Healthy Watersheds Outcome

Management Strategy

2018–2025, v.2

Wetlands flow into the Chesapeake Bay near the mouth of the Elk River in Cecil County, Md., on June 27, 2016. (Photo by Will Parson/Chesapeake Bay Program with aerial support by LightHawk)

I. Introduction

Ensuring the long-term conservation of healthy watersheds is critical to the health of the Chesapeake Bay and the surrounding region. Healthy watersheds are an insurance policy for the Bay: they provide resilience to the watershed by delivering clean water and critical habitat while we seek to restore areas that have been degraded. Healthy watersheds also provide numerous social and economic benefits to local communities; they are often sources of drinking water, provide wildlife habitat, help to mitigate the effects of flooding, support a wide range of recreational opportunities, and are more resilient to the effects of invasive species and climate change. Healthy watersheds are also a bargain: protecting them is much less expensive than restoring waters that have become degraded.

Strategies to ensure the long-term conservation of healthy watersheds, as developed by the Chesapeake Bay Program, focus on four areas: 1) tracking the health of watersheds and our effectiveness in protecting them, 2) strengthening local commitment and capacity to protect healthy watersheds,

3) improving protection of state-identified healthy watersheds under federal programs and federal agency decision-making, and 4) supporting state-based efforts to improve assessment and protection of healthy watersheds.

II. Goal, Outcome and Baseline

This management strategy identifies approaches for achieving the following goal and outcome:

Healthy Watersheds Goal

Sustain state-identified healthy waters and watersheds recognized for their high quality and/or high ecological value.

Healthy Watersheds Outcome

100 percent of state-identified currently healthy waters and watersheds remain healthy.

Baseline and Current Condition

Protecting healthy watersheds is the natural complement to cleaning up those that have become degraded (e.g., through the establishment and implementation of the Chesapeake Bay Total Maximum Daily Load (TMDL)). Activities that protect healthy waters and watersheds–including land conservation, local ordinances, anti-degradation policies, and other measures–often cost less and can be more effective at maintaining health than restoration.

Due to varying definitions of "healthy watershed," the Maintain Healthy Watersheds Goal Implementation Team (goal team) made the strategic decision to not seek a common definition for the healthy waters and watersheds addressed in this Outcome. Each jurisdiction has its own individual programs and responsibilities for watershed protection. Honoring states' preferences, the goal team chose to move forward by focusing on tracking and supporting state-identified currently healthy waters and watersheds.

Individual state definitions for healthy waters and watersheds as well as a preliminary draft baseline map of state-identified healthy waters and watersheds are available online. The goal team is currently refining the state-identified healthy watersheds dataset and the baseline will be set when the map is updated and completed, most likely in late 2015. A summary of individual state definitions can also be reviewed in Section V of this management strategy. Note: Updated information will be maintained online, as refined by states.

It should be noted that watershed health across the Bay region currently ranges from impaired (i.e., not meeting the numeric/narrative criteria that support beneficial use designations) to exceptional/outstanding (i.e., reference reaches, some Tier 3 waters). The activities included in this strategy seek to sustain watershed health where it is high, exceptional, and/or outstanding, and to increase the overall number of healthy watersheds in the future. The goal of sustaining state-identified healthy waters and watersheds to the extent that 100 percent of them remain healthy is aspirational, but achievable.

III. Participating Partners

As noted above, each partner cooperating to achieve healthy watershed goals has unique policies, procedures, tools, and other resources. Each will apply their own internal methods, programs, and policies in support of the healthy watersheds goal. All partners listed below will cooperate, to the extent their resources will allow, in building a coordinated approach.

- State of Delaware
- District of Columbia
- State of Maryland
- State of New York
- Commonwealth of Pennsylvania
- Commonwealth of Virginia
- State of West Virginia
- Chesapeake Bay Commission
- National Oceanic and Atmospheric Administration (NOAA)
- National Park Service (NPS)
- U.S. Army Corps of Engineers (USACE)
- U.S. Environmental Protection Agency (EPA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Forest Service (USFS)
- U.S. Geological Survey (USGS)
- The Nature Conservancy (TNC)
- Local Jurisdiction Partners

Local Engagement

While state, federal, and regional partners can provide important support for healthy watersheds protection, local governments, watershed associations, nonprofits, and private sector entities also play key roles. Private land trusts, nature preserves, conservation organizations, and other non-governmental entities can often move quickly to protect targeted and available lands through direct purchase or acquisition of easements, development rights, or other means. These organizations often partner with local, state, and federal agencies, and typically provide a sustained level of real-world focus for localized efforts to protect healthy waters and watersheds.

Local governments also have the ability to protect sources of drinking water and preserve lands valued highly by the public as nature preserves, parks, greenways, recreational areas, and wildlife habitat. Local tools for healthy watershed protection include planning (comprehensive, park and recreation, transportation, economic development, water resources, etc.); official maps; land use regulations including sub-division and land development and zoning; land and easement purchases; post construction stormwater management and mitigation requirements; and a variety of other tools.

IV. Factors Influencing Success

1. **Human and Natural Factors (Population Growth)**
   A wide range of natural and human factors influence the attainment of the healthy watersheds protection goal, though many "natural" factors may have human primary/secondary causes. For example, air quality and air deposition, climate change, and invasive species are all associated to some degree with past and current human activities. Likewise, changing stream flow regimes and channel stability are often linked to human induced land use changes in the watershed.

2. **Federal, State and Local Regulatory Framework (Engagement)**
   Increasing urban development, including transportation infrastructure is the most significant influence on watershed health through changing land use and other habitat modifications. The regulatory landscape, resources of public and private sector organizations, and degree of support at the local and state levels represent key factors that influence the partnership's capacity to protect healthy watersheds. These factors can be summarized into two key themes: a) knowledge about the status of healthy waters/watersheds, and b) cumulative action, with a focus on local engagement, state and federal actors. Each is addressed below.

   a. **Information about the status of healthy waters/watersheds (Scientific and Technical Understanding)**
      Information is a key factor influencing our ability to meet this goal. This information is key to assess and guide action, and determine:
      - Where healthy watersheds are (what is our baseline?)
      - How their status changes over time (are we achieving the goal?)
      - Which healthy watersheds are most vulnerable to degradation (where should we invest limited resources?)
      - How effective are our management strategies at sustaining healthy watersheds (are our investments working?)

   b. **Cumulative action, with a focus on local engagement, state and federal actors (Government and Legislative Engagement and Partner Coordination)**
      Achieving this outcome will not happen through any one mechanism or stakeholder. Rather, multiple actions are needed from a diversity of entities to ensure healthy watershed protection. Actions can include regulatory and non-regulatory programs at the State and Federal level, ranging from basic anti-degradation and permit program safeguards to land and easement purchases to educational programs. While there are many excellent examples of healthy watershed protection initiatives in the Chesapeake Bay region, these actions often occur in isolation.

      State and federal actors can greatly affect the protection of a healthy watershed, and routinely review significant actions on the ground which alter land use, and issue National Pollution Discharge Elimination System (NPDES) permits and Section 404 Clean Water Act (CWA) permits related to dredge and fill, state CWA 401 water quality compliance certifications, Federal Energy Regulatory (FERC) permits (e.g. for drilling, natural gas extraction and conveyance, pipelines, compressor stations, and other energy-

related infrastructure), highway and other transportation-related Environmental Impact Statement (EIS) and funding decisions; and make other, related findings that cumulatively have a substantial influence on the health of watersheds.

In assessing the range of factors influencing our ability to meet this goal, land use change---specifically the amount, type, and way in which land use change occurs---is the single biggest factor impacting healthy watersheds. Local governments, planning district commissions and watershed organizations are often the key factor in healthy watershed protection because of their role in local land use decisions. Ensuring that those officials making the land use decisions and those organizations and entities influencing those decisions have the best information on healthy watersheds is essential to achieve this goal. Our collective work should, include development of information needs described above; enhancement of scientific, technical, and policy tools; and a process for educating, engaging, and involving local communities in healthy watershed protection.

V. Current Efforts and Gaps

State and local governments have many of the framework elements in place to protect healthy and high quality waters, and have been doing so for many years. These framework elements include broad policies, requirements, land use provisions and programs that acquire – through donation or purchase – designated lands, conservation easements, or development rights to ensure key critical areas retain their ability to infiltrate precipitation, moderate runoff, trap pollutants, stabilize channels, and provide habitat for aquatic and terrestrial species.

However, there are gaps in these current efforts. Many watersheds are not monitored, assessed, or considered by managers unless there is some activity regarding a change in status – a development proposal, a new wastewater plant, a dredge/fill permit application, a new roadway, timber harvest and other proposed activities. Inventory, assessment, and other information on healthy watersheds is often unavailable, and there is not an overarching framework to identify, characterize, prioritize, and protect vulnerable areas. In addition, enhancements are needed for the array of scientific, technical, and policy tools, and for approaches to engage and involve local jurisdictions in protection efforts. The following sections address current efforts and gaps and are organized under the subject headings of the management approaches outlined in Section VI.

Tracking: Where are healthy watersheds and how are they doing?

a) Inventory of Healthy Watersheds

All states have some level of physical and chemical monitoring data with which to assess watershed health. In addition, some states and federal agencies use online and remote sensing tools to collect additional information, such as land use/cover, riparian buffer width, location of conservation areas/practices, and other data. Comprehensive methods typically integrate a suite of analytical factors, such as water quality data, landscape condition, biota, ecological components, hydrology, geomorphology, and other factors. Some states in the Bay watershed are developing integrated watershed assessment methods. For example, Maryland is using GreenPrint to identify targeted ecological areas and fragmentation/development of natural and working lands. Virginia is using the

Interactive Stream Assessment Resource (INSTAR) to identify and rank healthy streams through a stream ecological integrity assessment procedure.

Gap:

The bulk of activity regarding the collection and use of watershed condition information has been used to characterize impaired watersheds for restoration, rather than to identify, characterize, and protect healthy watersheds.

Gap:

Currently, the status and importance of healthy watersheds are not being conveyed to local government decision makers and other organizations and entities consistently across all Chesapeake Bay jurisdictions. As a result, these local managers are not aware of the resources that are available nor what types of protective measures are needed to protect those resources.

b) Vulnerability Information

Healthy watersheds can be affected by residential, commercial, transportation, and other construction activities; energy resource development; water withdrawals; dams and other barriers; agricultural runoff, and other nonpoint sources of pollution. Vulnerability assessments that capture various risks to healthy watersheds and characterize them quantitatively and/or qualitatively can help managers prioritize areas according to risk and better target resources. The U.S. Geological Survey (USGS) and other government agencies have developed and deployed urban land use change and other models in the past, which could be refined and incorporated into a vulnerability assessment tool. The West Virginia Watershed Assessment Pilot Project–supported by U.S. Environmental Protection Agency (EPA) Region 3, the state's Department of Environmental Protection, and The Nature Conservancy–produced individual watershed reports and an interactive web tool that displays the results of the analysis and selected spatial data with attribute information for five sub-basin Hydrological Unit Code (8-digit HUCs). The ranking of planning units generated in the assessment can be used to identify and prioritize areas within the watershed for conservation, restoration, or mitigation activities, depending upon stakeholders' goals and resources.

Tetra Tech is working with EPA, HWGIT staff, and jurisdiction leads as part of a 2018 GIT funding project entitled The Preliminary State-Identified Healthy Watersheds Vulnerability Assessments for the Chesapeake Bay Watershed (PHWA). The aim of this project is to (1) identify, obtain, and integrate appropriate state data to augment the EPA assessment to summarize conditions of state-identified healthy watersheds, (2) identify state-identified healthy watershed vulnerabilities, and (3) develop an approach that can be utilized in the future to determine if state-identified healthy watersheds are being maintained. This project will help determine if the Healthy Watersheds outcome is being met and will help to understand and potentially begin to address specific healthy watershed vulnerabilities.

Gap:

Widespread assessments of healthy watershed vulnerability are not available. Vulnerability rankings can identify various tiers of risk–for example, through a five-point scale from very high to very low–by integrating parameters such as watershed condition, urban growth proximity/pressure, development trends, water demand forecasts, invasive species threats, upstream activities, land

ownership type and future plans, current transportation access, future transportation infrastructure plans, and other factors.

c) Prioritization for Protection

1. Prioritization approaches for healthy watershed protection efforts

With a database of healthy watersheds and information on their current condition, existing protections, and relative vulnerability, managers could begin to prioritize them in terms of risk and evaluate whether additional protective measures are warranted. For example, in most states high quality (i.e., Tier 2) waters can be degraded if the sponsors of a new or expanded activity (e.g., wastewater treatment plant, new development) can demonstrate 1) they have considered and ruled out possible alternatives, and 2) the project represents an important economic or social development. Allowable degradation cannot result in a loss of waterbody use(s), but can be significant nonetheless. Healthy watersheds with relatively weak protective measures and high vulnerability to near-term risks might be considered for additional protection, such as purchase by a land trust, enhanced effluent limitations, or application of development design standards that preserve important riparian and adjacent areas.

Gap:

Some level of prioritization within agencies and private sector organizations may exist, but the details are not clear, and the information may not be readily accessible or available to external parties.

2. Identification and application of protective measures for healthy watersheds facing high-level near-term risks

Watersheds that are high quality, exceptional, outstanding, or otherwise healthy and are subject to significant changes in land use or upstream impacts to water quality may require additional protective measures. Depending on specific circumstances, these measures may include outright purchase of land or easements (e.g., using Clean Water Act Section 319 funds or land trust donations), preservation of critical riparian and adjacent areas, more stringent stormwater management controls, nutrient removal onsite wastewater treatment systems, better animal waste management facilities, and enhanced permit requirements.

Gap:

The array of protective measures available vary across the states, and even within the states – i.e., some local jurisdictions may have significant resources and policy tools to address watershed risks, while others may not. Protection program elements vary, and may include habitat and stream corridor protection, conservation tax credits, landowner stewardship, sustainable forestry, in-stream flow and lake level controls, water resource policies, source water and groundwater protection, antidegradation, wetland protection, invasive species control, compliance monitoring, and other programs. While the potential tools for protection are numerous, they are not infinite: a list of such tools and where they are available can be assembled. This gap underscores the need to coordinate with the Land Use Options Evaluation Outcome.

d) Assessment Information

1. Characterization of existing protective measures for state-identified healthy watersheds

Healthy watersheds are protected by a number of Federal and State laws and regulations including additional anti-degradation protection for waters of a significantly better water quality, more stringent limits on discharges to state waters, and targeted land conservation. For example, state Clean Water Act Section 319 management plans are beginning to include elements of healthy watershed protection. Clean Water Act Section 404 "dredge and fill" discharge permits include requirements for avoiding, minimizing, or mitigating waterbody impacts, and offer "fee in lieu of mitigation" programs that often support restoration activities.

Gap:

These measures vary in their application across the Bay region, and can vary in their effectiveness. Private sector resources to identify and protect watersheds are scarce overall, especially in undeveloped rural areas where healthy watersheds may be found. Among regulatory safeguards, anti-degradation programs with strict requirements for alternatives analyses and quantified demonstrations of social and/or economic benefits for projects that may degrade water quality may be more effective than general permit programs, which typically don't conduct individual project reviews. Healthy watershed protection programs would benefit from some knowledge regarding the type and relative effectiveness of existing safeguards.

Local Leadership: Local commitment and capacity to protect their healthy watersheds

Local communities play a vital role in identifying and protecting highly valued waterways and watersheds. Lakes, rivers, streams, wetlands, estuaries, and coastal waters often benefit recreation, tourism, aesthetics, and water supply for homes, industry, and businesses. A variety of local stakeholders often influence watershed management. Planning, zoning, and public works professionals have a responsibility to ensure the economic vitality of their jurisdiction while maintaining such core functions as water quality and flood protection, stormwater management, source water protection and recreational opportunities. Local advocates may promote the designation or expansion of natural areas, greenways, green infrastructure, forested land, fisheries, and other assets. Real estate professionals and property owners often interests in maintaining these community assets. Unfortunately, the values associated with maintaining healthy watersheds have too often not been adequately or consistently conveyed to local communities, particularly to local decision makers.

Gap:

As local governments focus on addressing their core functions including education, public safety, land use decision making and complying with a variety of water quality requirements, they are seldom able to adequately identify and protect healthy watersheds. Both outreach and education will be needed to inform local governments, watershed organizations, and planning district commissions of the resources and tools available, and of how they might be applied locally. Outreach efforts will need to focus on 1) the importance and value of local waters, and 2) the tools that are available to protect local waters.

Federal and State Leadership:

a) Scientific, technical, and policy tools to identify, characterize, and protect healthy watersheds

The implementation of the activities described broadly in this strategy and detailed in the biennial workplans will require the use of various scientific, technical, and policy tools, such as watershed assessment methodologies, vulnerability analyses, and tailored packages of protective measures. Many of these tools are available now, and are being applied across the Bay region.

The Healthy Watersheds Forestry TMDL Forest Retention Study is an ongoing project currently in its third phase and designed specifically to begin to address this gap. This project engages local planners and other key stakeholders and assist them in policy and management of healthy waters and watersheds as well as serve as a model for the development of incentives for land conservation in healthy watersheds.

Gap:

The usage of existing tools is not universal, even within states. Furthermore, some tools are underdeveloped, poorly supported, and unsuited for widespread sharing and/or integration. The goal team has identified the following needs: creation of a forum for mutual learning and exploration of scientific and management issues; further development of information resources, including health and protection status tracking capabilities and support for communication about healthy watershed identification and protection; and promotion of the science that supports better characterization and protection of healthy watersheds.

b) Current State Efforts

The following are descriptions of jurisdictions' healthy waters and watersheds definitions. Contacts for each state are also listed.

Delaware: All of Delaware's tributaries to the Chesapeake Bay are impaired by nitrogen, phosphorus, and/or bacteria. Although they do not specifically define "healthy watersheds," being impaired is an indication that the watershed is not healthy. Delaware promulgated TMDL regulations for all of these tributaries long before the Bay TMDL and will not consider them to be unimpaired until they meet Delaware's Surface Water Quality Standards and no longer cause downstream impacts to the Chesapeake Bay.

District of Columbia: Washington, D.C. is primarily urbanized and therefore has not identified currently healthy watersheds. However, the District Department of the Environment (DDOE) has a number of laws and programs that focus on improving watershed health. These laws and programs include: storm water management, sediment and erosion control, and water quality regulations; incentive programs promoting the installation of best management practices; a RiverSmart Homes program; incentives for the installation of green roofs on buildings; and Bay-friendly tree planting events.

Maryland: Anti-degradation Tier II catchments will be used for Maryland's healthy watersheds data layer. This includes non-tidal watersheds under regulatory anti-degradation protection that exceed minimum applicable water quality criteria and standards. Currently, Tier II streams are identified according to fish and benthic indices of biotic integrity. Tier II streams are grouped into catchments and those with current Assimilative Capacity, or the natural capacity of a water body to dilute and

absorb pollutants and prevent harmful effects, are included in the Tier II catchments for what the state considers to be healthy watersheds.

New York: The Waterbody Inventory/Priority Waterbodies List (WI/PWL) is an inventory of the state's surface water quality. The category of "No Known Impact" represents "segments where monitoring data and information indicate that there are no use restrictions or other water quality impacts/issues" and is being used to determine New York's healthy waters and watersheds.

Pennsylvania: Designated or existing uses classified as Exceptional Value or High Quality are used as the basis for identifying Pennsylvania's healthy waters and watersheds.

High Quality Water
Chemistry meets water quality criteria at least 99 percent of the time for dissolved oxygen, iron, dissolved copper, temperature, dissolved nickel, dissolved cadmium, ammonia nitrogen, dissolved zinc, pH, dissolved arsenic, dissolved lead, and aluminum.

Biology – qualifiers for

1. Biological assessment – supports high quality aquatic community using peer reviewed biological assessment procedures (e.g., surface water is compared to reference stream or watershed and receives a benthic macroinvertebrate score of at least 83 percent)
2. Class A wild trout stream

Exceptional Value Water
Meets requirements of High Quality Water and…

- Is located in a National Wildlife Refuge
- Is located in a designated State Park or State Forest natural area, National Natural Landmark, federal or state wild river, federal wilderness area or national recreational area
- Is an outstanding national, state, regional or local resource water
- Is a surface water of exceptional recreational significance
- Achieves a benthic score of at least 92 percent compared to reference conditions
- Is a wilderness trout stream
- Is a surface water of exceptional ecological significance

Virginia: The Interactive Stream Assessment Resource (INSTAR) designates Virginia's healthiest watersheds. The goal of INSTAR is to develop a complementary, synoptic, and geospatial database for fish and macroinvertebrate community composition and abundance at stream locations throughout the state, including larger (fourth order or greater) non-wadeable streams and rivers.

INSTAR, and the extensive aquatic resources database on which it runs, supports a wide variety of stream assessment, management, and conservation activities aimed at restoring and protecting aquatic living resources throughout the Commonwealth.

West Virginia: West Virginia does not have a state-defined "healthy watersheds" program or definition. West Virginia's anti-degradation rule can be applied to help define this category of streams. West Virginia's Tier 3 waters are known as "outstanding national resource waters." These

include waters in Federal Wilderness Areas, specifically designated federal waters, and high quality waters or naturally reproducing trout streams in state parks, national parks, and national forests.

State contacts for tracking healthy watersheds and spatial data:

State	Contact
Delaware	Steve Williams (DNREC)
District of Columbia	Matt Robinson (DOEE)
Maryland	Angel Valdez (MDE)
New York	Lauren Townley (NYS DEC)
Pennsylvania	Scott Carney (PA DEP)
Virginia	Todd Janeski (VDCR)
West Virginia	Tim Craddock (WVDEP), Chad Thompson (WV DEP)

VI. Management Approaches

The Healthy Watersheds Goal and Outcome can only be achieved through the cumulative impact of a wide variety of actions undertaken by a multitude of actors at many scales. Recognizing this, our management approach is to focus on four key areas where the Chesapeake Bay Program's investments can make the highest contribution: 1) tracking the health of watersheds and our effectiveness in protecting them, 2) strengthening local commitment and capacity to protect healthy watersheds, 3) improving the protection of state-identified healthy watersheds under federal programs and federal agency decision-making, and 4) supporting state-based efforts to improve the assessment and protection of healthy watersheds.

These actions address high priority influencing factors and gaps, *and* take advantage of the unique strengths of the partnership: cross-management strategy coordination, alignment for multiple benefits, analysis and data products at a Bay-wide scale, and access to/connection to federal agencies. The first three approaches, driven by partnership investments, will be complemented by actions that states may undertake unilaterally, such as improving the assessment and monitoring of healthy watersheds, strengthening the implementation of anti-degradation and other regulatory programs, and better targeting land protection programs. The partnership provides a valuable forum for mutual learning and exploration of scientific and management issues that can support state efforts in these areas.

The goal team will work together to carry out the following actions and strategies to achieve the Healthy Watersheds Goal. These approaches seek to address the factors affecting our ability to meet the goal and the gaps identified above. Specific tasks for each activity will be listed in the biennial workplans developed for each strategy element.

Management Approach #1: Tracking: Where are healthy watersheds and how are they doing?
The goal team has formed a Tracking Workgroup of state and federal agencies and non-governmental organizations to further explore and refine tracking the health and protection status of state-identified healthy waters and watersheds. Several key actions have been identified and are listed below. A framework for tracking healthy watersheds and watershed protection could be thought as a four legged stool or feedback loop, including: 1) maps of state-identified healthy watersheds, 2) the best available

assessments of the vulnerability of those watersheds, 3) the most current information on protections that are in place to ensure the long-term sustainability of watershed health, and 4) analyses on land use change or other landscape characteristics to track the health and viability of the watersheds over time.

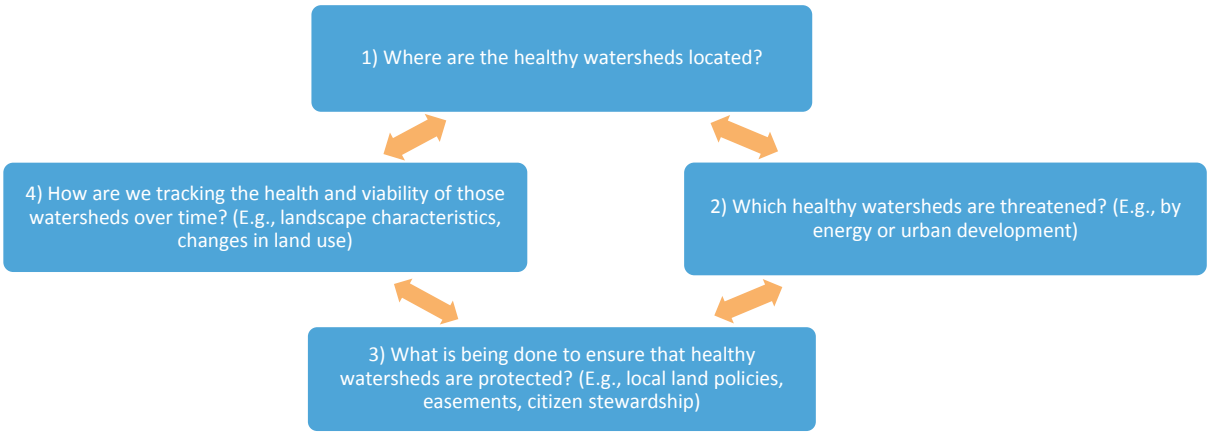

Figure 1. Conceptual diagram of healthy watersheds tracking functions.

- **Inventory of Healthy Watersheds** – Refine the baseline mapping dataset of state-identified healthy waters and watersheds. Information will be based on existing datasets maintained and provided by states (e.g., high quality, exceptional, outstanding waters and watersheds). Additional ancillary data will be utilized from information from other public and private sector entities, for informational purposes and context.
- **Vulnerability Information** – Develop and apply tools or methods that integrate various inputs to characterize watershed vulnerability to future high-level risks. Tools may consider watershed condition, urban growth proximity/pressure, energy development trends, water demand forecasts, invasive species threats, upstream activities, land ownership type and future plans, current transportation access, future transportation infrastructure plans, climate change and sea level rise, and other factors. Establish a framework for assessing the capacity of healthy watersheds to absorb additional cumulative impacts, and incorporate that framework into local, state and federal decision-making.
- **Prioritization for Protection** - Collaborate with other goal teams to compile information on state and federal land protection priorities and determine overlap with high-risk healthy watersheds for additional protective measures when appropriate. This also complements the Land Conservation Goal. Additional prioritization approaches may consider vulnerability, ecological, and other factors.

  Additional Protections – the most current information on protections (in addition to land protection) that are in place to assure long-term sustainability of watershed health including programs and policies related to:

  a. *Local Leadership* – strengthen local commitment and capacity to protect their healthy watersheds
  b. *Federal leadership* – increase communication within the federal agency partners, so that federal programs and agency decision-making are more protective of state-identified healthy watersheds

c. *Support state-based efforts* – encourage and recognize important activities within states

- **Assessment Information** – To the extent resources allow, states will work with the goal team to maintain and expand their assessment activities where possible to ensure that conditions in healthy watersheds are characterized and relevant data is integrated into a new tracking framework. Assessment information may include data collected for state Integrated Reports, reference reach studies, and other sources. Streams that are in the 'middle' – or marginally healthy – are at potential risk of being overlooked as there are no programmatic or regulatory drivers to target actions that prevent further degradation, nor restoration. The Goal Team will work collaboratively with the Stream Health workgroup to develop a method to track the improvement/degradation of marginal streams.

Management Approach #2: Local Leadership: Strengthen local commitment and capacity to protect their healthy watersheds

Increasing the number of communities striving to protect healthy watersheds and improving the effectiveness and success of their efforts are essential to achieving the Healthy Watersheds Outcome. A necessary task to achieve this goal is to effectively convey information on the status of healthy watersheds across the Chesapeake Bay region and to identify the various tools that may be used, primarily by local governments, to protect these watersheds. It is also important to communicate important information about Healthy Watersheds and the tools to maintain them to entities that influence local land use and other decisions affecting healthy watershed, including planning district commissions, soil & water conservation districts, land trusts and watershed organizations. The goal team will support the Local Leadership Management Strategy to increase the knowledge and capacity of local officials.

Coordination with local jurisdictions in healthy watershed protection is vital to success. The Maintain Healthy Watersheds Goal Implementation Team recognizes the Local Government Advisory Committee as a key partner. It is also important to recognize the synergy between the Healthy Watersheds outcome and the Land Use Options Evaluation and Land Use Methods and Metrics Development outcomes. These partners are working to quantify and reduce the rate of conversion of natural lands to development and by doing so will require direct coordination with local stakeholders to get relevant data, information and tools into the hands of managers on the ground. By reducing the rate of conversion to development in healthy watersheds there is a better opportunity to sustain pristine areas, and in this way, our goals are complementary. In addition, it will be important to engage with activities such as the Chesapeake Watershed Forum and the land trust community as well as reaching out to non-governmental local actors (like small watershed organizations and land trusts). As noted previously, each partner supporting this strategy will have the flexibility to support activities that identify, assess, prioritize, and protect healthy watersheds in accordance with its internal policies and available resources.

Management Approach #3: Federal and State Leadership: Increase communication within the federal family, so that federal programs and agency decision-making are more protective of state-identified healthy watersheds

Although local land use decisions are the single most critical factor in the protection of healthy watersheds, federal agencies have many high-leverage opportunities to set the stage for how state and local decisions do (or do not) further the protection of healthy watersheds. These opportunities include

both the implementation and oversight of regulatory programs and decision-making processes for agencies like the Federal Energy and Regulatory Commission (FERC), U.S. Department of Transportation (DOT), and state departments of transportation, as well as the EPA and state environmental and natural resource agencies.

Under this management approach, leaders within the partnership will deliver a unified message about the importance of protecting state-identified healthy watersheds in the Bay region to key federal actors. We will develop and support champions for healthy watersheds within federal agencies, and encourage them to work within their programs to improve outcomes for state-identified healthy watersheds.

Management Approach #4: Support state-based efforts: Encourage and recognize important activities within states

The Healthy Watersheds Goal specifies "state-identified healthy waters and watersheds" as the target for our efforts. Therefore, state-led and state-based activities to identify, assess, and monitor healthy watersheds play critical role in achieving the Outcome. States have taken different approaches to define and identify healthy watersheds, and likewise have different plans to improve their assessment and monitoring over time. The partnership will encourage and support states in implementing and improving their assessment and monitoring programs. The goal team has provided a valued forum for mutual learning and exploration of scientific and management issues, and will continue to do so.

State leadership on federal regulatory programs, primarily the Clean Water Act (CWA) Section 303, anti-degradation, and also grant programs like the National Fish and Wildlife Foundation Chesapeake Stewardship Fund and CWA Section 319 program funds, have a unique and critical role to play in achieving the Healthy Watersheds Outcome. States may also take actions to protect healthy watersheds through the outright purchase of land or easements (e.g., using CWA Section 319 funds or local donations), negotiated preservation of critical riparian and adjacent areas, more stringent post-construction stormwater management controls, nutrient removal onsite wastewater treatment systems, better animal waste management facilities, enhanced permit requirements, stormwater impacts, or nonpoint sources of pollution. The goal team will continue to serve as a forum for mutual learning among partners, and to recognize the contributions that these state-based efforts make to addressing critical gaps and achieving the Healthy Watersheds Outcome.

Cross-Outcome Collaboration and Multiple Benefits

For most of the strategy actions listed above, interactions and coordination with other Goal Implementation Teams will play a key role in minimizing the effect of potential barriers to success. Potential areas for interaction, communication, cooperation, and coordination with other goal teams are listed below:

- Scientific and Technical Assessment and Reporting Team: Cooperation in developing approaches for identifying, assessing, and monitoring the condition of existing healthy watersheds.
- Sustainable Fisheries Goal Implementation Team: Assistance in identifying key factors in maintaining sustainable fisheries and natural ecosystem functions.
- Habitat Goal Implementation Team: Cooperation in listing and maintaining a network of land and water habitats that support priority species, water quality, recreational uses, and scenic values. In addition, the Goal Team is collaborating with the Stream Health Workgroup to develop a methodology to identify marginal streams where restoration activity in-stream and, or

in the watershed may improve stream functions and health and increase the overall number of healthy waters and watersheds. An effort will be made to link streams and various definitions for stream health (i.e., Chessie BIBI to individual state metrics related to watershed health).

- Water Quality Goal Implementation Team: Communication regarding efforts to identify, define, quantify, and incorporate conservation practices into the Chesapeake Bay Program decision support system.
- Stewardship Goal Implementation Team: Cooperation on efforts to promote individual stewardship, support environmental education, protected lands and assist citizens, communities and local governments in undertaking conservation initiatives in the Bay region. Similarly, the team supports the language outlined in the Protected Lands Management Strategy related to crediting conservation: "Land conservation is not credited towards reductions in the Bay jurisdictions' annual pollution reduction progress reporting. However, land conservation may be able to generate credits for use in compliance trades and/or as offsets for new loads. There may also be opportunities to quantify and incorporate conservation practices into the Chesapeake Bay Program decision support system and to explore how land use projections might be used to quantify future pollutant load reduction incentives for land conservation."
- Enhancing Partnering, Leadership and Management Goal Implementation Team, which is the goal team leading the Local Leadership Management Strategy.

VII. Monitoring Progress

Current monitoring programs

While existing programs assess water quality and sometimes biota and habitat in at least a portion of waters biannually, comprehensive monitoring programs that track the status of healthy watersheds are largely not well developed. States and other entities are typically engaged more with monitoring impaired waters than assessing healthy watersheds. Moreover, the implication of a broader terrestrial component (i.e., beyond adjacent riparian habitat areas) in monitoring healthy watersheds – rather than just water quality – may represent an expanded component for agencies with few resources.

On the positive side, land use, land cover, and other land-based information is becoming more readily available, and is being packaged in more user-friendly formats. States, federal agencies, and private sector entities are developing and deploying data collection, integration, and mapping programs that can aggregate large amounts of information useful for producing baseline and trend analysis products that would support healthy watersheds tracking efforts. Most of these efforts are occurring at the local and intra-state regional level at present, but the potential for expansion is significant.

New or proposed monitoring approaches

The Healthy Watersheds Goal Implementation Team plans to work with other goal teams to cooperatively explore new/proposed monitoring approaches. There is considerable overlap among several teams relative to aquatic and terrestrial characterization and trend analyses, and substantial efficiencies can be realized by working together. One possible development that may complement the efforts described in this strategy is the upcoming inclusion of healthy watershed protection in state Clean Water Act (CWA) Section 319 Nonpoint Source Management Programs. Some states (e.g., New York) have already identified partnerships with the U.S. Environmental Protection Agency's (EPA)

Healthy Watershed Initiative in their nonpoint source management program plans, and more are expected to do so in the future. As noted previously, most of the activities involving healthy watershed protection will occur at the state and local level, and states and local governments will likely require some level of assistance in ramping up existing programs to address whatever healthy watershed activities they undertake.

Monitoring needs

One of the ultimate goals of the Watershed Agreement is for jurisdictions to continually improve and increase the health of waters and habitats throughout the watershed. To achieve this goal, it is it is important to understand how stream health varies in response to anthropogenic and natural stressors. Such changes could potentially negate the Healthy Watersheds Goal Team work to sustain 100 percent of state-identified current healthy waters and watersheds. These changes also affect the work of the Stream Health Outcome and workgroup as increasing stressors are more likely to lead an increase in the number of stream impairments. Consequently, there is great value in the restoration and conservation work implemented by the Stream Health Workgroup as such work may remove stressors leading not only to an improvement in the health of impaired streams, but also in streams that are degrading, but not yet identified as impaired. Improving and increasing the health of all waters helps to protect and maintain state identified healthy waters and watersheds. Therefore, the stream monitoring needs of the Healthy Watersheds Goal Team are complementary to those of the Stream Health Workgroup, and there is a data gap that needs to be addressed to develop a method to track the improvement or degradation of streams as a result of increased or changing stressors.

VIII. Assessing Progress

The assessment of progress under the Healthy Watersheds Outcome will be coordinated with other activities to ensure efficiency and effectiveness in data collection, analysis, and reporting. The Healthy Waters and Watersheds Outcome is intricately linked to many of the other Watershed Agreement Outcomes and developing a methodology to track watershed protection status will rely on the development and results of other indicators including, but not limited to, data related to stream health, black duck, and oysters. There is also considerable overlap between sustaining healthy watersheds and the broader Land Conservation Goal: Conserve landscapes treasured by citizens in order to maintain water quality and habitat; sustain working forests, farms and maritime communities; and conserve lands of cultural, indigenous and community value. The goal team is working closely with land conservation partners to track land conservation in healthy watersheds. In addition, the goal team is actively coordinating with the two Land Use outcomes below:

Land Use Methods and Metrics Outcome

Continually improve the knowledge of land conversion and the associated impacts throughout the watershed. By 2016, develop a Chesapeake Bay watershed-wide methodology and local level metrics for characterizing the rate of farmland, forest and wetland conversion, measuring the extent and rate of change in impervious surface coverage and quantifying the potential impacts of land conversion to water quality, healthy watersheds and communities. Launch a public awareness campaign to share this information with citizens, local governments, elected officials and stakeholders.

Land Use Options Evaluation Outcome

By the end of 2017, with the direct involvement of local governments or their representatives, evaluate policy options, incentives and planning tools that could assist them in continually improving their capacity to reduce the rate of conversion of agricultural lands, forests and wetlands as well as the rate of changing landscapes from more natural lands that soak up pollutants to those that are paved over, hardscaped or otherwise impervious. Strategies should be developed for supporting local governments' and others' efforts in reducing these rates by 2025 and beyond.

States that include healthy watershed elements in their nonpoint source pollution management programs may elect to develop methods to assess progress as part of that effort. Others may wish to collaborate in developing a separate approach, in conjunction with other partnership groups. Regardless of the approach employed, biennial updates should include a discussion on whether adequate progress is being made and the strategy or actions that will be taken if progress is not sufficient. Evaluation factors to consider include completion of planned actions as scheduled (i.e., under the biennial workplans), and the sufficiency and timeliness of the outcomes.

IX. Adaptively Manage

The Healthy Watersheds Goal Implementation Team will meet semiannually to review activities and discuss accomplishments, challenges, and possible solutions. The team will work with states and their partners to help them adapt to barriers to activities conducted under the biennial workplans. Biennial reevaluations will assess progress toward completing actions in the workplans and identify if changes will be needed for the next biennial cycle. Stakeholder input will be incorporated into the development and reevaluation of each strategy action.

X. Biennial Workplan

Biennial workplans for each management strategy were developed for the 2016-2017 and the 2018-2019 timelines, respectively. The Healthy Watersheds Workplan includes the following information:

- Factors influencing the ability to achieve the outcome
- Current efforts for addressing those factors
- Gaps or further efforts or needs to fully address factors
- Actions essential to achieve the outcome (with description, performance target(s), responsible parties, location and timeline included as appropriate)