit database.
- 1.8.2 Correct errors in report programming.
- 1.8.3 Update standard operating procedures for data entry and characterization of permanent, temporary, and conversion activities in wetlands.
- 1.8.4 Develop prospectus for future implementation of geospatial analysis of wetland losses and gains using available remote sensing data.
- 1.8.5 Improve reporting capability and tracking of individual water quality certifications and coastal zone consistency determinations.

Lead Agency: MDE

- 1.9 Objective: Continue to provide and receive training in wetland identification and expand training efforts in priority topics; and receive training in special topics to increase expertise.

Rationale: Maryland agencies constantly strive to acquire and use most recent available information to improve program implementation, service to stakeholders, and wetland conservation.

Action items:

- 1.9.1 Provide training on new joint application
- 1.9.2 Seek funding to conduct and receive training on:
 - a. Stream assessment and review of restoration/mitigation projects;
 - b. Technical advances and policy development on mitigation, wetland assessments, site evaluation, remediation, and soils.

Lead Agencies: MDE, USACE, and DNR. Other agencies: MDA, USEPA, USFWS, NRCS.

1.10 Objective: Streamline environmental review coordination between MDE, DNR, and other pertinent agencies.

Rationale: MDE uses environmental GIS data as a screening tool to identify which permit applications should be sent to DNR for additional review and comment related to high value living resource and habitat concerns. Many of these data layers describe ecologically sensitive areas identified by DNR. As additional field surveys and resource assessments are conducted by DNR staff, these data layers become outdated and require updating and distribution to partner agencies.

Action Items: Seek funding to:

1.10.1 Update DNR data layers for ecologically sensitive areas to aid MDE in screening applications and determining which applications are sent to DNR for review. (ongoing)

1.10.2 Develop MDE in-house expertise for improved ecological interpretation in lieu of DNR review of minor projects.

1.10.3 Identify areas or project types which continue to require DNR expertise in providing recommendation in application review.

1.10.4

Adjust screening criteria to improve the selection of projects requiring interagency coordinated review. Examples include:

- a. Prioritize DNR review by project type and location;
- b. Determine area of influence and affected resource for a given permit point.
- c. Refine Use III/IV maps for application screening by identifying stream reaches that have known occurrences of sensitive living resources, such as trout streams, aquatic species of Greatest Conservation Need, coldwater benthic communities and other unique aquatic living resource attributes.
- d. Develop field criteria for MDE reviewers to use in order to forward projects to DNR for living resource and habitat focused reviews
- e. Develop a list of trout/coldwater conservation BMPs to inform permit conditions for MDE to apply during application review in place if individual DNR permit review.
- f. Migrate interagency pre-application screening, permit application and permit review from hardcopy to a digital e-collaboration framework that utilizes geospatial information and on-line review and commenting for more efficient and effective regulatory review.
- g. Conduct cross-training sessions with facilitator among SHA/MDE/DNR/MDA/CAC at regular intervals to ensure interagency staff are aware of new research, existing planning and review tools, regulations and policies.

- h. DNR to provide training to MDE reviewers on use and interpretation of biological resources such as the Natural Areas Inventory.
- i. Conduct training in key wildlife habitats: identification, assessment, BMPs, and opportunities and techniques for enhancement.

Lead Agencies: MDE and DNR. Other agency: CAC

- 1.10.5 Seek funding to develop, in cooperation with the Maryland Environmental Service, U.S. Army Corps of Engineers (USACE), and other resource agencies, an online self-certification and application system (for smaller impact projects) that leverages existing programmatic databases, resource screening tools, and GIS web services to receive applications, notices and processing fees, and to automatically notify staff, commenting agencies, and interested parties.

Lead Agency: MDE. Other agencies: USACE, DNR, SHA

- 1.10.6 Seek funding to:
- a. Test on-line application submittal and online data system.
 - b. Acquire large scale printers to reproduce engineering plans
 - c. Hire personnel or hire a service contract to scan and digitize paper documents and applications from users not using the on-line system.
 - d. Develop and test expansion of system to allow for viewing information and authorizations from U.S. Army Corps of Engineers. Completed.
 - e. Maintain data system after development for sustained operation of viewing applications and authorizations from MDE and USACE.

1.11 Objective: Expand capability of regulatory program to operate remotely outside of traditional office setting.

Rationale: The restrictions on meeting in office and field during restrictions due to coronavirus highlight the need for new procedures to continue to implement the regulatory program.

Action Items:

1.11.1 Acquire tools and supplies for staff to use while teleworking.

1.11.2 Revise regulations to allow for virtual public hearings.

Lead agency: MDE

2. Monitoring and Assessment

MDE was awarded a U.S. Environmental Protection Agency State Wetland Program Development Grant to develop the wetland monitoring strategy. The first years of the grant were devoted to analysis of existing methods, investigations into program improvements, and internal policy discussions, as well as MDE participation in various technical groups. A work group comprised of State agency representatives then met to reach general consensus on a draft classification system, as well as to monitor and assess wetland condition and function. MDE formed a group of diverse stakeholders of federal, State, and local agencies, development, conservation and research entities, to provide comment and assistance in preparing the final strategy. The final strategy was completed in September 2010. Action items in this section include some recommendations named in the final strategy as well as updated actions.

A detailed description of wetland assessments and monitoring may be found on MDE's web page at:

<http://mde.maryland.gov/programs/Water/WetlandsandWaterways/AboutWetlands/Pages/monitoring.aspx>

Current Assessment and Monitoring Efforts

Wetland functional assessments are performed by several federal and State agencies, private consulting firms, and non-profit organizations (watershed groups, land trusts, etc.). Functional assessments are conducted to determine the functions provided by an individual wetland, a specific wetland type, or a comparison of several wetlands. These assessments are often done for the purposes of evaluating existing or restored wetlands, or wetlands proposed for impact. These assessments are also used in developing restoration, conservation, or preservation goals for resource regulation and management, watershed planning, and local planning.

MDE completes informal wetland functional assessments during the permit application review process. These assessments help to evaluate functions that are to be lost, and consist of subjective evaluations based on a reviewer's best professional judgment (BPJ). The assessment parameters include hydrology source, biological factors, habitat, recreational/educational use, water quality, and hydrologic functions. Various sources of information may be used to determine local hydrology, vegetation, soils, drainage basin area, adjacent land use and land cover, and topography. Information sources may include GIS-based information, soil surveys, guidance maps, and information provided by local agencies and landowners. Information collected on impacted wetlands is entered in a reporting form that is completed by the project reviewer when an authorization is issued.

MDE also attempts to complete functional assessments on programmatic mitigation sites, and requires functional assessments on permittee mitigation sites. For projects requiring

permittee mitigation, applicants must demonstrate prior to issuance of an authorization that proposed mitigation measures or sites will replace or surpass the functions lost from the proposed impacts. Additionally, applicants must submit yearly monitoring reports for permittee mitigation sites, which give an indication of the functional performance of the site. Functional assessments required for mitigation sites are not comprehensive, but rather concentrate on some basic indicators of wetland function including depth of/to water, water source, and type and density of vegetation.

Mitigation sites may be required to reach certain threshold measurements of wetland functional indicators, such as the number of woody plants per acre. MDE uses a scoring system combining simple metrics for vegetation, soils, and hydrology, plus some indicators of wetland function. The indicators of function are adapted from MDE's method based on the HGM framework, but tailored to the Piedmont and Coastal Plain of Maryland. The methodology is described in a report entitled "A Method for the Assessment of Wetland Function," and was produced in association with the Fugro East company. This method is intended for use at the landscape level, to aid in planning and evaluation for a given study area for both field and office use (Fugro East, 1995). The Fugro East HGM methodology has already been adapted and used for watershed planning in Montgomery County. Further adaptations of the HGM methodology have been developed for use in the Eastern Coastal Plain, by the Smithsonian Environmental Resource Center, and for use in the Ridge and Valley Region, by Pennsylvania State University.

The Maryland State Highway Administration (MD SHA) conducts formal wetland functional assessments as part of the planning process for most highway projects and to determine wetland mitigation requirements.

More recent evaluations are found in documents used in preparing Maryland's Wetland Monitoring Strategy, funded by BG 973027-03 (2009) and available at:

<http://mde.maryland.gov/programs/Water/WetlandsandWaterways/AboutWetlands/Pages/monitoring.aspx>

Numerous multi-agency efforts are underway to adapt existing methods for wetlands and streams for regulatory purposes, as well as to provide guidance for stream restoration projects with adjacent wetlands.

In 2020, MDE began working with a Chesapeake Conservation Corps intern to evaluate success of living shoreline projects, particularly for habitat.

Goal 1: Develop, update, or recognize tools and methods which will provide critical baseline information on wetland extent, condition, and function to improve wetland management decisions.

- 2.1 Objective: Develop capacity and tools to improve assessment of wetland condition, function, vulnerability to stressors and ecosystem service benefits in order to better inform

regulatory and non-regulatory programs for restoration and preservation.

Rationale: Maryland agencies implement a wide range of programs for wetland management, including regulatory programs for review of activities which may result in wetland loss, restoration programs in degraded resources, and preservation programs to protect vital resources. Tools are needed to better predict outcomes of management actions.

Action items:

2.1.1 Seek grants or other funding to:

- a. Improve and standardize rapid functional assessment for regulatory use, with instructions, indicators and training;
- b. Work with USDA and USGS to test approaches of evaluating wetland hydrology, connectivity, and headwater stream identification using LiDAR and DEMs.
- c. Improve integration of GIS-based regulatory permit data with MDE enterprise TEMPO data system for improved status and trend reporting and spatial analysis of wetland impacts and mitigation.
- d. Develop a method to assess condition and enhancement potential for wetland key wildlife habitats designated in the Maryland State Wildlife Action Plan.
- e. Improve assessments for hydrology needs to establish or re-establish wetlands.
- f. Participate in 2021 NWCA field assessment, pending sufficient funding.
- g. Create unified assessment of stream/wetland complexes for use in permit review.

- h. Apply and refine metrics to economically quantify wetland ecosystem service benefits to be used for evaluating return on investment for voluntary restoration and conservation efforts.
- i. Improve metrics and performance standards for wetland mitigation sites.

Lead Agencies: MDE, USACE, DNR, EPA, USFWS.

2.1.2 Improve integrated management of submerged aquatic vegetation (SAV) and tidal marsh and seek funding to:

- a. Develop or acquire maps showing early season submerged aquatic vegetation for use in regulatory and management programs
- b. Evaluate the long-term effects of living shoreline projects on submerged aquatic vegetation.
- c. Evaluate impact on home values from the construction of living shorelines and hardened shorelines.
- d. Evaluate the impact of docks, piers, and other over-water structures on the various communities of submerged aquatic vegetation in Chesapeake Bay (i.e., freshwater, mesohaline, and polyhaline SAV communities).

2.2 Objective: Improve success of stream restoration projects.

Rationale: Stream restoration is closely associated with restoration and enhancement of adjacent wetlands. Information and guidance is needed to improve success of restoration while limiting unintended consequences and resource tradeoffs.

Action items:

2.2.1: Evaluate and track stream restoration successes and document methods with highest success.

2.2.2: Evaluate crediting assigned as it relates to MS-4 and WIP credits.

Lead agencies: MDE, TBD

3. Restoration and Protection

Maryland has set challenging but achievable goals for wetland restoration and protection in partnership with Virginia, Pennsylvania, West Virginia, Delaware and New York through the Chesapeake Bay Watershed Agreement. The Bay States are working together to create or reestablish 85,000 acres of tidal and non-tidal wetlands, enhance the function of 150,000 acres of degraded wetlands and conserve 225,000 acres of wetlands by the year 2025. This new commitment augments decades of focused effort, regulatory and non-regulatory program development and financial investment by Maryland to restore and protect its wetland resources.

The resources available to achieve the State's goals are limited. It is the State's responsibility to make the best use of these limited resources by

- developing and incorporating new information, science and practices to improve the outcome of restoration and protection efforts,
- removing the barriers that impede achieving the best possible outcomes,
- identifying new approaches and new partnerships,
- providing education and training to improve the technical capacity of practitioners in the public and private sectors,
- nurturing a wetland stewardship ethic among all citizens in the State through outreach and education, and
- understanding and acting upon the multitude of drivers that affect land use change and infrastructure development which ultimately impacts the extent and health of the State's wetland resources

There are numerous prioritization and targeting documents available for use in Maryland, including the:

- Watershed Resources Registry
<https://watershedresourcesregistry.org/states/maryland.html>,
- *Priority Areas for Wetland Restoration, Preservation, and Mitigation*;
<https://mde.maryland.gov/programs/Water/WetlandsandWaterways/AboutWetlands/Pages/priordownloads.aspx>
- *BioNet and Natural Areas Inventory*
https://data.imap.maryland.gov/datasets/ef9a46a5798a452b824ad33dcb9d2572_0
- *Maryland State Wildlife Action Plan*
https://dnr.maryland.gov/wildlife/Pages/plants_wildlife/SWAP_overview.aspx
- *GreenPrint*;
<https://dnr.maryland.gov/land/Pages/Green-Infrastructure-Mapping.aspx>
- *Chesapeake and Atlantic Coastal Bays Trust Fund/SPARROW (Spatially*

References Regression on Watershed attributes) v4 Targeting Priorities
<https://dnr.maryland.gov/ccs/Pages/funding/trust-fund.aspx>
https://www.usgs.gov/mission-areas/water-resources/science/sparrow-modeling-estimating-nutrient-sediment-and-dissolved?qt-science_center_objects=0#qt-science_center_objects

- *Statewide Coastal Resiliency Assessment*

https://dnr.maryland.gov/ccs/Documents/MARCH2016_MDCoastalResiliencyAssessment.pdf

- *Priority Areas for Wetland Restoration, Preservation, and Mitigation in Maryland's Coastal Bays*

<https://mde.maryland.gov/programs/Water/WetlandsandWaterways/AboutWetlands/Pages/prioritizingareas.aspx#maryland>

Wetland restoration, creation, and enhancement is undertaken by multiple State, federal, and local agencies in collaboration with willing landowners. Some of these gains qualify as best management practices contributing toward nutrient and sediment reductions toward the TMDL for Chesapeake Bay, as well as the overall Chesapeake Bay Agreement commitment toward wetland gains. During the period between 2016-2019, there were reported gains of 895 acres of wetlands which were re-established, 83 acres of wetlands which were created, and 3,262 acres of wetlands which were enhanced. From 1998-2019, there were reported gains of 215,935 acres of wetlands restored, created, or enhanced in Maryland.

The Maryland Department of Natural Resources has developed a new conservation tool to identify opportunities for the beneficial use of clean dredged sediments. Beneficial Use – Identifying Locations for Dredge (BUILD) is a mapping tool that will support the state's Chesapeake Bay restoration efforts, protect infrastructure and investment, and enhance coastal resiliency. BUILD will assist governmental and non-governmental entities to synchronize the use of dredged material from navigation channels with projects that reduce flooding and storm risk impacts. Planners and engineers can save on costs that would otherwise be incurred to transport dredged material to an upland placement site or to bring fill material to a restoration site. BUILD provides access to various dredging and restoration datasets, including navigational channel depth surveys, potential restoration sites, upcoming navigational improvement projects and the state's Wetlands and Waterways permit layer. More information is available at <https://dnr.maryland.gov/ccs/Pages/beneficial-use.aspx>

The Maryland Department of Natural Resources launched an innovative new tool (May 2018) to evaluate the conservation benefits and ecosystem “value” of every parcel of land across the state. The Parcel Evaluation Tool was designed to identify and prioritize the conservation and protection of ecologically important, sensitive, and valuable land and watershed resources in Maryland for use by the department, land conservation organizations and trusts, local and state

planners, and individual property owners. The do-it-yourself tool incorporates the department's latest mapping technologies and scoring formulas to determine areas of high-ecological and natural resources value. Users can create a Conservation Benefits and Ecosystem Service Assessment Report Card, which analyzes and rates individual parcels on a number of factors, including coastal resiliency, connectivity, habitat and more.

The National Oceanic and Atmospheric Administration (NOAA) Ecological Effects of Sea Level Rise (EESLR) program awarded \$250,000 (October 2019) to the Maryland Department of Natural Resources, George Mason University (GMU), and The Nature Conservancy to increase our understanding of the benefits of natural features, like marshes and aquatic vegetation, in reducing the effects of sea level rise, flooding, and storms. EESLR projects explore the vulnerability of natural ecosystems, evaluate the potential for natural structures to reduce coastal inundation, and develop best practices for the inclusion of ecosystems in coastal protection strategies.

The objectives and action items detailed below provide a pathway towards continual improvement and increased effectiveness in the State's efforts to restore and protect its wetland resources.

Goal: Ensure restoration and preservation efforts provide the greatest water quality, native habitat and associated ecosystem service benefits possible for the financial resources expended, today and in the future, through science-guided practices and priorities, ongoing stewardship and effective partnerships.

3.1 Objective: Update priority areas and management recommendations based on new relevant information; ensure regulatory measures support sound restoration and protection priorities which comply with regulatory standards.

Rationale: Maryland has numerous prioritization and targeting documents, described above. These elements form part of the comprehensive planning framework in MDE's prospectus to operate an in-lieu fee program consistent with the 2008 federal mitigation rule. Periodic updates reflecting new information and priorities are necessary in planning restoration, preservation, and mitigation projects.

Action Items:

3.1.1 Prioritize restoration and conservation projects that connect and/or preserve habitat corridors for plant and animal migration consistent with BioNet and Maryland State Wildlife Action Plan.

- a. Complete forest patch analysis that can be added to other restoration and conservation tools.

Agencies: CAC and DNR

- 3.1.2 Collaborate on development and distribution of guidance for restoration projects.
- 3.1.3 Develop recommendations for enhancement of key wildlife habitats that support priority Maryland State Wildlife Action Plan conservation actions.

Lead Agency: DNR and MDE. Other Agency: MDA, CAC, TBD

- 3.2 Objective: Develop a coordinated interagency approach on stream and wetland restoration protocols that inform and streamline design, permit review, funding and construction and result in functional uplift for wetland and associated stream resources.

Action Items:

- 3.2.1 Identify factors which delay approval and determine approaches to expedite permit review of restoration projects.
- 3.2.2 Promote floodplain reconnection projects for water quality and habitat connectivity benefits, while maintaining or expanding existing riparian or wetland vegetation.

Lead Agencies: MDE and DNR. Other Agencies: MDA, TBD.

- 3.2.3 Seek funding to develop guidance for balancing living shoreline projects with submerged aquatic vegetation restoration and protection.

Lead agencies: MDE, DNR, CAC. Federal agencies TBD.

- 3.3 Objective: Evaluate sites for potential addition or deletion to designated nontidal wetlands of special State concern.

Rationale: No comprehensive effort to update the list of designated nontidal wetlands of special State concern has been completed since originally developed in 1989. Changes to the list are overdue for identifying additions and deletions for improved conservation of these areas.

Action items:

3.3.1 MDE and DNR will collaborate on a review of supporting documentation of suggested deletions and additions.

3.3.2 Update list with addition of new qualifying areas and removal of areas that no longer meet criteria for designation.

Lead Agencies: DNR and MDE. Other Agencies: MDA.

3.4 Objective: Develop climate change adaptation criteria to guide restoration, preservation and permit review efforts where appropriate for wetland, waterway, and floodplain projects and activities subject to extreme weather events, sea level rise, coastal wetland migration corridors, inland flooding hotspots, climatic vegetation shifts, etc.

Rationale: Natural functions of wetlands and floodplains in reducing natural hazards from climate change and more frequent extreme weather events can be further explored and utilized. Vulnerability of activities in these regulated areas also needs additional consideration.

Action Items: Seek funding to:

3.4.1 Develop criteria for extreme event, sea level rise and climate change adaptation for use in review of wetland or waterway permits. This may include modifications to standard structural components as well as modifications to typical species lists for living shorelines.

3.4.2 Develop science based criteria to evaluate the adequacy of climate resilient practices used by State agencies to address coastal hazards, extreme weather events, and sea level rise,

including evaluating efforts at minimizing impacts to wetland migration corridors. In progress.

Lead Agencies: CAC, DNR. Other Agencies: MDE, TBD

3.5 Objective: Continue to achieve and record gains associated with wetland restoration, creation, and enhancement projects.

Rationale: Wetland acreage and functional gains are goals for various programs and requirements, including Watershed Implementation plans for TMDLs, Chesapeake Bay Agreement wetland gains, State “no net loss” and net gain in acreage and function. Accurate records are needed to track progress of wetland gains.

Action item: Ongoing

3.5.1 Continue to check records for accuracy.

Lead Agency: MDE. Other Agencies: DNR, MDA, SHA.

3.6 Objective: Conserve high value wetlands and associated landscape connectivity through protection opportunities provided by land conservation programs and infrastructure, land use, energy and transportation planning and development.

Rationale: Maryland agencies support conservation of high value wetlands and partnership efforts, and must rely on and promote use of most appropriate tools for setting priority management actions.

Action Items:

3.6.1 Support and participate in the Greater Baltimore Wilderness Coalition which is a coalition of public, private, and nonprofit organizations that envisions a future where accessible interconnected and healthy ecosystems contribute to economic vitality, resilience, and quality of life for all the region’s residents and visitors [<http://www.baltimorewilderness.org/>] (in progress)
The Department of Natural Resources continues to serve as Co-Chair. In progress.

Lead Agency: DNR

3.6.2 Prioritize conservation decisions to increase habitat connectivity to protect wildlife corridors (gene pool) and, in coastal areas, wetland migration corridors.

3.6.3 Promote the use of planning tools, such as the Watershed Resources Registry, BioNet, GreenPrint, and others, to avoid and minimize impacts to wetlands and to direct mitigation to areas that already have been identified as having significant natural resources

Lead Agency: DNR. Other Agencies: MDE, SHA, MDA, CAC, TBD.

3.7 Objective: Tailor preservation and restoration management goals specific to individual wetland sites.

Rationale: Wetland conservation actions are often site specific, taking into account landscape, geology, soils, hydrology, and plant communities. Sites of known high resource value are best managed after individual evaluation of their conditions, followed by specific management recommendations to maintain or increase the wetland's high resource value.

Action Item:

3.7.1 Seek funding to prepare new or updated management recommendations for nontidal wetlands of special State concern and other wetlands on State lands, incorporating recommendations for high priority wetlands included in the Maryland Natural Areas Inventory. Status: Some areas completed or in progress.

Lead Agency: DNR.

4. Wetland Water Quality Standards

As “waters of the United States,” wetlands must be managed to protect, restore, and maintain the chemical, physical, and biological integrity of the Nation’s waters. States must now implement a monitoring program to report on how their waters meet the chemical, physical, and biological integrity parameters. This is accomplished by the formal adoption of State water quality standards and structuring the monitoring program to measure water parameters against the established standards.

Water quality standards consist of three parts: 1) designated uses of the waters of the State; 2) narrative/numeric criteria to protect the designated uses; and 3) an antidegradation policy. Wetlands in Maryland are waters of the State, and are subject to the same water quality requirements as other waters. However, wetlands differ from traditional waters in that wetlands contain features more indicative of uplands. Existing water quality standards are often not appropriate given the unique characteristics of wetlands. For example, applying the pH numeric water quality criteria of 6.5 – 8.5 to a wetland bog that naturally maintains a more acidic condition is not appropriate. In developing its wetland monitoring strategy, MDE collected information from 11 other States that have, at a minimum, formally adopted designated uses for wetlands. Some States also have narrative and numeric criteria and antidegradation policies. State language that was evaluated is from Massachusetts, Pennsylvania, North Carolina, Minnesota, Ohio, Wisconsin, Iowa, Nebraska, Wyoming, California, and Washington. The Department of the Environment (MDE) prepared conceptual draft water quality standards that are specific to wetlands as a grant deliverable under U.S. Environmental Protection Agency Performance Partnership Grant BG 973027-3.

The goals of establishing water quality standards for wetlands are stated in the conceptual draft to:

- 1) Maintain the defining characteristics of wetlands; and
- 2) Where practicable, protect and enhance the chemical, physical, and biological conditions of wetlands and the ability of wetlands to provide various wetland, “ecosystem,” or watershed functions.

Goal: Determine whether or not adoption of wetland water quality standards would enhance wetland protection and management.

4.1 Objective: Identify measures and information needed to determine whether or not wetland water quality standards would advance wetland protection and management.

Rationale: Substantial additional data would be needed if MDE were

to develop water quality standard specific to wetlands.

Action items: No Action Taken

- 4.1.1 Seek funding to develop and test protocol for identifying existing functions and ecosystem services of wetlands that could aid in identifying potential designated uses and associated components of water quality standards in the context of the Clean Water Act.
- 4.1.2 MDE and DNR will seek funding to investigate integrated monitoring of wetlands with monitoring of other waters, such as the Maryland Biological Stream Survey.
- 4.1.3 MDE and DNR will seek funding to prepare a list of potential long-term, fixed station study sites on public land or lands accessible for long-term research. Fixed station sites on public or accessible private land may offer a more cost effective approach, and potentially better long-term trend information for integrated assessments required under the Clean Water Act.

Lead Agencies: MDE and DNR.

Goal: Improve process for water quality certification reviews.

4.2 Objective: Revise procedures for review activities requiring water quality certification to comply with federal requirements and ensure that water quality standards are met.

Rationale: Federal procedures and requirements for water quality certifications have changes. New State procedures are required to meet federal requirements.

Action Items:

4.2.1 MDE will update regulations to:

- a. Reflect changes in notice requirements to allow for virtual public hearings.
- b. Update list of information needed to review projects for compliance with water quality standards.

4.2.2 MDE will train staff in new procedures and review requirements.

4.2.3 MDE will update database to track projects requiring individual water quality certifications to meet deadlines for response..

Wetland Program Plan Implementation

- Convene interagency meetings to track progress, refine goals/objectives/tasks and solidify interagency working relationships. Meetings will be held at least annually and otherwise as needed expeditiously complete action items.
- Develop an interagency plan and set of priorities for seeking implementation funds from EPA and other funding agencies.
- Coordinate to record progress and tasks for reporting to EPA and other stakeholders.

Schedule

ACTION ITEM NUMBER	ACTION ITEM	2015-2020 status	2021	2022	2023	2024	2025
	REGULATORY						
1.1.1	ESTABLISH A COMMON, RECOMMENDED WETLAND GUIDANCE MAP	No action	X	X	X		
1.1.2	SEEK FUNDING TO COMPLETE ENHANCED WETLAND MAPPING FOR ENTIRE STATE	No action	X	X	X	X	X
1.1.3	SEEK FUNDING TO CREATE AND SUBSEQUENTLY UPDATE A LIVING WETLAND POLYGON TOOL	No recent action	X	X	X	X	X
1.1.4	INCLUDE MITIGATION SITES ON THE UPDATED WETLAND GUIDANCE	Ongoing effort	X	X	X	X	X
1.1.5	MAKE UPDATED WETLAND GUIDANCE MAPS AVAILABLE TO STATE, FEDERAL, AND LOCAL AGENCIES AND THE PUBLIC	No action	X	X			
1.1.6	SEEK FUNDING TO ESTABLISH CRITERIA FOR DIGITAL SUBMISSION OF APPLICATION AND PLAN INFORMATION AND IMPROVE DATABASE AND SCREENING SYSTEM TO ALLOW FOR DIGITAL SUBMITTAL AND DISTRIBUTION OF APPLICATION INFORMATION.	In progress, in test phase with select government agencies	X	X	X		
1.1.7	SEEK FUNDING AND IMPROVE DATA LAYERS OF STREAMS.	Some work in progress, updated coldwater trout streams layer completed	X	X	X	X	X
1.1.8	CONDUCT PERIODIC UPDATES OF SHORELINE INVENTORIES	In progress, CAC has updated shoreline data for most of the coastal counties generated by Salisbury University, additional work by MDE under MOU with VIMS for 8 counties	X	X	X	X	X

1.2.1	EVALUATE REGULATIONS TO IDENTIFY AREAS OF WHERE REQUIREMENTS RESULT IN INEFFICIENT PERMIT REVIEW AND DO NOT ADVANCE WETLAND PROTECTION	In progress, Draft changes to nontidal wetland mitigation are in progress. Changes to tidal wetland regulations are in early stages of draft revisions	X	X	X	X	X
1.2.2	EVALUATE POTENTIAL SITES FOR POTENTIAL ADDITION OR DELETION FROM NONTIDAL WETLAND OF SPECIAL STATE CONCERN.	Ongoing site evaluation, no recent regulatory action	X	X	X	X	X
1.2.2	Conduct training to State foresters in wetland identification and selection and review of best management practices for forestry activities in nontidal wetlands. Seek funding as needed for materials to be used in training, and for implementation	Completed initial training in 2018, ongoing effort	X	X	X		
1.2.3	Develop tracking and/or notification system for Special Conditions including marsh maintenance plans, bathymetric surveys, mitigation projects,	New for 2021-224 cycle; needs funding,	X	X	X	X	X
1.2.4	Seek funding to expand capability of receiving digital application submissions to include auto-review and reject incomplete forms and submissions prior to distribution to staff.	Needs funding; New for 2021-2024 cycle	X	X	X	X	X
1.3.1	SEEK APPROVAL OF MARYLAND NONTIDAL AND TIDAL WETLAND COMPENSATION FUND PROGRAMS AS IN-LIEU FEE MITIGATION OPTIONS CONSISTENT WITH FEDERAL RULE	PENDING REGULATION CHANGES; draft regulations under review	X	X			
1.3.2	INVESTIGATE MEASURES TO REMOVE DISINCENTIVES TO MITIGATION BANKING	IN PROGRESS WITH DRAFT REGULATIONS	X	X			
1.3.3	DEVELOP NEW TOOLS OR ADAPT EXISTING TOOLS TO BETTER PREDICT REPLACEMENT OF LOST WETLAND FUNCTIONS	IN PROGRESS. Grant awarded 2016, and 2018. Work with DNR underway; test phase for	X	X	X	X	X

		assessment; added participants					
1.3.4	INVESTIGATE ADDITIONAL PARTNERSHIPS TO EXPEDITE ACQUISITION OR PERMISSIONS TO SUCCESSFULLY CONSTRUCT MITIGATION SITES USING IN LIEU FEE FUNDS.	Complete; PARTNERSHIP WITH CHESAPEAKE BAY TRUST					
1.4.1	SEEK GRANT TO CONDUCT FIELD STUDY OF SHORELINE STABILIZATION SITES; UPDATE GUIDANCE, CONDUCT TRAINING	<p>1.4.1a: Some field work planned with Chesapeake Bay Trust intern. Statewide shoreline inventory update and shoreline stabilization tool developed by VIMS. Status: Underway through 2 grants for 8 counties from grants awarded 2018 and 2020; additional work by CAC</p> <p>1.4.1b: Funding requested, proposal rejected in 2016.</p> <p>1.4.1c: Tasks in 2018 and 2020 grant awards, Also carried out by CAC</p> <p>1.4.1d: Added agencies</p> <p>1.4.1e: Task in 2018 and 2020 grant award. Tidal regulation changes in early development</p>	X	X	X	X	X

		1.4.1f: CAC currently conducts training to marine contractors in conjunction with MDE, DNR could be included as well.) Task in 2018-2019 and 2020 awards.					
1.4.2	EVALUATE TOPICS FOR STREAMLINING REVIEW OF RESTORATION PROJECTS AND CONVENE AN INTERAGENCY WORKGROUP TO IDENTIFY APPROACHES FOR STREAMLINING RESTORATION, PARTICULARLY FOR THOSE TOPICS THAT REQUIRE MULTIPLE AGENCY INTEGRATION AND COLLABORATION	1.4.2b: Completed, now ongoing effort. Expanded to include riparian areas 1.4.2c: An assessment of current condition will be part of restoration grant guidance. First version completed. Updated guidance undergoing review through Chesapeake Bay Program. Added participating agencies	X	X		X	
1.5.1	EXPAND TRAINING FOR RESTORATION OF TEMPORARY IMPACTS TO LOCAL JURISDICTIONS, MAJOR UTILITIES, AND OTHER STAKEHOLDERS	No action	X	X			
1.5.2	BEGIN MAINTAINING DIGITAL RECORDS OF INDIVIDUAL IMPACT SITES	NEEDS FUNDING; NO ACTION	X	X	X	X	
1.6.1	INCLUDE SPECIAL SECTION FOR RESTORATION PROJECTS IN A REVISED APPLICATION	IN PROGRESS; revised JPA under development between MDE/USACE	X				

1.6.2	INCLUDE MORE DETAILED FIELDS IN JOINT APPLICATION AND REVISE INSTRUCTIONS FOR SHOWING PROPOSED IMPACTS	IN PROGRESS; revised JPA under development between MDE/USACE	X					
1.6.3	SEEK FUNDING TO ESTABLISH CRITERIA FOR DIGITAL SUBMISSION OF APPLICATION AND PLAN INFORMATION AND IMPROVE DATABASE AND SCREENING SYSTEM TO ALLOW FOR DIGITAL SUBMITTAL AND DISTRIBUTION OF APPLICATION INFORMATION.	In test phase with government applicants	X	X	X	X		
1.6.4	CREATE FILLABLE DIGITAL JPA FORMS	Completed for current form, planned for future revised form	X					

1.7.1	PREPARE NEW GUIDANCE AND STANDARDS FOR WETLAND TYPE CONVERSION, PONDS IN FORESTED WETLANDS; STORMWATER MANAGEMENT ACTIVITIES IN WETLANDS, AND WATERWAYS; AND FORESTRY PRACTICES	No action	X	X				
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1.7.2	Create new guidance and review criteria for considering climate change and increased precipitation in regulatory review to evaluate effects on water resources, flooding, living resources and dam safety.	Preliminary discussion, Needs funding. Grant proposal submitted and rejected 2020.	X	X	X			
1.8.1	SEEK FUNDING TO INTEGRATE GIS WETLAND AND WATERWAY GAIN/LOSS AND ENTERPRISE PERMIT DATABASE	Needs funding No recent action		X	X	X	X	
1.8.2	CORRECT ERRORS IN REPORT PROGRAMMING	In progress by OIMT/contractors	X	X				
1.8.3	UPDATE STANDARD OPERATING PROCEDURES FOR DATA ENTRY AND CHARACTERIZATION OF PERMANENT, TEMPORARY, AND CONVERSION ACTIVITIES IN WETLANDS	No action	X	X				
1.8.4	Develop prospectus for future implementation of geospatial analysis of wetland losses and gains using available remote sensing data.	No recent action			X	X		

1.8.5	Improve reporting and tracking capability of individual water quality certifications and coastal zone consistency determinations.	New for 2021-2024 cycle Basic data entry capability completed, needs report capability, will be also revised in new agency database	X	X			
1.9.1	PROVIDE TRAINING ON NEW JOINT APPLICATION	Pending completion of new application form	X	X			
1.9.2	SEEK FUNDING TO CONDUCT AND RECEIVE TRAINING ON SPECIAL TECHNICAL TOPICS FOR ASSESSMENT AND CONSTRUCTION OF WETLANDS	In progress, participate in informational webinars by Assoc. of State Wetland Managers	X	X	X	X	X
1.10.1	SEEK FUNDING TO UPDATE DNR DATA LAYERS FOR ECOLOGICALLY SENSITIVE AREAS TO AID MDE IN SCREENING APPLICATIONS AND DETERMINING WHICH APPLICATIONS ARE SENT TO DNR FOR REVIEW	COMPLETED FOR COLDWATER RESOURCES. ONGOING FOR RARE SPECIES	X	X	X		
1.10.2	SEEK FUNDING TO DEVELOP MDE IN-HOUSE EXPERTISE FOR IMPROVED ECOLOGICAL INTERPRETATION IN LIEU OF DNR REVIEW OF MINOR PROJECTS	<u>In progress</u> <u>Using updated DNR coldwater fisheries data, MDE/DNR have agreed to reducing distribution of applications to DNR based upon actual presence of coldwater species.</u>	X	X			
1.10.3	SEEK FUNDING TO IDENTIFY AREAS OR PROJECT TYPES WHICH CONTINUE TO REQUIRE DNR EXPERTISE IN PROVIDING RECOMMENDATION IN APPLICATION REVIEW	In progress, discussions part of database e-collaboration improvements, needs additional funding	X	X			

1.10.4	SEEK FUNDING TO ADJUST SCREENING CRITERIA TO IMPROVE THE SELECTION OF PROJECTS REQUIRING INTERAGENCY COORDINATED REVIEW.	In progress via e-collaboration effort; needs funding	X	X			
1.10.5	Seek funding to develop, in cooperation with the Maryland Environmental Service, U.S. Army Corps of Engineers (USACE), and other resource agencies, an online self-certification and application system that leverages existing programmatic databases, resource screening tools, and GIS web services to receive applications, notices and processing fees, and to automatically notify staff, commenting agencies, and interested parties.	Additional funding needed for enhancements	X	X	X		
1.10.6	Seek funding to: Test on-line application submittal and online data system; Acquire large scale printers to reproduce engineering plans; Hire personnel or hire a service contract to scan and digitize paper documents and applications from users not using the on-line system; Develop and test expansion of system to allow for viewing information and authorizations from U.S. Army Corps of Engineers (USACE); Maintain data system after development for sustained operation of viewing applications and authorizations from MDE and USACE. Status: In progress	Tasks in progress for online data system; other tasks need funding	X	X	X	X	X
1.11.1	Acquire tools and supplies for staff to use while teleworking	New for 2021-2024 cycle	X	X			
1.11.2	Revise regulations to allow for virtual public hearings	New for 2021-2024 cycle Statutory changes submitted 2020	X				

ACTION ITEM NUMBER	ACTION ITEM	2015-2020 status	2021	2022	2023	2024	2025
	MONITORING AND ASSESSMENT						
2.1.1	SEEK FUNDING TO DEVELOP OR ADAPT ASSESSMENT METHODS FOR WETLAND FUNCTIONAL AND CONDITION ASSESSMENTS; RESTORATION NEEDS; UNIFIED STREAM/WETLAND ASSESSMENT; IMPROVE METRICS AND PERFORMANCE STANDARDS FOR MITIGATION SITES	IN PROGRESS Completed 2.1.1e participation in 2016 NWCA assessment	X	X	X	X	

		Metrics for mitigation sites new for 2021-2024 cycle					
2.1.2	Improve integrated management of submerged aquatic vegetation (SAV) and tidal marsh; seek funding for mapping, guidance, long-term effects of living shorelines and over water structures on SAV	New for 2021 - 2024 cycle	X	X	X	X	X
2.2.1	Evaluate and track stream restoration successes and document methods with highest success	New for 2021-2024 cycle	X	X	X	X	X
2.2.2	Evaluate crediting as it relates to MS-4 and WIP credits	New for 2021-2024 cycle	X	X	X	X	X

ACTION ITEM NUMBER	ACTION ITEM	2015-2020 status	2021	2022	2023	2024	2025
	RESTORATION AND PROTECTION						
3.1.1	PRIORITIZE RESTORATION AND CONSERVATION PROJECTS THAT CONNECT AND/OR PRESERVE HABITAT CORRIDORS FOR PLANT AND ANIMAL MIGRATION CONSISTENT WITH BIONET AND MARYLAND STATE WILDLIFE ACTION PLAN	IN PROGRESS via 2016 and 2018 EPA grants; assessment undergoing field testing	X	X	X	X	X
3.1.2	COLLABORATE ON DEVELOPMENT AND DISTRIBUTION OF GUIDANCE FOR RESTORATION PROJECTS	IN PROGRESS; draft guidance under development	X	X	X	X	
3.1.3	DEVELOP RECOMMENDATIONS FOR ENHANCEMENT OF KEY WILDLIFE HABITATS THAT SUPPORT PRIORITY MARYLAND STATE WILDLIFE ACTION PLAN CONSERVATION ACTIONS	IN PROGRESS, draft guidance under review and testing	X	X	X	X	
3.2.1	DETERMINE APPROACHES TO EXPEDITE PERMIT REVIEW OF RESTORATION PROJECTS	IN PROGRESS; New survey underway through Chesapeake Bay Program in 2020 for stream restoration	X	X			
3.2.2	PROMOTE FLOODPLAIN RECONNECTION PROJECTS FOR WATER QUALITY AND HABITAT CONNECTIVITY BENEFITS, WHILE MAINTAINING OR EXPANDING EXISTING RIPARIAN OR WETLAND VEGETATION.	IN PROGRESS, New crediting protocols for floodplain reconnection completed.	X	X	X	X	X

3.2.3	Seek funding to develop guidance for balancing living shoreline projects with submerged aquatic vegetation restoration and protection.	New for 2021-2024 cycle	X	X	X	X	X
3.3.1	MDE AND DNR WILL COLLABORATE ON A REVIEW OF SUPPORTING DOCUMENTATION OF SUGGESTED DELETIONS AND ADDITIONS TO THE DESIGNATED LIST OF NONTIDAL WETLANDS OF SPECIAL STATE CONCERN	NO RECENT ACTION	X	X		X	
3.3.2	UPDATE LIST WITH ADDITION OF NEW QUALIFYING AREAS AND REMOVAL OF AREAS THAT NO LONGER MEET CRITERIA FOR DESIGNATION OF NONTIDAL WETLANDS OF SPECIAL STATE CONCERN	NO RECENT ACTION		X	X	X	X
3.4.1	Develop climate change adaptation criteria to guide restoration, preservation and permit review efforts where appropriate for wetland, waterway, and floodplain projects and activities subject to extreme weather events, sea level rise, coastal wetland migration corridors, inland flooding hotspots, climatic vegetation shifts, etc.	Some early discussion; needs additional funding	X	X	X	X	X
3.4.2	DEVELOP SCIENCE BASED CRITERIA TO EVALUATE THE ADEQUACY OF CLIMATE RESILIENT PRACTICES USED BY STATE AGENCIES TO ADDRESS COASTAL HAZARDS, EXTREME WEATHER EVENTS, AND SEA LEVEL RISE, INCLUDING EVALUATING EFFORTS AT MINIMIZING IMPACTS TO WETLAND MIGRATION CORRIDORS.	Some early discussion; needs additional funding	X	X	X	X	X
3.5.1	CONTINUE TO CHECK RECORDS ON WETLAND RESTORATION, CREATION, AND ENHANCEMENT FOR ACCURACY	ONGOING ANNUAL TASK	X	X	X	X	X
3.6.1	SUPPORT AND PARTICIPATE IN THE GREATER BALTIMORE WILDERNESS COALITION	First phase completed, now ONGOING	X	X			
3.6.2	PRIORITIZE CONSERVATION DECISIONS TO INCREASE HABITAT CONNECTIVITY TO PROTECT WILDLIFE CORRIDORS (GENE POOL) AND, IN COASTAL AREAS, WETLAND MIGRATION CORRIDORS	Ongoing through use of Wetland Adaptation Areas (wetland migration corridors mapped through the Sea Level Affecting Marshes Model (SLAMM) as a conservation scoring criteria to inform expenditure of Maryland's Program Open	X	X	X	X	X

		Space land conservation funds.					
3.6.3	PROMOTE THE USE OF PLANNING TOOLS, SUCH AS THE WATERSHED RESOURCES REGISTRY, BIO.NET, GREENPRINT, AND OTHERS, TO AVOID AND MINIMIZE IMPACTS TO WETLANDS	ONGOING, used in assessments being tested	X	X	X	X	X
3.7.1	SEEK FUNDING TO PREPARE NEW OR UPDATED MANAGEMENT RECOMMENDATIONS FOR NONTIDAL WETLANDS OF SPECIAL STATE CONCERN AND OTHER WETLANDS ON STATE LANDS, INCORPORATING RECOMMENDATIONS FOR HIGH PRIORITY WETLANDS INCLUDED IN THE MARYLAND NATURAL AREAS INVENTORY.	Natural Areas Inventory Project has been completed, with document preparation by county completed or in progress	X	X	X	X	X

ACTION ITEM NUMBER	ACTION ITEM	2020	2021	2022	2023	2024	2025
	WETLAND WATER QUALITY STANDARDS						
4.1.1	SEEK FUNDING TO DEVELOP AND TEST PROTOCOL FOR IDENTIFYING EXISTING FUNCTIONS AND ECOSYSTEM SERVICES OF WETLANDS THAT COULD AID IN IDENTIFYING POTENTIAL DESIGNATED USES AND ASSOCIATED COMPONENTS OF WATER QUALITY STANDARDS IN THE CONTEXT OF THE CLEAN WATER ACT.	NO ACTION				X	X
4.1.2	MDE AND DNR WILL SEEK FUNDING TO INVESTIGATE INTEGRATED MONITORING OF WETLANDS WITH MONITORING OF OTHER WATERS, SUCH AS THE MARYLAND BIOLOGICAL STREAM SURVEY.	NO ACTION			X	X	X
4.1.3	MDE AND DNR WILL SEEK FUNDING TO PREPARE A LIST OF POTENTIAL LONG-TERM, FIXED STATION STUDY SITES ON PUBLIC LAND OR LANDS ACCESSIBLE FOR LONG-TERM RESEARCH	NO ACTION		X	X		

4.2.1	UPDATE REGULATIONS FOR HEARINGS AND INFORMATION REQUIREMENTS STATUS:	New for 2021-2024 cycle; statutory changes submitted 2020	X					
4.2.2	CONDUCT TRAINING FOR STAFF ON WATER QUALITY STANDARDS AND REVIEW PROCESS	New for 2021-2024 cycle; In progress with preliminary work on conditions and necessity	X					
4.2.3	UPDATE DATABASE FOR TRACKING OF INDIVIDUAL WATER QUALITY CERTIFICATIONS	New for 2021-2024 cycle; In progress with Database entry completed; reporting capability needed	X					

Glossary of Terms

“Conservation” refers to the comprehensive management and use of wetlands to meet various resource needs.

“Nontidal Wetlands of Special State Concern” means areas designated based on the criteria below as having exceptional ecological or educational value of Statewide significance:

(1) The following criteria shall be used by the Department to designate nontidal wetlands of special State concern that:

(a) Provide habitat or ecologically important buffers for the habitat of plant or animal species:

(i) Listed as endangered or threatened by the U.S. Fish and Wildlife Service;

(ii) Listed as endangered or threatened, or species listed as in need of conservation by the Department of Natural Resources; or

(iii) Considered to be a candidate for listing by the U.S. Fish and Wildlife Service, or considered to be locally unusual or rare by the Department of Natural Resources; or

(b) Are unique natural areas or contain ecologically unusual natural communities.

(2) Nontidal wetlands of special State concern are designated in COMAR 26.23.06.01.

References:

Fugro East, Inc. 1995. *A Method for the Assessment of Wetland Function*. Prepared for Maryland Department of the Environment. Funded by U.S. Environmental Protection Agency State Wetland Program Development Grant CD 003617-01-2.

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APPENDIX A

(FR: Maryland State Wetland Conservation Plan, 2003)

WETLANDS INVENTORY AND BASELINE

Regional Description of Maryland's Wetlands

General Description

In total surface area, Maryland is the eighth smallest state in the nation. The State comprises 23 counties, the two largest being Frederick and Garrett Counties and the two smallest being Calvert and Howard Counties. Baltimore is an independent city occupying 80 square miles (Tiner and Burke, 1995). Maryland contains portions of two major U.S. ecoregions; the eastern portion of the state, roughly from Baltimore and Montgomery Counties east, falls within the Southeastern Mixed Forest, while the western section of the state is in the Appalachian Oak Forest (Bailey, 1978). Maryland also includes the majority of the Chesapeake Bay, which has a dominant influence on the region's climate, biological resources, and economy (Tiner and Burke, 1995).

Maryland's 9,837 square miles of land area lie in five distinct physiographic provinces, making it one of the most geologically and hydrologically diverse states in the northeastern United States. The five physiographic provinces, from east to west, include: the Coastal Plain, the Piedmont, the Blue Ridge, the Valley and Ridge and the Appalachian Plateau (Figure A-1).

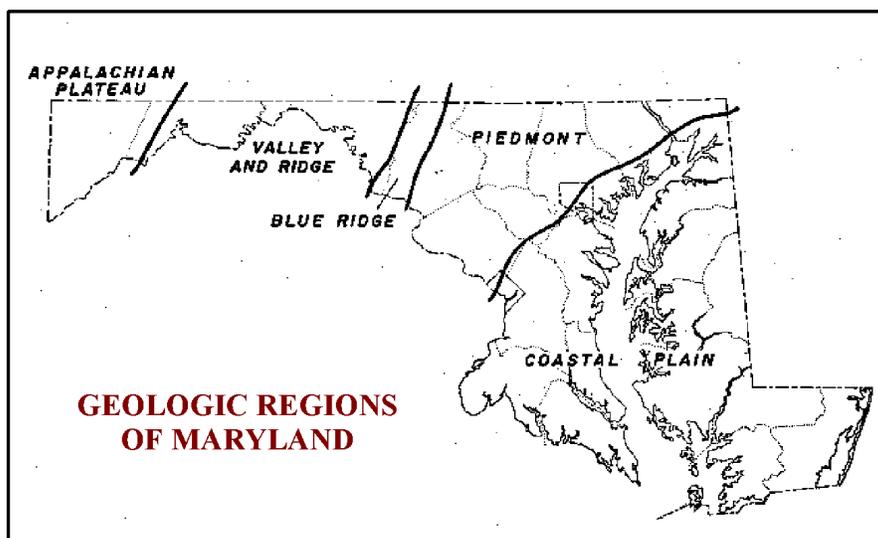


Figure A-1. Distribution of the five physiographic provinces of Maryland: Appalachian Plateau Province, Valley and Ridge Province, Blue Ridge Province, Piedmont Province and Coastal Plain Province (Tiner and Burke, 1995).

The topography of Maryland is highly variable; the land surface elevation increases gradually from the Atlantic Ocean across the Coastal Plain, and then increases rapidly over the Piedmont Province and the ridges of the Appalachian Plateau, culminating in the highlands of the Allegheny Plateau in Garret County. The boundary between the Piedmont and Coastal Plain Provinces is commonly known as the 'Fall Line,' because of the dense concentration of falls

throughout the area, and is characterized by rapid changes in geologic, topographic and hydrologic features.

Definitions of Wetlands

There are many definitions of wetlands that have been developed by different groups, for different purposes. Like most ecological systems they may be characterized in different ways, depending on whether one is looking at habitats, natural processes, and other factors. The challenge for governmental organizations has been to develop definitions that not only describe what a wetland is, but to do so in a way that can be used to determine whether or not a given area is wetland, and where a wetland “boundary” begins and ends. The ability for a definition to allow one to delineate or put a “line” around a wetland, becomes important when legal issues arise.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service developed a scientifically based definition of the Nation’s wetlands for resource management purposes and to help ensure accurate and consistent wetland determinations. “Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes:

- 1) At least periodically, the land supports predominantly hydrophytes
- 2) The substrate is predominantly undrained hydric soil
- 3) The substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of the year.” (Cowardin et. al. 1979)

Federal Agencies

Federal agencies define wetlands for regulatory and planning purposes. The U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) define wetlands as follows: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

State of Maryland

The State of Maryland defines wetlands for regulatory purposes, recognizing three main types of wetlands: nontidal wetlands, private tidal wetlands, and state tidal wetlands. Each wetland type is defined by their spatial distribution, hydrology, vegetation, and soils.

Nontidal Wetlands. Nontidal wetlands are "(a) an area that is inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation; (b) is determined according to the Federal Manual; (c) does not include tidal wetlands regulated under Natural Resources Article, Title 9, Annotated Code of Maryland." The Code of Maryland Regulations (COMAR) defines the following specific types of wetlands: emergent, farmed, forested, isolated and scrub-shrub.

The State has identified *nontidal wetlands of special State concern* which are “areas designated (COMAR 26.23.06.01) as having exceptional ecological or educational value of Statewide significance.” These wetlands are designated using the following criteria (COMAR 26.23.06.04):

- a) Provide habitat or ecologically important buffers for the habitat of plant and animal species:
 - (i) Listed as endangered or threatened by the U.S. Fish and Wildlife Service
 - (ii) Listed as endangered or threatened, or species listed as in need of conservation by the Department of Natural Resources
 - (iii) Considered to be a candidate for listing by the U.S. Fish and Wildlife service, or considered to be locally unusual or rare by the Department of Natural Resources
- b) Are unique natural areas or contain ecologically unusual natural communities

The State also recognizes nontidal wetlands containing "Significant plant or wildlife value:

- (a) of the following unusual or unique community types: (i) Bogs, (ii) Areas with bald cypress, Atlantic white cedar, red spruce, balsam fir, or American larch that contain at least 20 percent of these species in any strata as determined by the Federal Manual, or (iii) Delmarva Bays
- (b) with water discharge that maintains minimum stream base flow important for maintaining plant and wildlife species
- (c) with threatened or endangered species, or species in need of conservation
- (d) adjacent to Class III or Class IV waters defined in COMAR 26.08.02.08
- (e) of Special State Concern
- (f) supporting vernal pools
- (g) that is regularly or periodically influenced by tidal waters"

Tidal Wetlands Tidal wetlands are defined as "all State and private tidal wetlands, marshes, submerged aquatic vegetation, lands, and open water affected by the daily and periodic rise and fall of the tide within the Chesapeake Bay and its tributaries, the coastal bays adjacent to Maryland's coastal barrier islands, and the Atlantic Ocean to a distance of 3 miles offshore of the low water mark" (COMAR 26.24.01.02).

Vegetated tidal wetlands are also mapped by the State. State maps have been used since 1972 to identify the regulatory boundaries of wetlands under the jurisdiction of the Maryland Tidal Wetlands Act. According to the state maps, there are approximately 200,000 acres of vegetated tidal wetlands. Tidal wetlands include both fresh and brackish systems, with emergent, shrub, and forested vegetation. More recent aerial photographs, from the 1980's and 1990's, are used for guidance purposes.

State Tidal Wetlands State tidal wetlands are “any land under the navigable waters of the State below the mean high tide, affected by the regular rise and fall of the tide. Tidal wetlands of this category which have been transferred by the State by a valid lease, patent, or grant confirmed in Article 5 of the Maryland Declaration of Rights are considered private tidal wetlands to the extent of the interest transferred.”

Private Tidal Wetlands Private tidal wetlands are "a) land not considered State wetland bordering on or lying beneath tidal waters, which is subject to regular or periodic tidal action and supports

aquatic growth; b) tidal wetlands transferred by the State by a valid lease, patent, or grant confirmed in Article 5 of the Maryland Declaration of Rights, to the extent of the interest transferred; and c) tidal waters created by the excavation of upland unless conveyed to the State.”

Wetland Distribution

Wetlands may be permanently flooded by shallow water, permanently saturated by groundwater, or periodically inundated or saturated for varying periods during the growing season in most years. Many wetlands are the periodically flooded lands that occur between uplands and salt or fresh water bodies (ie., lakes, rivers, streams and estuaries). Other wetlands may be isolated in areas with seasonally high water tables that are surrounded by upland or occur on slopes where they are associated with groundwater seepage areas or drainageways. Wetlands are important natural resources providing numerous values to society, including fish and wildlife habitat, flood protection, erosion control and water quality preservation. Wetlands comprise a range of environments within interior and coastal regions of Maryland (Figure A-2).

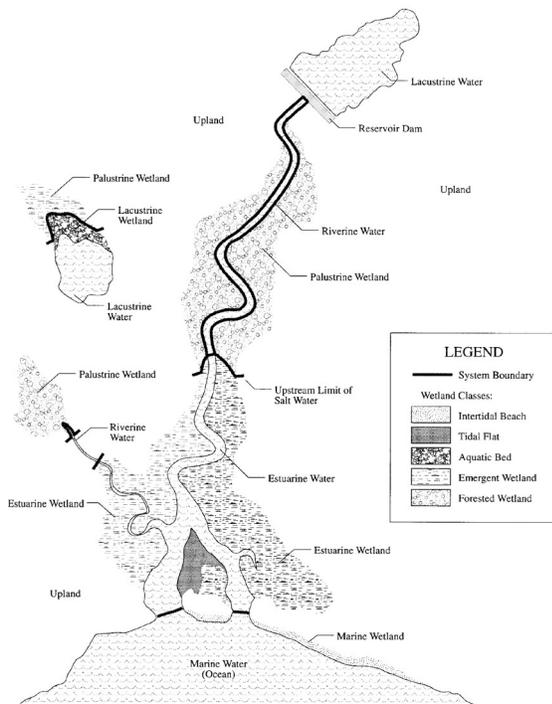


Figure A-2. Illustration of the predominant wetland classes that may be present in a continuum of lacustrine, riverine, palustrine, estuarine and marine environments of Maryland (Tiner and Burke, 1995).

The following wetland descriptions are summarized from *Wetlands of Maryland* (Tiner and Burke, 1995). In these descriptions, wetland distribution, occurrence and type are characterized according to the five physiographic Provinces of Maryland.

Coastal Plain Province

This region likely has the highest diversity of emergent estuarine and palustrine (freshwater) wetland communities in the state, since both tidal and nontidal freshwater marshes occur here. Wetlands are abundant in the Coastal Plain due to the low topographic relief and high groundwater table characteristic of the region.

Estuarine Wetlands

Estuarine wetlands are common throughout the Coastal Plain. These systems consist of salt and brackish tidal waters and contiguous wetlands where ocean water is at least occasionally diluted by freshwater runoff from the land. These wetlands extend extensively upstream in tidal rivers to freshwater areas. Differences in salinity and tidal flooding within estuaries have a significant effect on the distribution of these wetland systems. Salt marshes occur on the intertidal shores of tidal waters in areas of high salinity. Brackish marshes are the predominant estuarine wetland type in Maryland. They are found along the shores of Chesapeake Bay, mostly on the Eastern Shore, and for considerable distance upstream in coastal rivers. Estuarine shrub swamps are common along the Maryland coastal zone. Aquatic beds, comprised mostly of submerged aquatic vegetation, are abundant in shallow water zones of Maryland's estuaries, especially the Chesapeake Bay and its tributaries.

Palustrine Wetlands

Forested wetlands are the most abundant and widely distributed palustrine wetland type on the Coastal Plain. These wetlands are found on floodplains along the freshwater tidal and nontidal portions of rivers and streams, in upland depressions, and in broad flat areas between drainages. Tidal freshwater swamps occur along coastal rivers in areas subject to tidal influence. Semipermanently flooded swamp forests, uncommon to Maryland, are found along Battle Creek on the Western Shore and the Pocomoke River on the lower Eastern Shore. Seasonally flooded swamp forests occur in these same areas as well as part of Calvert, Somerset, Wicomico, and Worcester Counties. Temporarily flooded swamp forests occur on isolated floodplains, in isolated depressions surrounded by uplands, or in interstream divides, and are particularly abundant on the Eastern Shore. Scrub-shrub swamps are not abundant on the Eastern Shore. Bog wetlands are rare in Maryland; sixteen have been identified in Anne Arundel, Charles, and Prince Georges Counties on the Western Shore. Emergent wetlands on the coastal plain comprise both tidal and nontidal freshwater marshes and are highly diverse wetland communities. Tidal fresh marshes are common along large coastal rivers, such as the Nanitoke, Chester, Choptank, Pocomoke, Patuxent, and Potomac Rivers. Interdunal wet swales are found on Assateague Island. Seasonally flooded marshes are common to the coastal plain. On the Eastern Shore, isolated wetlands, commonly referred to as potholes or Delmarva Bays, are most common in Caroline, Kent, and Queen Anne's Counties.

Piedmont Province

Overall, wetlands are less abundant and diverse in the Piedmont Province compared to the Coastal Plain, due to greater topographic relief, regional geology, a lower groundwater table and lack of tidal influence. Isolated palustrine and riverine wetlands are common in the region. Forested wetlands within the Piedmont are typically found on floodplains in stream valleys and are characterized by the relatively short frequency and duration of flooding (seasonally flooded and temporarily flooded forested wetlands). Scrub shrub wetlands are found in wide river floodplains, valleys and meadows. Emergent wetlands can occur in areas of former forested wetlands that were cleared for agricultural, meadows and valleys and are characterized by the greater frequency and duration of flooding (seasonally flooded marshes and meadows, and temporarily flooded wet meadows). The greater duration and frequency of flooding typically favors emergent plant species over scrub shrub and forested plant communities.

Western Maryland Provinces

The Appalachian Plateau, Valley and Ridge, and Blue Ridge Provinces comprise the region of western Maryland. Wetlands are uncommon in this region when compared with other regions of Maryland. Wetlands are often found in topographic depressions and associated with riverine and palustrine environments. Although less common, the wetlands of western Maryland are rather diverse, including forested, scrub-shrub (wet thickets and shrub bogs), emergent (seasonally flooded wet meadows and marshes), palustrine (aquatic bed), riverine, and lacustrine (aquatic bed) wetlands.

Coastal Wetlands

As shown in Table A-3, 66.4 percent of the coastal (tidal) wetlands in Maryland are located in the Pocomoke and Nanticoke River Basins (both part of the Lower Eastern Shore watershed) and the Choptank River Basin on the Eastern Shore.

Table A-3. Total acreage and percent acreage of coastal wetlands in the major watersheds of Maryland (McCormick and Somes, 1982).

Sub-Basin Designation	Watershed	Acres	Percentage of Total Acreage
02-12-02	Lower Susquehanna River	841	0.3
02-13-01	Coastal Area	17,225	6.6
02-13-02	Pocomoke River	53,246	20.4
02-13-03	Nanticoke River	83,409	31.9
02-13-04	Choptank River	36,877	14.1
02-13-05	Chester River	16,204	6.2
02-13-06	Elk River	3,848	1.5
02-13-07	Bush River	5,992	2.3
02-13-08	Gunpowder River	2,599	1.0
02-13-09	Patapsco River	819	0.3
02-13-10	West Chesapeake River	3,419	1.3
02-13-11	Patuxent River	6,773	2.6
02-13-99	Chesapeake Bay	21,321	8.2
02-14-01	Lower Potomac River	8,438	3.2
02-14-02	Washington Metropolitan Area	298	0.1
	Total	261,309	100.0

Tidal wetlands are abundant on the lower Eastern Shore of the Coastal Plain and cover extensive areas (Figure A-5). Tidal wetlands are distinguished by their flood regime: wetlands flooded at least once per day are considered “low marsh” and those flooded less than once per day are considered “high marsh.” High marshes are typically flooded by high spring or storm tides. During the current post-glacial period, the gradual rise of sea level has resulted in the conversion of vegetated tidal wetlands to open water areas, and the conversion of forested nontidal wetlands

to tidal marsh. Sea level rise has also inundated 16,721 acres of estuarine-forested wetlands, equivalent to 6.7 percent of Maryland's total estuarine wetlands acreage.

Eighty-two percent, 205,815 acres, of Maryland's estuarine wetlands are emergent, thus making it the most common estuarine wetland type. Non-vegetated estuarine wetlands include 10.5 percent of the total acreage of estuarine wetlands. These coastal wetlands are extremely important to the Chesapeake Bay ecosystem and Maryland's economy (Figure A-6).

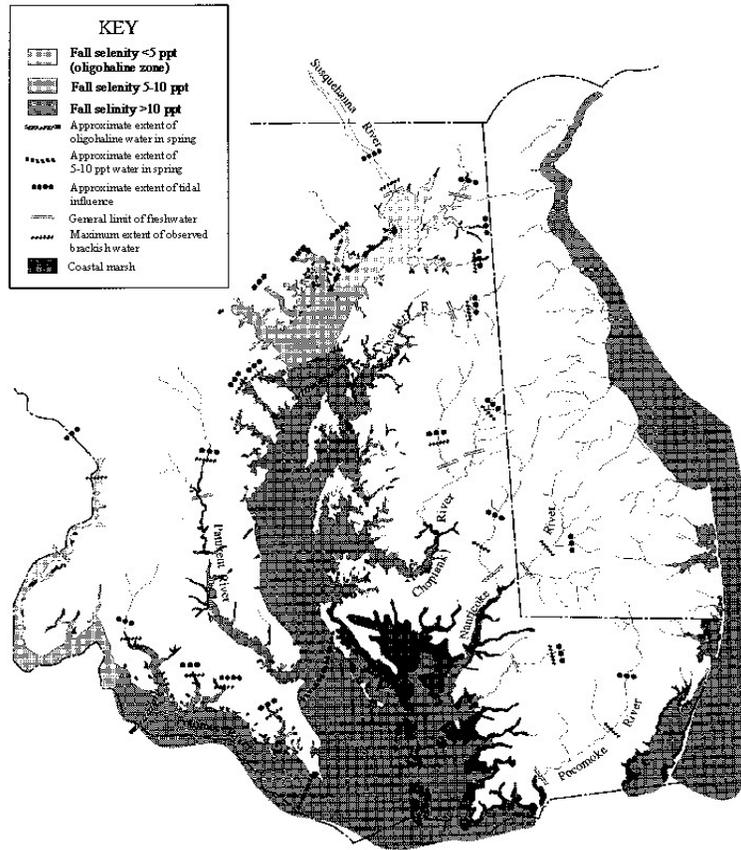


Figure A-5. Distribution of Maryland's estuarine and tidal fresh marshes in Chesapeake Bay and its major tributaries (Tiner and Burke, 1995).

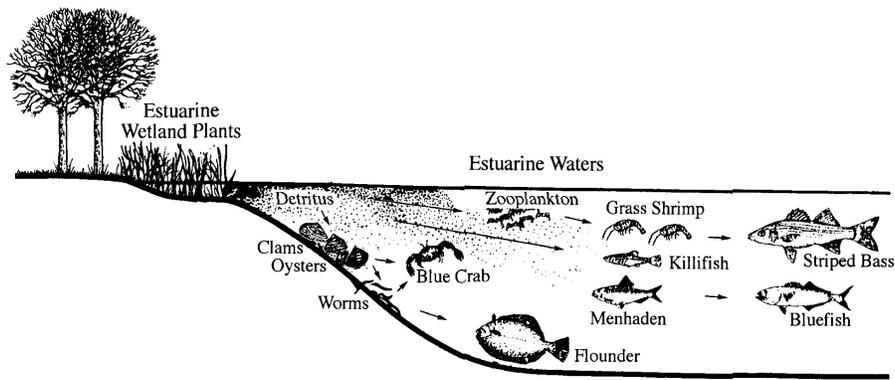


Figure A-6. Tidal marshes are the estuarine farmlands that produce tons of food each year that support Chesapeake Bay’s living aquatic resources and ultimately, provide food for human consumption. Simplified food pathways from tidal marsh plants to commercial and sport fishes of value to humans are simplified for illustration (Tiner and Burke, 1995).

The following is a summary the predominant type(s) of wetland in each watershed. The Upper Eastern Shore (including the Chester and Elk River basins) contains mostly freshwater marshes but also some brackish high marshes. The Lower Eastern Shore (including the Nanticoke and Pokomoke River basins) contains a high amount of brackish high and low marshes, and submerged aquatic wetlands. The Choptank watershed contains mostly brackish high marshes and submerged aquatic wetlands. The Upper Western Shore (including the Bush, Gunpowder and Lower Susquehanna River Basins) and Patapsco watersheds predominately contain freshwater marshes. The Lower Western Shore, or West Chesapeake, watershed contains brackish high marshes and submerged aquatic wetlands. The Patuxent watershed contains almost equal proportions of freshwater marsh and brackish high marshes. The Lower Potomac contains mostly brackish high marshes. The Middle Potomac or Washington-Metro watershed contains mostly brackish high marshes, but also contains the highest percent of coastal wooded swamps in the state (26.8%). There are no coastal wetlands in the Upper Potomac watershed.

Nontidal Wetlands

Generally, the Eastern Shore nontidal wetlands are characteristically low and flat. These nontidal wetlands are often difficult to identify and delineate due to the minor variations in regional topography and the similarity of wetland vegetation to vegetation found in surrounding uplands. On the Lower Eastern Shore, the wetlands may cover broad areas. Predominantly clay rich soils, which have slow drainage and form confining layers, help to retain ground water in these wetlands. Landscapes on the Upper Eastern Shore have steeper grades, and wetlands tend to be less extensive and have more rapid drainage. Caroline, Kent, and Queen Anne’s Counties have the most abundant numbers of a unique wetland type commonly called a Delmarva Bay. These wetlands are usually isolated from surface water drainage systems and are elliptical in shape with sandy rims. Rare plant species are often found in these wetlands on the Eastern Shore. Other wetland rare plant communities on the Eastern Shore include those with Bald cypress and Atlantic white cedar.

On the Western Shore of the Coastal Plain, wetlands have more varied topography and are generally easier to delineate in comparison to wetlands on the Eastern Shore. These wetlands are often located near streams, although the prevalence of long-term overbank flooding is rare in these areas. Most Western Shore wetlands are supported by localized, perched water tables than by shallow groundwater.

Nontidal Wetlands of Special State Concern.

Nontidal wetlands of Special State Concern are some of the most ecologically important of Maryland's nontidal wetland habitats and are designated for special protection under the State's nontidal wetland regulations. These 398 wetland sites have exceptional ecological and educational value and offer landowners opportunities to observe and safeguard the beauty and natural diversity of Maryland's remaining wetlands. Many of these special wetlands contain populations of rare and endangered native plants and animals. Other nontidal wetlands of Special State concern represent examples of unique wetland types and collective habitats for species that thrive in specialized environments. Examples of these special types of wetlands are bogs, Delmarva bays and coniferous swamp forests. Bogs are highly acidic wetlands that lack the nutrients most common plants require and, therefore, provide habitat for specific communities of plants and animals. The Delmarva Bays are depressions on the Eastern Shore that fill with water in the winter and spring, and dry in the late summer and fall. Because these environments are isolated and their supporting characteristics in the landscape are limited, they support many rare and unique species. Coniferous swamp forests are uncommon to Maryland and found in areas such as Garrett County.

Wetlands Conservation

Although Maryland has lost 45-65 percent of its original wetlands, many of which were drained for agricultural purposes, wetlands remain quite abundant. Increased federal and State efforts in wetland restoration may eventually help achieve a net gain in wetlands, provided wetland regulatory programs maintain effective control of existing wetland resources (Tiner and Burke, 1995). Government regulatory programs have improved wetland conservation by providing for better protection of wetlands than at anytime before. As populations expand, there will be increased demand for development of commercial, resort, and residential real estate that will undoubtedly place additional pressure on remaining wetlands. To date, the public has supported wetland protection efforts by recognizing the important water quality, flood storage, wildlife habitat, and other functions that wetlands perform. (Tiner and Burke, 1995).

In addition, wetlands can be negatively impacted by water quality problems throughout the State. While many wetlands provide water quality improvement functions, and are valued for this service, the wetlands do have limits to their capacity for filtering pollutants. Although control of point sources of water pollution such as industrial effluents and municipal wastewater treatment plants, is improving the quality of many of Maryland's waterways, urban and agricultural runoff continue to degrade water quality. Improved techniques for storm water discharge treatment, riparian habitat management and employment of best management practices on farmland and managed forests, may further enhance water and wetland quality (Tiner and Burke, 1995).

Table A-4a. Summary of current vegetated wetland acreage by county.

County	<u>Present Acreage</u>
Allegany	442
Anne Arundel	21,119
Baltimore City	153
Baltimore County	6,774
Calvert	12,061
Caroline	37,564
Carroll	9,395
Cecil	8,561
Charles	35,147
Dorchester	185,281
Frederick	1,366
Garrett	7,924
Harford	14,088
Howard	4318
Kent	19,295
Montgomery	13,668
Prince George's	22,609
Queen Anne's	40,631
St. Mary's	26,005
Somerset	99,534
Talbot	19,494
Washington	2,266
Wicomico	71,266
Worcester	88,764
TOTAL	757,724

Present wetland acreage was estimated by digital interpretation of NWI (National Wetland Inventory), enhanced NWI, and MD-DOQQ wetland maps.

Wetland acreage figures do not include submerged aquatic vegetation.

Sea Level Rise

Losses of coastal wetlands due to sea level rise have generated considerable discussion. However, natural processes do result in conversion of tidal marshes to open water areas, as well as causing the development of new marshes. The shorelines of Chesapeake and Coastal Bays have been in a cycle of formation, “drowning” and erosion for thousands of years. Depending on the rate of sea level rise, the total acreage of coastal wetlands could either naturally increase or decrease. Losses by natural processes are more of a concern when manmade actions have interrupted or prevent natural processes that form new wetlands.

Various federal, State, and local agencies, voluntary programs and the academic community are actively investigating the effects of sea level rise in Maryland. Current statewide initiatives will help guide the State’s efforts to protect and conserve coastal resources and lands; these include the Chesapeake 2000 Agreement, development of the Maryland Wetland Conservation Plan (MDE), the Sea Level Rise Response Strategy (DNR, Coastal Zone Management Division), and the Coastal Bays Management Plan. The Coastal and Watershed Resources Advisory Committee (CWRAC) held a forum (May 1999) addressing the impacts of climate change and sea level rise in the Chesapeake Bay. The forum produced a report outlining management strategies and recommendations for the Chesapeake 2000 Agreement.

A Sea Level Rise Workshop (January 2001) was hosted by MDE to begin examining the issue for Maryland’s State Wetland Conservation Plan and related commitments in the Chesapeake Bay 2000 Agreement. Workshop participants included researchers and technical experts, representatives from State resource and regulatory agencies, and local government agencies. The workshop addressed a wide range of issues relating to the effects of sea level rise on wetlands in Maryland. A prominent concern throughout the Workshop was the need for further definition of the causes and effects of sea level rise in Maryland. Participants identified the following research topics to better define the current and future impacts of sea level rise on coastal wetlands;

- 1) Rate of Sea Level Rise: In certain areas of Maryland the average rate of sea level rise is significantly greater than the global average; factors contributing to localized increases in the rate of sea level rise include land subsidence due to groundwater withdrawals and regional post-glacial adjustments of the crust. [Note: The Mid-Atlantic region was located just beyond the southernmost extent of the continental ice sheet (also called the forebulge area). During glaciation, this region was uplifted upward due to compression and displacement caused by downwarping of the crust to the north. Subsequently, the Mid-Atlantic region continues to subside while the Northeast region rebounds.
- 2) Resource Risk Assessment: Because the rate of sea level is variable throughout the coastal region, certain counties will be at higher risk for impacts. Therefore, the spatial distribution of potential lands and resources at risk should be identified as well as the estimated rates of inundation, coastal erosion, and loss of resources.
- 3) Loss of Wetland Function: The threat of rising seas imposes numerous threats to coastal wetlands, especially loss of functions that are valuable to local communities. Wetlands

provide water quality, flood protection, habitat, and recreational and commercial resources, all of which may be at risk in many coastal areas.

- 4) Integration With Other Rationales: The potential widespread impacts due to sea level rise could seriously compromise the economic and social structure of coastal communities. Many local agencies will face these considerations in future planning and management strategies, including erosion control, flood prevention and mitigation, land use opportunities, location of infrastructure, public safety, navigation, and land and resource management practices.
- 5) Ecological Impacts: Incremental changes in sea level rise over time pose serious threats to coastal wetland ecosystems and the Chesapeake Bay. The ability of these ecosystems to adapt to change will depend upon future resource regulation and management.

Coastal Erosion

A comprehensive, and most current, review of coastal erosion was produced by the Shore Erosion Task Force. The Shore Erosion Task Force was created under Resolution 13, passed during the 1999 Legislative Session. Its mission was to identify county needs, clarify stakeholder roles, develop long range plans and review plan effectiveness, regarding shore erosion in Maryland. The primary findings of the task force include the need to address the following issues: (1) develop a comprehensive and regional approach to shore erosion control; (2) improve coordination of shore protection activities among various entities; (3) establish project review and selection criteria; (4) encourage the use of dredge materials in regional projects; (5) review engineering standards and conduct technical evaluations; (6) develop a financial strategy to address funding needs; (7) conduct public education; and (8) determine and fulfill data needs. The report outlines specific recommendations for each of these issues and an implementation strategy.

Invasive and Exotic Species

The following commitment, from the Chesapeake 2000 Agreement, outlines a general strategy for management of non-native, invasive and problematic species within the Chesapeake Bay watershed.

“By 2001, identify and rank non-native, invasive aquatic and terrestrial species which are causing or have the potential to cause significant negative impacts to the Bay’s aquatic ecosystem. By 2003, develop and implement management plans for those species deemed problematic to the restoration and integrity of the Bay’s ecosystem.”

In 1994, the Chesapeake Bay Program (CBP) recognized the potential adverse affects of exotic species on Bay wetlands and adopted objectives to address the problem of exotic species management:

- 1) Assess, utilize, and influence current non-native invasive species mangement programs throughout the Bay watershed and the nation.

Actions – inventory current programs that address non-native invasive species in the Bay ecosystem; discuss establishment of an advisory panel; and provide recommendations on the 2001 re-authorization of the Non-indigenous Aquatic Nuisance Program and Control Act (NANPCA).

- 2) Identify and rank non-native, invasive aquatic and terrestrial species which are causing or have the potential to cause significant negative impacts to the Bay's aquatic ecosystem.

Actions – develop criteria for identifying priority issues, identify potential priority species, and identify and rank non-native species of concern; assessment of the social, legal, and jurisdictional implications of managing select species; and assessment of the ecological consequences of select species through scientific review.

- 3) Develop and implement management plans for those species deemed problematic to the restoration and integrity of the Bay's ecosystem.

Actions – develop management plans for selected problematic species, development and implementation of a ballast water management plan.

Phragmites

Phragmites, or common reed (*Phragmites australis*), is a large perennial grass often found in wetlands and disturbed areas. *Phragmites* is widely viewed as a destructive component of wetlands, contributing to widespread loss and degradation of both nontidal and tidal wetlands in Maryland. The negative aspects of *Phragmites* include: formation large dense stands that provide little wildlife value, reduction in the diversity of plant and wildlife species, and rapid spreading by creeping rhizomes.

Phragmites control programs use combination approaches including chemical treatment (herbicides) and physical removal (mowing, flooding, draining, and burning). The U.S. Fish and Wildlife Service conducted an aerial survey of *Phragmites* distribution along the shorelines of Chesapeake Bay from 1995 to 1997.

Distribution and Abundance of *Phragmites* in Maryland's Coastal Chesapeake Bay 1996

Largest Circle = 350 acres
4,138 sightings
Over 8,500 acres

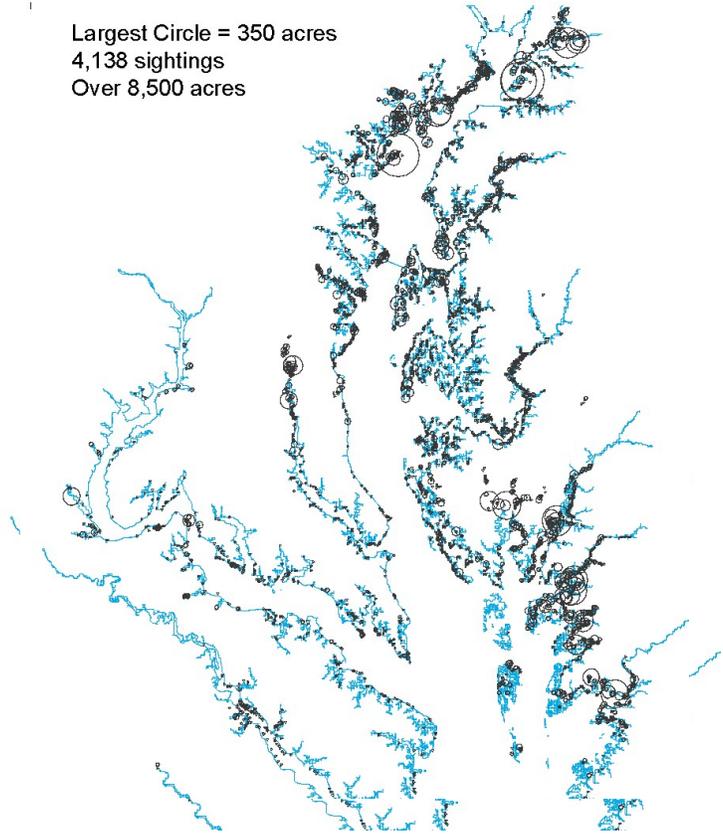


Figure A-9.

Map courtesy Doug Forsell, USFWS

Control of *Phragmites* is advocated by various federal and State government agencies and private industries, such as the U.S. Fish and Wildlife Service, Chesapeake Wildlife Heritage,

Wildfowl Trust of North America, Inc., and the Maryland Departments of Natural Resources, Agriculture, and Environment.

Despite its negative impacts to wetlands, *Phragmites* does have several beneficial qualities. Along shorelines that are eroding rapidly, *Phragmites* stabilizes marsh substrate and other shoreline sediments. Often these areas are highly disturbed and are unable to support native wetland plant communities. Eradication methods (such as mowing, flooding, draining, and burning) could have significant negative impacts on these already unstable coastal marsh systems.

Nutria

The South American nutria (*Myocastor coypus*) was introduced to parts of the Eastern Shore during the 1940's by Maryland's fur industry. The introduction of these large herbivorous rodents has coincided with the loss of extensive tracts of emergent marsh in Dorchester County, particularly along the Blackwater River Basin. It is assumed that decline of the fur industry has caused overpopulation of the species. In response to overabundance of nutria and significant loss of marsh in this region, the State legislature proposed a 10-year nutria eradication program. However, the effect of nutria activity on marsh loss is unclear and the eradication program has been postponed, pending more conclusive information. In 1995, the Maryland Department of Natural Resources and Patuxent Wildlife Research Center developed a study plan developed to isolate the effects of nutria activity on marsh loss and determine whether exclusion of nutria from emergent marsh habitats will stabilize or recover marsh vegetation. Preliminary findings indicate that cumulative sediment deposition is reduced on non-vegetated marsh surfaces, and without vegetation to stabilize the marsh, the sediments will continue to erode. In areas where nutria were

excluded, only partial marsh revegetation occurred. The study suggests that marsh accretion and restoration would be needed to elevate the marsh surface to establish vegetative growth (Haramis, 2000).

The Maryland Marsh Restoration and Nutria Control Program is a team of state, federal, and non-governmental biologists and natural resource managers who have been researching nutria for last 10 years. The Program goal is to better understand basic nutria reproductive biology, determine the most effective control techniques, understand the cause and effect relationship between nutria activity and marsh loss, and to educate the public about the impacts of nutria on other wildlife communities and wetlands (National Wetlands Newsletter, July-August 2000). The Program aims to control nutria populations while working toward eliminating this non-native species from Maryland.

Human Impacts

Human influences have caused significant changes in the function and quality of many wetlands. These changes have resulted from alteration of the physical, chemical and biological components of wetland ecosystems. Filling, grading and excavation for development in a wetland typically destroys it.

Alterations to wetland hydrology, such as by ditching, may result in a lowering of wetlands and shorter durations of inundation that wetland dependent plants die and are replaced by more transitional or upland longer. Extensive ditching in an area may lower water levels so much that the area is no longer considered to be a wetland. Other effects of ditching may cause a reduction in base flow provided by the wetland to an adjacent stream. Other human activities that can have lasting effects on wetland ecosystems include; stream channelization, dam construction, discharge of industrial wastes and municipal sewage (point source pollution) and runoff urban and agricultural areas (non-point source pollution). These activities contribute to changes in the flood regime of wetlands and the input and cycling of nutrients.

Indirect or Secondary Impacts

A wide range of off-site activities can affect the condition and function of wetlands. Certain activities conducted in ground water and surface water discharge areas, streams, and other water bodies, can alter the hydrologic regime of wetlands. Increases in impervious surface that result in less groundwater recharge may reduce the amount of groundwater that provides much of a wetland's hydrology. This change, in turn, can influence wetland vegetation communities, which can include sensitive and rare species, and can facilitate colonization of invasive or nonnative species.

Indirect or secondary impacts result from disturbances that occur in areas outside of the wetland, such as uplands, adjacent wetlands, floodplains, and waterways. Common indirect impacts include influx of surface water and sediments, fragmentation of a wetland from a contiguous wetland complex, loss of recharge area, or changes in local drainage patterns. Widespread land development and clearing have also caused increased erosion in uplands areas leading to increased sedimentation in lowland wetlands. This increased accumulation of sediment can alter the chemical and hydrologic regime of the wetlands in a relatively short time. However,

sediment transport is part of a natural process and erosions and re-deposition is essential for maintaining streams and tidal wetlands.

Many indirect impacts are regulated by State and federal laws and programs, including impacts associated with stormwater management, ground water and surface water discharges, , and sediment deposition and erosion.

Appendix B

Wetland Management and Conservation

Maryland authority governing nontidal wetlands and waterways closely parallels the federal controls, but evolved from three separate acts of the Maryland General Assembly. In 1933, the assembly recognized that man-made changes to a stream or other body of water may result in flooding, adverse impacts to fish habitat and migration, and increased erosion. The Waterway Construction Statute was passed to regulate activities in streams and their 100-year floodplains. In 1970, tidal wetlands were given state protection. Then a commitment to increase the protection of nontidal wetlands contained in the 1987 Chesapeake Bay Agreement resulted in 1989 legislation, which established a State nontidal wetlands program that began full implementation in 1991.

Tidal Wetlands Act

In 1970, the Maryland General Assembly recognized that many wetlands had been lost or despoiled throughout the State by unregulated activities such as dredging, dumping and filling, and that remaining wetlands were in jeopardy. The assembly established the Tidal Wetlands Act, which restricts construction and development actions in tidal wetlands.

Prior to enactment of the Tidal Wetlands Act, over 1,000 acres of wetlands were being destroyed throughout tidewater Maryland every year. The Act states that unregulated activities will "affect adversely, if not eliminate entirely, the value of the wetlands as a source of nutrients to finfish, crustaceans, and shellfish of significant economic value" and will "destroy the wetlands as a habitat for plants and animals of significant economic value and eliminate or substantially reduce marine commerce, recreation, and aesthetic enjoyment." The Act also declares: "It is the policy of the State, taking into account varying ecological, economic, developmental, recreational, and aesthetic values, to preserve the wetlands and prevent their despoliation and destruction."

The Tidal Wetlands Act mandated the mapping of tidal wetlands and the creation of a regulatory program to protect the State's tidal wetland resources. A map of the upland boundary of tidal wetlands was needed to establish regulatory jurisdiction for State and privately owned tidal wetlands. Maryland developed 2,400 scale tidal wetland boundary maps (1" = 200'), which delineate tidal wetlands boundaries and depict vegetation types. In addition, the resource was defined as either state or private tidal wetlands. State wetlands include all the open water and vegetated wetlands below mean high water, and are owned by the State of Maryland. Private wetlands include all tidal wetlands above the mean high water line, which are in private ownership. The Tidal Wetland Maps of Maryland were completed in 1972 using low-altitude photographs of tidally influenced areas of the coastal and interior bays of Maryland.

It should be noted that the majority of wetlands evaluated under the Maryland Program are State owned wetlands which include low marsh and open water wetlands (refer to Section III, Regulatory Framework for discussion of State and private wetlands).

Living Shorelines Protection Act

In 2008, the Maryland General Assembly enacted the Living Shorelines Protection Act. The Act established “living shorelines” as the preferred method of preventing excess erosion of shorelines. Key provisions of the regulations to implement the Living shorelines Protection Act include: 1) Improvements to protect a person’s property against shoreline erosion must consist of marsh creation or other nonstructural shoreline stabilization measures, i.e. Living Shorelines, that preserve the natural environment unless a Waiver is obtained. Criteria to qualify for a waiver are detailed below:

A property owner meeting one of the following criteria may obtain a waiver to the requirement to build a nonstructural shore erosion control measure:

- 1) The project shoreline is mapped as an area appropriate for structural shoreline stabilization measures and displayed on the Maryland Department of the Environment’s website. Current criteria in mapped areas are based on erosion rates being at least 8 feet/year.
- 2) The project site is not suitable for a Living Shoreline due to excessive erosion, severe high energy conditions, extreme water depths, or the fact that the waterway is too narrow for effective use of nonstructural shoreline stabilization measures.

A person wishing to build a structural shoreline stabilization project must submit an approved Waiver with any application for a Tidal Wetlands License. The current waiver process consists of an individual site visit and review by the MDE project manager using parameters on a checklist provided by the applicant/contractor/agent that is used to determine if a waiver from proposing a Living Shoreline may be issued. MDE is working with the Virginia Institute of Marine Science, with additional consultation with DNR and the Critical Areas Commission, to develop a web based tool which applies additional criteria in evaluating waiver requests. The new tool will identify recommendations for shoreline practices in the study areas based on the same criteria on the current waiver form, eliminating the need for the MDE project manager to analyze the waiver checklist and make a waiver determination.

An applicant for a Tidal Wetlands License to construct a shore erosion control measure must submit the following information:

- a) Joint Federal/State Application for the Alteration of any Tidal Wetland in Maryland
- b) A proposed Critical Area Buffer Management Plan
 - a) A signed Critical Area Buffer Notification Form

Review under the Living Shorelines Act and Tidal Wetlands Act includes balancing considerations of SAV protection, shallow water habitat, erosion control, and vegetated tidal wetland gains.

Tidal Wetlands Program

Tidal wetlands are managed to provide reasonable use while furnishing essential resource protection. Licenses, issued by the State's Board of Public Works based on recommendations from MDE's Water and Science Administration (WSA), are required for projects in State wetlands. The Board of Public Works is comprised of the Governor, the Comptroller of the Treasury, and the State Treasurer. Permits are issued directly by WSA for projects in private wetlands. A permit or license must be obtained before a person fills, dredges, or otherwise alters a tidal wetland. Typical projects include: shoreline protection projects including marsh creation, stone revetments, and bulkheads; piers; dredging; and stormwater discharges.

Construction of the following projects in tidal wetland areas require authorization from WS A: filling, dredging, bulkheads, revetments, boat ramps, jetties, cable crossings, storm drain systems, groins, breakwaters, vegetative stabilization, and similar structures. Applications are evaluated to insure that appropriate steps are taken to first avoid, then minimize impacts to tidal wetlands. Mitigation is required for unavoidable impacts, with the amount of mitigation based on resources impacted, type of mitigation proposed, and location of the mitigation. In-kind and onsite mitigation is preferred and required wherever appropriate site conditions exist.

Most agricultural activities are exempt from requirements of the Act. Grazing is allowed without notification or approval provided that tidal wetland vegetation is not destroyed. Unlike the Nontidal Wetlands Act, aquaculture is not considered an agricultural activity. Aquaculture does not occur in vegetated tidal wetlands. Dredging of seafood products is exempt from this Act if the work is done by an operator licensed by the Department of Natural Resources (DNR). Harvesting of submerged aquatic vegetation is also exempt if no dredging is involved. The cutting of submerged aquatic vegetation requires a permit from DNR. Installation and operation of tide gaits, used by some farmers to prevent salt water from entering agricultural fields, is reviewed under standard permit requirements. Construction of mosquito ditches is not considered an agricultural activity, though it is reviewed by the Department of Agriculture (MDA). They are also exempt if approved by MDA. Projects such as farm roads are reviewed under standard review criteria.

In recent years, the regulatory program has limited the loss of vegetated tidal wetlands to less than one acre per year. More importantly, Maryland is realizing a net gain in tidal wetlands through mitigation and enhancement projects.

Nontidal Wetlands Protection Act

The 1987 Chesapeake Bay Agreement included a commitment to increase the protection of nontidal wetlands. To honor its commitment, Maryland created a special task force to develop a comprehensive wetland protection policy. Due to continued wetland losses and an existing inefficient regulatory framework, the task force recommended a new State law. In 1989, the Maryland General Assembly endorsed the task force recommendation by enacting the Nontidal Wetlands Protection Act.

The Nontidal Wetlands Protection Act seeks to protect these lands by regulating and restricting all activities that could impact nontidal wetlands or waters of the state. The Act also helps to insure “no net loss” in wetlands acreage and function, by requiring mitigation or compensation for any wetland losses. The Act also has provisions for the structuring of a smooth and expedient application review process, for dealing with developments in wetlands. The Act also directs the Department assist local governments in undertaking nontidal wetland management planning, and provide technical assistance; conduct educational programs; purchase, restore and create nontidal wetlands and adopt standards for planning, regulating, restoring, and creating, and enhancing nontidal wetlands.

The Nontidal Wetlands Protection Act also allows for delegation of all or part of the State program to local governments and provides for the development of watershed management plans. There are no currently delegated programs, though Prince George’s County briefly had a delegated program in the early 1990’s. Watershed management plans, developed in accordance with the Nontidal Wetlands Protection Act and the Code of Maryland Regulations (COMAR), can be used as the basis for regulatory decisions. The plans are developed in cooperation with local governments and specifically protect wetlands by incorporating them into a jurisdiction's land use decisions.

Nontidal Wetlands Regulatory Program

From its inception, Maryland's nontidal wetlands protection program was designed to parallel many aspects of Section 404 of the Clean Water Act (CWA). Regulated activities include:

- Removal, excavation, or dredging of soil or materials of any kind;
- Changing existing drainage or flood retention characteristics;
- Disturbance of the water level or water table by drainage, impoundment, or other means;
- Filling, dumping, discharging of material, driving piles, or placing obstructions; ● Grading or removal of material that would alter existing topography; and ● Destruction or removal of plant life.

Three aspects of Maryland law differ from federal regulation: authority over isolated wetlands, the alteration of vegetation and hydrology, and regulation of a 25-foot buffer. The regulation of these additional activities, plus clear jurisdiction over isolated wetlands, was intended to close loopholes that existed in the Section 404 program.

MDE also regulates the alteration of vegetation and hydrology in wetlands. This authority also differs from the Corps, in that the Corps may only regulate the placement of “fill” in wetlands.

MDE additionally regulates activities in a 25-foot buffer around nontidal wetlands, which the Corps does not. Buffer requirements are expanded to 100 feet for “nontidal wetlands of special State concern.” Nontidal wetlands of special State concern are designated by regulation and mapped as having exceptional ecological or educational value of statewide significance.

The regulatory differences in Maryland's wetlands laws recognize that the benefits provided by a wetland depend on its hydrology and vegetation, and that activities immediately adjacent to a wetland may have as much effect on its function as activities in the nontidal wetland itself.

There are two types of project approvals issued by the Nontidal Wetlands Program; a letter of authorization and a permit. Exempted activities, such as agricultural and forestry activities do not require MDE authorization. Certain other minimal impact activities are exempt, and may be issued an authorization to proceed to verify the exemption under specific circumstances. A letter of authorization may be issued for activities impacting less than 5,000 square feet of nontidal wetlands or less than one acre of isolated nontidal wetland. These activities do not require an alternative site analysis, public notice, or mitigation by the applicant. In these instances, MDE is responsible for mitigation. Examples include repair activities, utility projects, and construction of a private residence on a single lot. A permit is required for activities that do not qualify for an exemption or a letter of authorization. An alternative site analysis, public notice, and mitigation by the applicant are required. The State statute and regulations provide strict application review time frames.

Mitigation Program

Mitigation may be required for any permanent impacts to tidal wetlands and tidal waters. The permittee may satisfy their mitigation requirement through one of three different methods: the permittee may (1) conduct the mitigation; (2) withdraw credit from a tidal wetland mitigation bank; or (3) pay into the Tidal Fund. As there are no tidal wetland mitigation banks with available credit in Maryland, and because State regulations establish payment into the Tidal Fund as the least preferred option for mitigation, permittees perform the majority of tidal wetland mitigation projects, often on-site.

The Nontidal Wetlands Division of the WWP regulates proposed activities in nontidal wetlands and the 25-foot nontidal wetlands buffer or the expanded 100-foot buffer. The Division achieves "no net loss" in part through different types of mitigation efforts designed to replace lost wetland acreage and functions.¹ The permittee is required to mitigate for all unavoidable permanent wetland impacts for projects authorizing wetland impacts to more than 5,000 square feet, all nontidal wetland impacts to areas with significant plant or wildlife value,² and areas within the Chesapeake and Atlantic Coastal Bays Critical Area.³ Historically, a permittee could satisfy

¹ COMAR 26.23.04.03A provides: "It is the goal of the Act to attain no net overall loss in nontidal wetland acreage and function, and to strive for a net resource gain in nontidal wetlands. However, it may not be possible for the goal of no net loss to be achieved in each permit action. Achievement of this goal will occur through the regulatory components of this subtitle and other Statewide initiatives which incorporate nontidal wetlands creation, restoration, and enhancement projects outside of the regulatory framework."

² "Significant plant or wildlife value" means a nontidal wetland (a) with water with unusual or unique community types; (b) with water discharge that maintains minimum stream base flow important for maintaining plant and wildlife species; (c) with threatened or endangered species, or species in need of conservation; (d) adjacent to Class III or Class IV waters; (e) of special State concern; (f) supporting vernal pools; or (g) that is regularly or periodically influenced by tidal waters. COMAR 26.23.01.02B(80).

³ "Critical Area" means all lands and waters defined under Natural Resources Article, § 8-1807, Annotated Code of Maryland, and includes (a) all waters and lands under the Chesapeake Bay and its tributaries to the head of tide as indicated on the State wetland maps, and all State and private tidal wetlands; (b) all land and water areas within 1,000 feet beyond the landward boundaries of State or private tidal wetlands and the head of tides; and (c)

the mitigation requirement through various options: the permittee could: (1) perform the mitigation; (2) purchase credit from a mitigation bank or a consolidated mitigation site; or (3) pay into the Nontidal Wetland Compensation Fund (Nontidal Fund). Of the few nontidal wetland mitigation banks with available credit in the State, only one has been approved under the Mitigation Rule. The majority of the consolidated mitigation sites are now closed and use of any remaining credits does not meet Federal compensatory mitigation requirements. For projects authorizing wetland impacts to less than 5,000 square feet, the State mitigates for the wetland losses in place of the permittee. The State uses the Nontidal Fund to mitigate for these small losses as well as for permittees who have paid into the Nontidal Fund. As a result of this strategy, a net gain in nontidal wetland acreage has been achieved since the nontidal wetlands regulatory program took effect in 1991.

Mitigation requirements for nontidal wetlands are described in greater detail in *Maryland's Nontidal Wetland Mitigation Guidance* (Walbeck et. al 2011).

MDE is seeking approval to operate its in lieu fee (ILF) program in a manner consistent with federal requirements. The Department has a proven track record of identifying, planning, and executing environmental protection and restoration projects to meet ecosystem conservation, water quality improvement, and other objectives. The Department has been successfully managing an ILF wetland mitigation program, completing projects that have replaced lost wetland acreage, functions, and values, for more than 23 years. These projects have been funded through two independent special funds: (1) the Tidal Wetlands Compensation Fund (Tidal Fund), which has accepted mitigation payments since 1996; and (2) the Nontidal Wetlands Compensation Fund (Nontidal Fund), which has accepted mitigation payments since 1991. The Department is proposing to revise this existing ILF program to be consistent with the Mitigation Rule. In addition to wetland impacts requiring mitigation by the Corps, it is important to note that MDE's efforts also include mitigation for nontidal wetlands that may not always require compensatory mitigation by the Corps (e.g., isolated wetlands, some wetland type conversion loss, and for projects where mitigation requirements were waived by the Corps). The strength of the State's program establishes MDE as an equal partner with the Corps in implementing a successful mitigation program in Maryland under the Mitigation Rule.

The Department's proposed ILF Program, including the use, operation, and maintenance of the Tidal Fund, Nontidal Fund, and proposed Waterway Fund will be aligned with the Mitigation Rule, while also ensuring the continued success and viability of the ILF Program in replacing the loss of aquatic resource acreage, functions, and values resulting from unavoidable, authorized impacts to wetlands and waters of the United States. The scope of ILF Program seeking approval under the Federal Rule includes the ILF Program and ILF projects only and will not cover compensatory mitigation for authorizations issued prior to the execution of the ILF Instrument or authorizations excluded from Mitigation Rule authority⁴.

modifications to these areas through inclusions or exclusions proposed by local jurisdictions and approved by the Commission as specified in Natural Resources Article, § 8-1807, Annotated Code of Maryland. COMAR 27.01.01.01B(18).

⁴ MDE has been operating the Programmatic Fund well before the effective date of the Mitigation Rule and has been accepting money from other entities and for other purposes, e.g., funds resulting from fines and court actions, payments from utility companies for crossing State wetlands, compensation payment for use of State property, and fees for mitigation of resources not regulated by the Corps. MDE has used the Programmatic Funds to successfully complete more wetland mitigation than compensatory mitigation required based on the money accepted into the

MDE has received several State programmatic general permits from the U.S. Army Corps of Engineers (USACE). Activities authorized by MDE may receive a concurrent approval from the USACE for qualifying activities.

The Critical Area of the Chesapeake and Coastal Bays Act and Authority

Maryland's General Assembly enacted the Chesapeake Bay Critical Area Protection Act (Critical Area Act; the Act) in 1984, in response to the findings of a study commissioned by the USEPA. This study determined that unmitigated population growth and unsustainable development practices in the Chesapeake Bay watershed had led to a substantial decline in the quality of its waters and habitat, and the health of populations of living resources therein. The Act established the Critical Area Commission (CAC) and charged it with developing a resource protection program, and associated performance criteria, to counteract the effects of stressors to the Bay's health. The following objectives were outlined in the Act:

- Minimize adverse impacts on water quality from point sources and runoff
- Conserve fish, wildlife and plant habitat
- Establish land use policies that accommodate growth while addressing its potential impacts

The Critical Area Law was amended in 2002 to include the Atlantic Coastal Bays (Assawoman, Isle of Wight, Sinepuxent, Newport and Chincoteague Bays) to address similar concerns in its watershed.

IMPLEMENTATION

Although the Critical Area Law and associated regulations are Statewide requirements, the Critical Area program is actually implemented at the local level. The Law mandated that each local jurisdiction develop its own Critical Area Program, with oversight provided by the Critical Area Commission. The localities have established Programs by incorporating Critical Area requirements into existing zoning ordinances and codes, creating new zoning ordinances and codes specific to the Critical Area, or creating stand-alone requirements. Local jurisdictions are required by law to perform a comprehensive program review every six (6) years. In addition, the Commission has regulatory authority and may change statewide requirements through the regulatory process.

GENERAL PRINCIPLES

In passing the Critical Area Law, the Maryland General Assembly found that there is a substantial state interest for the benefit of current and future generations in fostering more sensitive development in shoreline areas along the Chesapeake and Atlantic Coastal Bays. **The “Critical**

Programmatic Fund. MDE will continue to utilize the Programmatic Funds to meet Maryland's goal of No-NetLoss of wetland acreage and function by completing wetland mitigation for smaller impacts not requiring permittee mitigation. MDE will separate this Programmatic Fund from the ILF Program Fund. The ILF Program Fund will include money accepted for compensatory mitigation required by the Department of the Army permits after the approval of the ILF Instrument.

Area” consists of all land and water areas within 1,000 feet of tidal wetlands or tidal waters as well as all waters of and lands under the Chesapeake and Atlantic Coastal Bays and their tributaries.

Within the 1,000 foot Critical Area, the Law also designates the first 100 feet – the Critical Area Buffer – as especially sensitive to impacts. When properly conserved, this Critical Area Buffer serves as a transition zone between the Bays or adjacent wetlands and neighboring developed areas. In addition to providing rich habitat for living organisms, when aptly vegetated, the transition zone or “Buffer” serves to slow the velocity of stormwater runoff to the Bays, thereby promoting infiltration and reducing the volume of stormwater received.

In addition to establishing appropriate land uses in the Critical Area, as discussed in the Criteria section below, the Critical Area regulations encourage the protection of rapidly eroding shorelines so as to prevent unnecessary inputs of sediment, and the nutrients and contaminants it may carry, into the State’s waters.. The Critical Area Law is consistent with the Living Shoreline Act in that it requires nonstructural shoreline stabilization measures to protect a person’s property against erosion, except in areas where the person can demonstrate to the satisfaction of MDE that these measures are not feasible.

The CAC has updated shoreline data for most of the coastal counties generated by Salisbury University.

DEVELOPMENT LIMITATIONS AND CRITERIA

Although some development activities are prohibited anywhere in the Critical Area (e.g. solid waste landfills, hazardous waste disposal facilities), development and redevelopment activities on property within the Critical Area are based on the designation of the affected property as one of three land use classifications: Intensely Developed Area (IDA), Limited Development Area (LDA), or Resource Conservation Area (RCA). Local jurisdictions mapped their entire Critical Area upon Program adoption based on land use as of 1985 (for Chesapeake shorelines) or 2002 (for Coastal Bays shorelines).

Intensely Developed Areas

IDA is a land use classification assigned to areas of concentrated development where natural habitat is sparse and the management focus is on protecting water quality via enhanced stormwater management. Examples of IDAs include the city dock area of Annapolis, the City of Baltimore, the Town of Ocean City and pockets of commercial or industrial uses along the shoreline. Approximately 5% of the Critical Area is designated IDA.

Limited Development Areas

LDA is a land use classification assigned to areas of low to moderate existing development where habitat is present and runoff is not substantially altered or impaired. Approximately 15% of the Critical Area is designated as LDA and it is a typical “suburban” landscape of moderately sized residential lots with occasional commercial development. Provisions to protect riparian habitats and water quality within the LDA include:

- The quality of runoff and groundwater entering the Bays and their tributaries must be maintained or improved.

- To recognize the benefits of forests, the total acreage of forest cover within the Critical Area shall be maintained or increased. Any clearing requires replacement sufficient to ensure the total acreage within a jurisdiction in the Critical Area is maintained and, preferably, increased.
- In areas of new development or redevelopment where no or limited forest cover exists, 15% of the area must be planted with trees or developed woodland vegetation.
- No development is allowed on slopes 15 percent or greater.
- To address the impacts of lot coverage (i.e., impervious surfaces) on streams, wetlands and the Bays, lot coverage is generally limited to 15% of a site.

Resource Conservation Areas

RCA is a land classification assigned to areas that are predominantly undeveloped, and natural features, such as wetlands, forests and fields, predominate. Nearly 80% of the total acreage of Critical Area is designated RCA. The RCA carries the most restrictive criteria related to development or redevelopment projects:

- All criteria applicable to the LDA are also applicable to the RCA.
- Residential density is limited to one (1) dwelling unit per 20 acres.
- New commercial, industrial, and institutional facilities are prohibited.

Habitat Protection Areas

In addition to the land use restrictions placed on development and redevelopment in each of the three Critical Area designations, there are additional areas within the Critical Area that are specifically identified as being important for the future health of the Chesapeake and Coastal Bays. These include the following:

- **The Buffer:** An area of at least 100 feet landward of tidal waters or tidal wetlands that is meant to provide for the removal or reduction of sediments and nutrients from runoff; to minimize the effects of human activities on wetlands, shorelines and aquatic resources; to maintain an area of transitional habitat between aquatic and upland communities; to maintain the natural environment of streams; and to protect riparian wildlife habitat. The 100-foot Buffer is expanded further for adjacent sensitive lands such as steep slopes, hydric or highly erodible soils, and nontidal wetlands. The Buffer is a minimum of 200 feet on new subdivisions within the RCA. **Even if there is existing development along the shoreline, there is still a Buffer on each and every property.**

Unless a variance is obtained, development activities within the 100-foot Buffer are generally limited to those that are water dependent (dependent on the water as part of the intrinsic nature of its operation - e.g. ports, marinas, public piers and pier access, public water access and beaches, boat ramps, stormwater outfalls), necessary for the installation of a shoreline erosion control measure, and/or authorized by an approved Buffer Management Plan (e.g. pruning, invasive species control). While these activities may be permitted, they may only occur after local approval of a site plan, building permit and always a Buffer Management Plan. Mitigation is required as described further below. The Critical Area regulations allow local jurisdictions to map certain areas along the shoreline as “Modified Buffer Areas” (also known as Buffer Exemptions Areas, Buffer Management Areas or Buffer Modification Areas). These are areas of Buffer that were heavily developed prior to the Critical Area Act implementation, and do not perform the intended function of the Buffer due to existing structures and activities. They are

excluded from the 100-foot Buffer development limitations but instead are subject to different standards for development and redevelopment. Mitigation that would promote water quality and habitat improvements in such areas is typically required.

In addition to the mitigation requirements listed above, the mitigation required for tree removal is based on the total square footage of tree canopy removed.

- **Nontidal Wetlands:** While MDE has regulatory authority to regulate development activities in nontidal wetlands statewide, these resources are also identified as habitat protection areas when located within the Critical Area. Local jurisdictions have the authority to require a supplemental Critical Area variance when nontidal wetlands within the Critical Area are proposed to be disturbed. In addition, when nontidal wetlands are contiguous to the Critical Area Buffer, the protections of the Buffer extend over the nontidal wetlands.
- **Threatened and Endangered Species and Species in Need of Conservation:** State and Federally protected species – fish, wildlife and plants – are identified as Habitat Protection Areas throughout the Critical Area. If such species are present on a site, resource agencies including the Department of Natural Resources and the U.S. Fish and Wildlife Service work with the applicant to ensure protection of the species of concern. In addition to species protected under Federal law, the Critical Area Program requires increased consideration for State Species of Special Concern. Protection measures are pre-determined for some affected species, while others require site specific plans to be developed in cooperation with local government and state and Federal natural resource agencies. Typically, habitats of these species are identified during the permit review process.
- **Other significant plant and wildlife habitats:** The Critical Area regulations also designate other unique areas as Habitat Protection Areas. These include large contiguous forests that provide habitat for forest interior dwelling birds, colonial water bird nesting sites (e.g., a great blue heron rookery), historic waterfowl staging and concentration areas, natural heritage areas and other areas as may be designated by a local jurisdiction.

Maps prepared by the Maryland Department of Natural Resources (MDDNR) can be referenced for use in initial site screening for managed species of fish, wildlife and plants: <http://www.mdmerlin.net/> However, formal consultation with MDDNR is required to determine species protection measure requirements, if any, on sites proposed for new development.

- **Anadromous fish propagation waters:** Anadromous fish are those species that migrate from their primary ocean habitat to freshwater areas for the purpose of spawning. These “waters” are streams in the Critical Area where rockfish, yellow perch, white perch, shad and river herring spawn. The streams are designated as such by MDDNR and are identified in the permitting process. Measures to protect these streams include:
 - The installation of concrete riprap and other artificial surfaces onto the bottom of natural streams is prohibited without demonstration of improvement to water quality and fisheries habitat in coordination with the project.
 - Channelization or other physical alteration of streams that changes circulation and interferes with fish movement is prohibited.

- Construction of dams and other structures that interfere with the movement of spawning fish and fish larvae are prohibited.
- Construction, repair and maintenance of roads, bridges and utilities is prohibited between March 1 and May 15.

Additional Considerations for Water-Dependent Facilities

Water-dependent facilities means those structures associated with industrial, maritime, recreational, educational or fisheries activities that require location at or near the shoreline. In order to protect water quality and shoreline habitats, water-dependent facilities must meet the following general criteria in order to be located within the 100-foot Buffer:

- The facility must meet a recognized private right or public need. (*Note: individual, private piers are not regulated under the Critical Area's regulations for water-dependent facilities.*)
- Adverse impacts to water quality and fish and wildlife habitat must be minimized.
- Non-water dependent components of the project (e.g. restrooms, restaurants, concession stands) must be located outside the Buffer.
- Additional requirements designated by the locality must be met.

Dredging

Dredging must be conducted in a manner that causes the least disturbance to water quality and habitats. **Dredged material cannot be placed in the Buffer unless it is part of a shore erosion control measure or a beach re-nourishment project, or unless it will be placed in a previously-approved channel maintenance disposal area.** *Use-dependent Restrictions*

Additional siting restrictions and construction criteria are imposed, based on the intended use of the project:

- **Industrial and Port Facilities:**
 - Can only be located in IDAs that are designated as Buffer Exemption Areas.
- **Marinas and Other Commercial Maritime Facilities:**
 - Must meet State sanitary requirements and include considerations for minimizing discharge of bottom wash waters into tidal waters.
 - Can be located in an RCA only if they provide public access (if new construction).
 - Existing facilities – if already located within the RCA – can expand only by demonstrating no adverse effects to water quality or an overall net improvement to water quality at or leaving the site.
- **Community Piers and Other Non-Commercial Boating Facilities:**
 - Cannot involve the sale of goods or services, including food and fuel. ○ Must provide adequate sanitary facilities.
 - Must be community-owned and established and operated for the benefit of the residents of a platted and recorded riparian subdivision.
 - Must be designed with a single point of access through the Buffer and designed to minimize Buffer disturbance.
 - Are not permitted if individual piers are part of the project.

- Must have their slips limited in number by the length of the shoreline and the number of platted lots or dwellings in the Critical Area, as denoted in the Critical Area Law.
- **Public Beaches and Other Public Water-Oriented Recreation or Education Areas:**
 - Publicly owned boat launching and docking facilities and fishing piers may be permitted in the IDA.
 - These facilities may be permitted in the LDA and RCA provided that adequate sanitary facilities exist; service facilities are located outside of the Buffer; permeable surfaces are used to the extent practicable and disturbance to natural vegetation is minimized.
- **Research Areas:**
 - Facilities or activities operated by State, Federal, or local agencies or educational institutions may be permitted, if non water-dependent activities are located, to the extent possible – outside of the Buffer.
- **Fisheries Activities:**
 - Commercial fisheries facilities, including off-loading docks and landside structures associated with aquaculture operations may also be located within the Buffer in any Critical Area designation. The CAC has recommended that localities identify and protect areas with high aquaculture success potential.

SHORE EROSION CONTROL

Critical Area requirements for shore erosion control projects require applicants to provide a Buffer Management Plan and a signed Buffer Notification Form to MDE at the time of application for a tidal wetlands license. These documents, along with the full MDE application packet, are forwarded to the Critical Area Commission and the local jurisdiction for review. Ultimately, the Buffer Management Plan must be approved by the local jurisdiction prior to any site disturbance. A license will not be issued if MDE has not received the required documents. The Buffer Management Plan is the tool used at the local level to ensure that the shoreline area – from the landward extent of the Buffer out to the waterward reach of a shore erosion project – sees an overall environmental improvement rather than just a habitat tradeoff.

VIOLATIONS

The following activities are considered violations of the Critical Area Act if conducted without prior approval (permit, authorized variance, or Buffer Management Plan):

- Clearing, removing, cutting, burning or brush-hogging vegetation and/or trees in the Buffer.
- Clearing or cutting of trees anywhere in the Critical Area that exceeds approved limits.
- Building or grading within the Critical Area.
- Construction or placement of ancillary structures in the Buffer.

- Grading, filling, dumping, stockpiling of construction materials and other disturbances to the Buffer.
- Filling of tidal and nontidal wetlands.
- Construction of piers and pier structures (e.g. boathouses).
- Construction of shoreline erosion control measures.
- Clearing or destruction of marsh vegetation.

ENFORCEMENT

Amendments to the Critical Area Act allow for joint and several liability pertaining to violations of the Act. Enforcement actions can be brought against contractors, as well as property owners and/or any entity that can be established as having authorized or participated in the activity that constitutes the violation.

Upon discovery of a violation, local jurisdictions may stop project work and impose penalties for violations of the Critical Area Act. Penalties may include imprisonment of up to 90 days and/or a fine of up to \$10,000 per Critical Area violation with each violation of a provision of the Act (including disregard of a permit or plan requirement) constituting a separate violation and each day of non-compliance constituting a separate, actionable offense.

In addition to imposing penalties, the Critical Area Law authorizes localities to order the restoration of property and structures to their original/preconstruction condition AND *requires* them to impose mitigation to correct for lost resource function. The mitigation planting ratio for Critical Area violations is 4:1. Development of a Buffer Management Plan demonstrating how the Buffer will be restored with native vegetation and maintained as riparian habitat may also be required.

Localities are required to report Critical Area violations. The Chair of the CAC can also initiate a court action against a violator. Citizen reporting of violations is encouraged. Self reporting is recommended when an unintentional violation is realized as the locality may focus efforts on working with the violator to expedite compliance.

Maryland Wildlife Action Plan

These plans are required for all states to receive particular federal grants which support wildlife programs (State Wildlife Grants). The current State Wildlife Action Plan (SWAP) covers 2015-2025, as states are required to revise their plans at least every 10 years. Required components of the SWAP are: 1) identified species of greatest conservation need (rare, declining, and other species of concern); 2) key wildlife habitats that support species of greatest conservation need; 3) threats to target species and habitats, and conservation actions to address them; 4) monitoring of species and habitats; 5) performance monitoring for conservation actions; 6) description of how input on SWAP was coordinated with partners and the public; and 7) a description of the process for updating the SWAP in the future. The classification of habitats is

largely standardized for the northeast, as are categories for threats and recommended actions. Standardized key wildlife habitats are cross-referenced to the ecological classification in the “Natural Communities of Maryland” report. Rare natural communities and representative plant species of concern are also included in the SWAP, although the focus is on animal species.

Conservation Tools

The Maryland Department of Natural Resources has developed a new conservation tool to identify opportunities for the beneficial use of clean dredged sediments. Beneficial Use – Identifying Locations for Dredge (BUILD) is a mapping tool that will support the state’s Chesapeake Bay restoration efforts, protect infrastructure and investment, and enhance coastal resiliency. BUILD will assist governmental and non-governmental entities to synchronize the use of dredged material from navigation channels with projects that reduce flooding and storm risk impacts. Planners and engineers can save on costs that would otherwise be incurred to transport dredged material to an upland placement site or to bring fill material to a restoration site. BUILD provides access to various dredging and restoration datasets, including navigational channel depth surveys, potential restoration sites, upcoming navigational improvement projects and the state’s Wetlands and Waterways permit layer. More information is available at <https://dnr.maryland.gov/ccs/Pages/beneficial-use.aspx>

The Maryland Department of Natural Resources launched an innovative new tool (May 2018) to evaluate the conservation benefits and ecosystem “value” of every parcel of land across the state. The Parcel Evaluation Tool was designed to identify and prioritize the conservation and protection of ecologically important, sensitive, and valuable land and watershed resources in Maryland for use by the department, land conservation organizations and trusts, local and state planners, and individual property owners. The do-it-yourself tool incorporates the department’s latest mapping technologies and scoring formulas to determine areas of high-ecological and natural resources value. Users can create a Conservation Benefits and Ecosystem Service Assessment Report Card, which analyzes and rates individual parcels on a number of factors, including coastal resiliency, connectivity, habitat and more.

The National Oceanic and Atmospheric Administration (NOAA) Ecological Effects of Sea Level Rise (EESLR) program awarded \$250,000 (October 2019) to the Maryland Department of Natural Resources, George Mason University (GMU), and The Nature Conservancy to increase our understanding of the benefits of natural features, like marshes and aquatic vegetation, in reducing the effects of sea level rise, flooding, and storms. EESLR projects explore the vulnerability of natural ecosystems, evaluate the potential for natural structures to reduce coastal inundation, and develop best practices for the inclusion of ecosystems in coastal protection strategies.