

Appendix D. Conservation Plus (Land Policy BMPs) and Protection

Conservation Plus and Land Use Policy BMPs

1. Description of Phase III WIP strategies and why these were chosen

The Chesapeake Bay Land Change (CBLC) Model, and the choice by the CBP partnership to incorporate expected growth impacts into the Bay TMDL process, provides Maryland with an excellent opportunity to get credit for local and State land preservation efforts and resource-protective development requirements.

The CBLC model provides a baseline called “Current Zoning” (i.e., based on where development can happen, not on density restrictions) for how land use patterns are expected to look in Maryland in 2025; however, the baseline did not capture State or local existing land preservation programs or resource-protective development requirements. The CBLC model can run alternative 2025 scenarios to demonstrate how those baseline land use patterns would change given local and State level land conservation and land use programs and policies. Changes in land use patterns can result in less additional nutrient and sediment loads from growth between 2019-2025 than the baseline. These changes can be considered a land use policy BMP.

2. Background

Maryland's goal was to seek accurate CBLC model results for how future loads will change between 2019-2025 due to programs and policies, and to provide as much clarity as possible regarding the specific programs and policies that comprise the land use policy BMPs. These suite of BMPs can then be aggregated into a conservation plus scenario that is run through the modeling suite to calculate resulting load reductions.

Maryland assembled a team of State agencies involved with land conservation and land use (MDE, MDA, DNR, MDP, Maryland Environmental Trust (MET), and Maryland Agricultural Land Preservation Foundation (MALPF)). The team determined and then described the array of existing land conservation and land use requirements and policies in Maryland. Next, the team identified the geographic areas where each requirement and policy has its effect and drafted instructions to the CBP regarding how much of these areas are forecasted to be conserved between 2019-2025. After working with the CBP to determine the types of GIS and tabular data needed to model our conservation and land use programs, the team developed the data and completed other directions and tasks from the CBP to seek an accurate forecast of program impacts.

The team created two CBLC model scenarios:

1) A regulatory scenario, which captures existing local and State land use restrictions and requirements (e.g., county zoning, forest conservation requirements) and existing trends for land conservation programs 2019-2025; and 2) a policy scenario, which captures State policy efforts, such as goals for land conservation and compact development, that are not reflected in law or regulation.

Regulatory scenario

Growth and Density

1. Local Zoning
2. State-level density restrictions (e.g., Critical Area law)
3. Avoid Permanently Preserved Land

Land Conservation 2019-2025

1. State conservation programs (MALPF, MET, Rural Legacy, POS)
2. CREP easements for riparian buffers
3. Local programs

Development requirements

1. Forest Conservation Act, including forests and forest buffers
2. Wetland and wetland buffer preservation
3. Local development requirements that exceed State requirements

Policy scenario

Growth and Density

1. 75 percent compact development goal
2. Areas subject to a 1-meter sea level rise by 2100

Conservation Policies

1. Land within 100-year floodplain
2. Forested land within anti-degradation watersheds
3. Designated local agricultural preservation areas
4. Currently achieved conservation through the Forest Conservation Act

3. Overall Sector Load Reduction Summary for the Team's Phase III WIP Strategies

CBP results indicate a reduction of 83,449 lbs. of nitrogen and 5,617 lbs. of phosphorus for Maryland's Land Policy BMPs (Policy Scenario).

4. Key Challenges and Opportunities

Projecting land conservation gains, and defining growth management strategies and regulations at the State level builds on existing statewide programs, funding, regulations and policies.

Challenges exist incorporating conservation and growth management efforts at local scales due to wide variability across local jurisdictions, the CBLC cannot easily model differences between local and State resource-protective development requirements, and the degree of outreach needed to collect this information and translate it as a land use policy BMP element; however, Maryland has surveyed local governments and local land trusts to collect this information.

Many opportunities for complementing strategies developed by the natural land, agriculture and climate change teams can be found on lands protected through various local and State conservation programs. Ensuring that these lands are performing at their highest and best use possible should be a priority for the State, knowing that investments in Bay restoration are more likely to be maintained over the long-term in these areas since development of these lands is restricted. Currently, stateside POS conducts restoration assessments for lands under evaluation for acquisition and considers these opportunities desirable for meeting water quality goals. This practice, in addition to evaluating existing public lands and lands under easement protections for restoration opportunities, could be broadened to other local and State conservation programs.

5. Description of funding capacity for team strategies (Identify any funding gaps, Authorities, Costs)

Established under the DNR in 1969, [Program Open Space](#) (POS) symbolizes Maryland's long term commitment to conserving our natural resources while providing exceptional outdoor recreation opportunities for our citizens. Funding for POS typically comes from the collection of a 0.5 percent State property transfer tax and funds State land acquisitions and easements through stateside POS, Rural Legacy Program (RLP), MALPF, and Maryland's CREP. Funding is also provided to local governments for parks, playgrounds and other open space facilities. There is no reason to expect that POS funds will not be available for continued conservation efforts now and into the future. MET, funded through a combination of State funds and private donations, is a land trust that works directly with landowners, communities and citizen land trusts, and largely acquires easements through donations. A comprehensive description of [Maryland's Land Preservation Programs](#), prepared for the chair of the Senate Budget and Taxation Committee and the House Appropriations Committee is available for more information. Whenever possible, State funding is leveraged with funds from other sources including the federal Land and Water Conservation fund, Farm Bill, nonprofit organizations such as The Nature Conservancy or Trust for Public Lands, and through the resources available from local governments and land trusts.

Growth management and regulatory controls on land use change do not require implementation funding, but may be based on State regulatory authorities of MDE or DNR, in addition to those of local government. Policy and planning measures are voluntary and often benefit from technical and financial resources provided by the State or local governments.

6. Discussion/Identification of strategy Co-Benefits

Maintaining lands in their natural or rural State generates many important habitat, climate change adaptation and economic co-benefits, particularly when conservation efforts are directed towards lands with high ecological value and areas that are important for sustaining agricultural economies. Stateside POS directs its funding towards [GreenPrint Targeted Ecological Areas](#), which identifies the State's most ecologically valuable lands and waters. Areas of high aquatic and terrestrial biodiversity, forest lands exceptionally valuable for protecting water quality, wetlands important for coastal resilience and climate change adaptation areas for future wetlands are noted as key ecological benefits. The RLP, MET and CREP also use these indicators to inform easement actions. Agricultural landscapes have been noted for their role in supporting sustainable fisheries, particularly because aquatic stressors arising from impervious surfaces associated with development is minimized. Many of the most productive watersheds for striped bass production that occur on the Eastern Shore are dominated by agricultural land use.

Rural landscapes, conserved areas of high ecological value and urban forests maintained through the Forest Conservation Act also provide economic benefits to the citizens of Maryland. Natural resource based economies, such as agriculture, forestry, fishing, and hunting, contribute 26.5 billion dollars to the State's economy every year (Guy et al. 2017, OIA, 2018). These lands also generate economic benefits for ecosystem services that are not valued through traditional markets, but provide important public services. The [Accounting for Maryland's Ecosystem Services](#) framework provides economic values for seven non-market ecosystems services: 1) air pollution removal, 2) carbon sequestration, 3) nitrogen removal, 4) groundwater recharge, 5) surface water protection, 6) stormwater mitigation/flood prevention and 7) wildlife habitat provision. Currently, the 1.5 million acres of protected land in Maryland generate 4 billion dollars in ecosystem service benefits and reflect what society is willing to pay to retain these services and the costs associated with replacing them (Campbell et al. 2018).

References:

Guy, Sarah, Chambers, Dustin, Diriker, Memo. 2017. The Impact of Resource Based Industries on the Maryland Economy. BEACON at Salisbury University. Partially Funded by Maryland Agricultural and Resource-Based Industry Development Corporation (MARBIDCO)

Outdoor Industry Association (OIA). 2018. Maryland Outdoor Industry Economic Report. outdoorindustry.org/state/maryland/

Campbell, Elliott, Conn, Christine, Marks, Rachel. 2018. Accounting for Maryland's Ecosystem Services: Integrating the value of nature into decision making. Maryland DNR Publication Number 14-081518-92. dnr.maryland.gov/ccs/Pages/Ecosystem-Services.aspx

7. Future plans or considerations (i.e., beyond 2025) (Sustainability)

EPA's "Clarification of Accounting for Growth Expectations for the Phase III Watershed Implementation Plans (WIPs)" document (Feb. 5, 2019), provides the following guidance to help jurisdictions adaptively manage growth over time:

“Updating Observations of Land Use Change and 2025 “Current Zoning” baseline

Regular updates to the Chesapeake Bay land use data will inform an adaptive management approach to achieve pollution reduction targets and will constitute an important part of the process to verify the effects of land policy BMPs. Coarse-scale, “hot spots” of land use change (approx. ≥ 10 acres) will be observed every two years (with a 1 to 2-year lag) through the interpretation of satellite imagery. Fine-scale changes in land use (approx. ≥ 1 acre) will be observed every four years (with a two to three year lag) through the interpretation of aerial imagery. When available, these data will be provided to the jurisdictions to inform their two-year milestones and annual progress narratives, indicating the need for greater or lesser emphasis on BMPs for different sectors. The data will also be evaluated for use in updating the 2025 current zoning baseline. The 2025 baseline condition will be updated every odd year, coinciding with the two-year milestones, using the best available data (e.g., population and employment projections, protected lands, census of agriculture, and potentially new observed patterns of land use change). The updated baseline conditions will be used to inform the two-year milestones and annual progress assessments and to help the jurisdictions verify the effects of actions specified in their land policy BMPs. For example, updating the current zoning baseline in the summer of 2019 will inform 2019 and 2020 progress and the 2021-2022 milestones.

Annual Progress Reporting Recommendations

Every year, the Bay jurisdictions must report progress towards achieving the goals outlined in their WIPs and two-year milestones. Reporting progress has a narrative programmatic component and a quantitative component consisting of a table of approved BMPs that were implemented over the previous year. Implemented BMPs are combined with expected land use conditions in CAST to quantify their expected nutrient and sediment reductions. Land policy BMPs determine the expected land use conditions for 2025, and affect land use conditions for interim years between the latest mapped land uses (i.e., 2013) and 2025. Actions specified in the Phase III WIP to achieve the land policy BMPs adopted by each jurisdiction should not be included in the tables of implemented BMPs. However, verification of the land policy BMPs warrants narrative, programmatic and numeric reporting of actions implemented each year to ensure that the jurisdictions are on track to achieving them. For example, annual progress reporting might include documentation of acres of forest and farmland conserved by county, investments to expand wastewater infrastructure, issuance of new subdivision ordinances, or implementation of zoning regulations that protect riparian zones from development. Annual reporting of activities along with monitored changes in land use will help verify land policy BMP actions intended to reduce and minimize potential future increases in water pollution due to land use activities. The and Use Workgroup, Water Quality Goal Implementation Team and Management Board will be asked to clarify CBP partnership expectations about the level of detail needed to verify Land Policy BMP actions in annual progress narratives.

8. Describe any specific local engagement conducted and that will continue through the implementation process (recognizing the WIP local engagement team will draft the broader engagement strategy)

Maryland completed three approaches to obtain information from local governments and local land trusts to inform the conservation plus effort. Through the local WIP inventory meetings (September - October 2018) and through a separate survey (October 2018), MDP asked local governments to forecast the amount of forest and farmland between 2018 and 2025 that would be preserved through local purchase of development rights and/or transfer of development rights programs. Similarly, through a survey of local land trusts (September 2018), MET and MDP worked to identify the amount of land that private conservation organizations expected to protect between 2018 and 2025. In January 2019, Maryland surveyed local governments to identify development requirements (e.g., stream buffer requirements) that exceeded State development requirements.

Water Quality and Aquatic Resource Protection Programs

Background

It is important to remember that Maryland's WQS establish not only the minimum water quality that must be maintained in our waterways, but also include an antidegradation policy whereby protection is afforded to waters that are better than the minimum required standard. As various levels of government focus on Chesapeake Bay restoration goals and meeting pollution reduction targets, it is critical that water quality protection efforts are not neglected and jeopardize progress made on other fronts. To prevent backsliding or unintentional degradation of upstream resources, Bay restoration efforts should not only focus on reducing nutrients and sediments, without protecting our healthy waters and living resources. Aligning the Phase III WIP protection strategies for high quality and/or high value resources with existing water quality management programs that are already providing oversight of these resources will help to maintain water quality gains downstream in the Bay, and increase both watershed ecological and climate resilience. Although the strategies listed are of benefit to most streams, the non-tidal stream resources considered to be high value and high quality for the purpose of this document are: drinking water sources; Tier II high quality streams; trout fisheries; natural heritage areas; rare, threatened, and endangered species; anadromous fish; and non-tidal wetlands.

Though the focus of the protection strategies are to promote the protection of vital high quality/value non-tidal resources, this is not intended to dismiss the need to address tidal resources. Tidal resources are more difficult to specifically target through direct place-based management because they are cumulatively impacted by stressors from both upstream and downstream sources. Regardless, the protection of vital freshwaters will have many positive water quality impacts on both nearby non-tidal freshwaters and the downstream tidal waters of the Chesapeake Bay and its tributaries.

Protection Strategies

1. Develop guidance, products, and factsheets

Rationale: Guidance documents, products, and factsheets can be a simple and effective way to encourage consistent implementation of protection measures across the State. Guidance is also a valuable education tool to help link the co-benefits of certain restoration actions for protection.

Tasks:

- Identify existing guidance documentation and elevate the level of awareness for underutilized, but useful resources.
- Identify existing resource screening and evaluation tools. Review to determine if all high quality/high value resources are adequately incorporated.
- Coordinate the co-development of guidance, products, or factsheets by State environmental and natural resource agencies to identify opportunities for protecting multiple high quality/high value water resources.
- Align products with county needs and ongoing initiatives.

2. Coordinate outreach and unify messaging

Rationale: The Chesapeake Bay WIP provides a unique opportunity to coordinate individual federal and State water resource protection efforts, and encourage broader goal alignment.

Tasks:

- Beginning with State environmental and resource agencies, compile a comprehensive list of water resource protection outreach opportunities, and the timing of each opportunity, while prioritizing the opportunities that will a) benefit multiple resources, b) reach a large audience, or c) have a high potential for overlap with current Bay restoration actions (e.g., MS4 permit monitoring requirements and the monitoring of Tier II waters).
- Develop a methodology to identify existing and new opportunities to make protection outreach more efficient, and provide a consistent, consolidated message from State agencies.
- Streamline outreach materials so that local governments have an easier-to-understand menu of resource protection options and partners to choose from.

3. Improve cross-jurisdictional cooperation and coordination

Rationale: High quality and high value non-tidal stream resources have distinct geographic extents, often spanning county boundaries. Strategies designed to make protection efforts consistent across jurisdictions will increase the overall resource protection benefit. Also, from a watershed perspective,

a more holistic approach to protection and restoration may result in a more efficient use of funding through joint efforts.

Tasks:

- Develop user-friendly GIS based and online products to relate where multiple resources occur and where such important areas cross county boundaries.
- Identify areas where the level of high quality/value resource protection could be strengthened across jurisdictional boundaries and explore opportunities for collaboration.

4. Better leverage work completed by the Maintain Healthy Watersheds Goal Implementation Team (GIT) into protection initiatives

Rationale: The GIT is currently conducting a preliminary healthy watersheds and vulnerability assessment for the Chesapeake Bay and \, State-identified healthy watersheds. The outcomes of this assessment should be used in the planning and implementation process alongside actions undertaken to meet Bay restoration goals.

Tasks:

- Provide outcomes to counties for use during the comprehensive planning process.
- Provide communities and public-private partnerships with guidance on scientifically supported actions on a stream segment-catchment scale to enhance protection beyond conservation and stream restoration, to address stream health, vulnerabilities and threats.
- Use outcomes to develop or improve MDE strategies for the protection of Tier II streams.

5. Streamline the Tier II Stream Review Process Across Key State Agencies

Rationale: MDE currently reviews all applications for impacts to Tier II streams; however, there are other State agencies that conduct environmental reviews for the same project. There have been several incidences where this independent review process has delayed permit issuance at one or both agencies (e.g. reviews related to energy and transportation projects, require additional review due to the potential for widespread impacts to streams and other watershed resources). Coordinated environmental reviews between agencies would minimize review times, and ensure a more complete and comprehensive review.

Tasks:

- Pilot study with one agency review program.
- Based on study outcome develop coordination plan, policies, conditions, etc.
- Identify and work with other relevant agencies to develop similar coordination plans.

6. Improve high quality resource protection at the county level

Rationale: To inform ongoing local comprehensive plan updates, new information and better science related to protection of healthy waters should be made available. Counties and municipalities should be encouraged and assisted with incorporating new knowledge and innovations into protection initiatives and Master plans. This would also help establish a minimum policy and protection threshold at the earliest stages of the planning process and streamline concurrent review activities.

Tasks:

- Develop guidance for local governments for updating comprehensive plans for consistency of language, up-to-date maps, web links, and basic healthy streams protection policy.
- Provide information for counties to address high quality water protection at each stage of the planning process.

7. Recommend new or modifications of existing legislation, regulation, policy, ordinances, etc.

Rationale: There are a myriad of programs, legislation, regulation, policy and ordinances that directly and indirectly confer protection to high quality or high value non-tidal resources, often with one program providing multiple benefits. However, these programs, laws, regulations and policies may not address all the necessary protection gaps. In addition, current regulations should be revisited to ensure efficiency, avoid future issues, correct past pitfalls and introduce novel ways to make both protection and restoration gains.

Tasks:

- Work with stakeholders to identify protection gaps, discuss possible methods and capacity to address protection gaps, and identify economic and environmental consequences of those methods.
- Identify programs that offer some protection to each resource and evaluate the level of protection conferred.
- Identify gaps in protection.
- Facilitate discussion and formulation of new programs to address identified gaps in protection and key challenges.
- Prioritize recommendations based on this information.

Key Protection Challenges and Gaps

Tier II anti-degradation waters: inconsistent implementation of comprehensive Tier II policies and requirements at local levels; resource-limited outreach, and limited dedicated staff. There needs to be a strategy to systematically introduce Tier II stream protections earlier in the local planning process, and within relevant county and local ordinances and laws like resource protection zones. There are several existing programs, legislation, regulation, policy, ordinances, etc. that align well with tier protection, and such relationships could be more intentional. However, it is often very difficult to modify legislation.

Being based on biological condition, there is difficulty in relating Tier II impacts to discrete discharge parameters and specific pollutants.

Anadromous Fish: Several anadromous finfish species depend on healthy waters in the Bay to maintain healthy populations. Recent studies conducted by Uphoff et al. (2006-2017) have documented declines in spawning habitat compared to historical distributions. Survival of early life stages greatly influences sustainability of a population, as declines in survival of eggs and larvae limit recruitment of adults into the population. Persistent losses over time can reduce resiliency of a population and limit its sustainability. For these reasons and more, habitat is a key factor in the success of early life stages. Expanding development and specifically the associated impervious surfaces threatens the suitability of anadromous fish habitat. New measures, limiting the expansion of impervious surfaces in high quality/value habitats may be needed to protect existing stocks of anadromous fish. Using information from various studies, DNR has mapped high priority watersheds where conservation of rural lands is an effective strategy to promote protection of spawning habitat.

Universal gaps and challenges: The greatest challenge is how to account for the impacts of permanent land use conversion on high water quality and high value resources. With so many resources being dedicated towards Bay restoration, protection is often considered a separate process, yet protection and restoration are synergistic. There are gaps in understanding how some BMPs confer multiple protections, providing water quality benefits that may outweigh a less costly, narrowly applied practice. For example, the most favorable cost-to-credit ratio may skew preferred sites to more downstream locations in target watersheds, rather than nearer to the headwaters where strategically placed practices could be more effective long term by addressing problems closer to the source. Although it is a constant challenge to better quantify these benefits within the BMP selection framework, doing so will help address not only Bay restoration efforts, but also prevent localized degradation, net resource loss, and address local TMDLs. Maryland will begin to overcome this challenge when fifth generation MS4 permits are revised in 2019 to incentivize credits for BMPs that maximize impact on all ecological concerns, not just nutrients and sediment. High quality resources have geographic extents, which often cross jurisdictional boundaries and more interjurisdictional collaboration is necessary for consistent and effective levels of protection. Limited funding and staff highlight the need for more intentional collaborative work, education, and new strategies that best encourage a holistic approach to protecting water quality.

Cross-team Considerations and/or Challenges: There needs to be a way to represent the true value of protection of non-tidal water quality within the BMP selection framework, so as not to sacrifice biological and chemical quality upstream to maximize nutrient and sediment load reductions downstream. Balance is required, and there are local TMDLs, impairments, and resource losses that could mutually be addressed. While stormwater controls for nontidal TMDLs are essential components of Maryland's WIP, thus far there is no cross sector mechanism or series of mechanisms to address net losses of natural assets that support high quality/high value streams and resources.

Funding Capacity

Some of these strategies can be implemented with existing resources. Others may require direct funding sources, which have not yet been identified. It is also hard to estimate the cost associated with strategy

implementation until more refined areas of guidance, factsheets, products, documentation, outreach materials and actions are developed. Leveraging existing programs, etc., where possible will make implementation more feasible.

Co-benefits

1. Bay Restoration: Forest cover and riparian buffers help meet sediment and nutrient reduction goals.
2. Climate Change: Maturing forests act as CO₂ sinks, and offer stability to offset the “heat island” effect while buffers cool streams protecting in-stream aquatic organisms.
3. Resilience: Protection can improve flood control, promote stream stabilization and regulation of hydrologic flows, and recovery after storms and major weather events.
4. Economics: Protection of upstream high quality waters and resources is more economically sustainable than having to engineer restoration solutions. According to EPA, the cost per pound of nitrogen reduction is \$3.10 for a forest buffer vs. \$8.56 for wastewater treatment in the Bay watershed (2012).
5. Local Government Support: Strategies compliment local government programs, core commitments, goals and initiatives including addressing local impairment issues and TMDLs.

Future plans/considerations: Future plans or considerations (i.e., beyond 2025) (Sustainability)

1. Develop framework for updates and ways to better track progress.
2. Develop further justification for protection based on natural resource-based economics.
3. Develop watershed-specific high-quality vulnerability and health strategies for each county to encourage joint protection actions.
4. Identify and or develop funding sources to support strategy implementation.
5. Develop a process to take the list of potential cross-jurisdictional protection opportunities and conduct a pilot study. Use this as a template for scaling similar actions across the Bay watershed.

Specific Local Engagement

Tier II anti-degradation reviews provide an opportunity to inform the public about high quality waters protection. Web resources, presentations, publications, etc. are continually produced by State agencies and are generally focused on one particular resource such as brook trout. The Healthy Watersheds Bay Program cohort includes several goal teams that focus on fish habitat, fish passage, streams, etc., and teams conduct outreach through public meetings, workshops, presentations, publications and web products.

Figure 3-6 represents high quality stream and resource density across the State of Maryland. The grey areas to the west of the Bay primarily represent drinking water sources, while those to the east of the Bay represent anadromous fish priority streams. Brown, green, or blue areas indicate locations with the highest density of high quality resources. There are high density – high quality areas located in every county in Maryland.

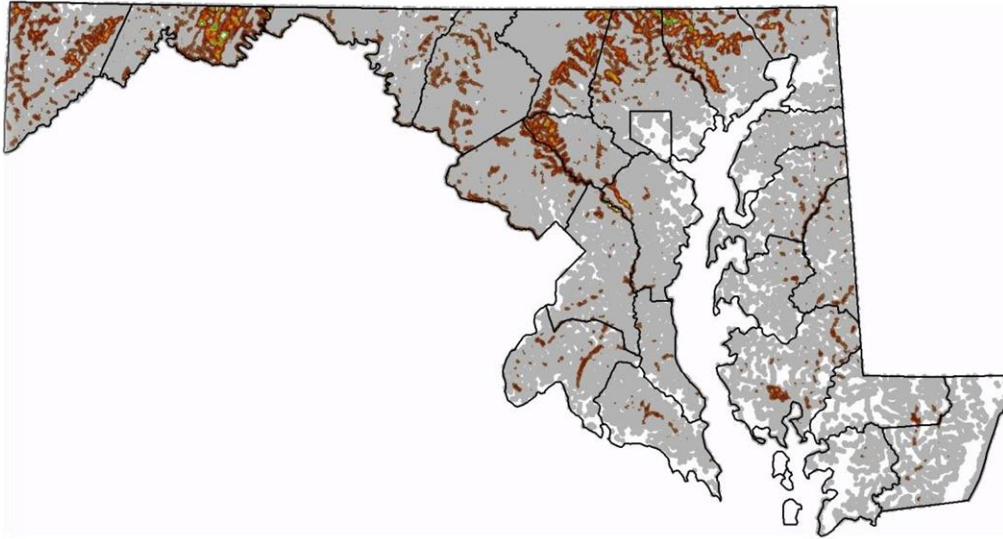


Figure D-1: High quality stream and resource density in Maryland.

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