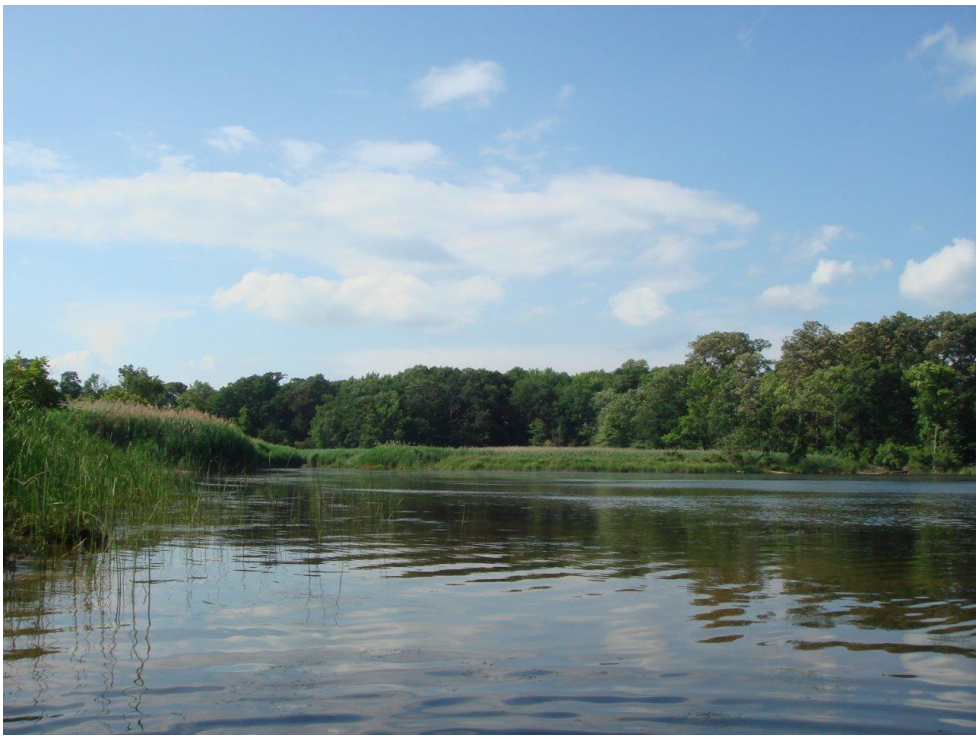
Healthy Watersheds Outcome

Management Strategy



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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 Bay by delivering clean water and critical habitat today while we seek to restore areas that have been degraded. Healthy watersheds also provide numerous social and economic benefits to local communities throughout the Bay watershed; 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 partnership, focus in 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.

I. 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 (i.e., through establishment and implementation of Chesapeake Bay Total Maximum Daily Load (TMDL)'s). 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 Watershed Goal Implementation team (Team) made the strategic decision to not seek a common definition for the healthy waters and watersheds addressed in this Outcome. Each jurisdiction has individual programs and responsibilities for protection. Honoring state's preferences, the Team chose to move forward 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 on our website. A summary of individual State definitions can also be reviewed in section V. Note: Updated information will be maintained on these sites, as refined by our partners.

It should be noted that watershed health across the Bay region currently ranges from impaired (i.e., not meeting numeric/narrative criteria which 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.

II. Participating Partners

As noted above, each entity 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 overall healthy watersheds protection goal. All partnering entities 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
- U.S. Environmental Protection Agency
- National Oceanic and Atmospheric Administration (NOAA)
- U.S. Army Corps of Engineers (USACE)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Geological Survey (USGS)
- U.S. Forest Service (USFS)
- 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 act promptly 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 transportation, economic development, and other planning activities; zoning rules; land and easement purchases; post-construction stormwater management and mitigation requirements; and a variety of other tools.

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. In addition it will be important to engage with the groups and organizations such as those who attend the Chesapeake Watershed Forum and the Land Trust Alliance Rally, as well as reaching out to non-governmental local actors including small watershed organizations and land trusts. As noted previously, each partner supporting the 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.

III. Factors Influencing Success

Human and natural factors

A wide range of natural and human factors influence attainment of the healthy watershed 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 flow regimes and channel stability is often linked to human induced land use changes in the watershed.

Among the direct human factors, increasing urban, energy, and transportation infrastructure development are the most significant influences on watershed health through changing land use and other habitat modifications. In terms of the partnership's ability to identify, characterize, and protect healthy watersheds, management and programmatic factors loom large. 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: 1) knowledge about the status of healthy waters/watersheds, and 2) cumulative action, with a focus on local engagement. Each is addressed below.

Information about the status of healthy waters/watersheds is a key factor
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 interventions at sustaining healthy watersheds (are our investments working?)

Cumulative action, with a focus on local engagement, is a key factor
Achievement of this outcome will not happen through any one mechanism or stakeholder. Rather, multiple actions are needed from a diversity of stakeholders to ensure healthy watershed protection. Actions can include an array of regulatory and non-regulatory tools, 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 Bay region, these actions often occur in isolation.

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. While state and federal actors can greatly affect the protection of a healthy watershed, local governments and organizations are many time the key factor in their protection because of their role in local land use decisions. Integrating action from across these stakeholders will be essential to achieve this goal, including development of the 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.

IV. Current Efforts and Gaps

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

Gaps in the current approach exist, however. 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, new roadway, timber harvest, and so on. 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 subsections address current efforts and gaps regarding healthy watershed identification and protection activities.

Collection of comprehensive healthy watershed status and/or condition information.
Managers cannot be expected to know the status and importance of various watersheds – or what types of protective measures are needed – when comprehensive assessment information is unavailable. Most states with high quality, exceptional, outstanding, or otherwise healthy watersheds have at least some assessment information, such as physical or chemical monitoring data, in-stream biota (e.g., macroinvertebrates, fish), benthic and riparian habitat conditions – including bank stability, and other data. Some states and federal agencies are using 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 identifying targeted ecological areas and fragmentation / development of natural and working lands via the GreenPrint tool. 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 collection and use of watershed condition information has been used to characterize impaired watersheds for restoration, rather than to identify and protect healthy watersheds. In other words, there is a lack of information for assessing "health" as opposed to "degradation". Further, routine collection of information about the status of healthy waters and watersheds is often lacking.

Characterization of existing protective measures for state-identified healthy watersheds
Healthy watersheds are protected by a patchwork of anti-degradation, discharge permitting, land conservation, easement purchase, and other measures. For example, state Clean Water Act Section 319 management plans are beginning to include healthy watershed protection elements. 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. For example, a subwatershed owned by a stable land trust or conservancy might be considered better protected than an area set aside informally by a commercial partnership as a nature preserve. 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.

Assessments of healthy watershed vulnerability

Healthy watersheds are affected by residential, commercial, transportation, and other construction activities; energy resource development; water withdrawals; dams and other barriers; and upstream influences of wastewater discharges, agriculture, and other nonpoint sources 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 US Geological Survey (USGS) and other 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 US 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 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.

> **Gap:** Widespread assessments of health 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.

Prioritization approaches for healthy watershed protection efforts

With a database of healthy watersheds and information on their current condition, existing protections, and information on relative vulnerability, managers can 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.

Identification and application of protective measures for healthy watershed facing high-level near-term risks

Watersheds that are high quality, exceptional, outstanding, or otherwise healthy which 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 local conservancy 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, or upstream projects that address wastewater discharges, stormwater impacts, or nonpoint pollution.

> **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, instream 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 underscored the need to coordinate with the Land Use Options Evaluation Outcome.

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

> **Gap:** Usage of existing tools is not universal – even within states; and some tools are underdeveloped, poorly supported, and unsuited for widespread sharing and/or integration. The 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.

Engagement and involvement of local communities in healthy watershed protection activities
Local communities often play an outsized role in identifying and protecting highly valued waterways and watersheds. Lakes, rivers, streams, wetlands, estuaries, and coastal waters are often the nexus for recreation, tourism, aesthetics, and, of course, water supply for homes, industry, and businesses. A variety of local stakeholders are often vitally interested in watershed management issues. City planning, zoning, and public works professionals typically have an interest in economic development, water quality, flooding, stormwater management, source water protection, recreation, and urban aesthetics. Conservationists may promote designation or expansion of natural areas, greenways, green infrastructure, forest land, fisheries, and other local assets. Real estate personnel and property owners often share all of these concerns, along with the desire to see local property valued, protected, and enhanced. The benefits of healthy waters and watersheds have been widely documented, and the value of residential property near nature preserves, natural waterbodies, greenways, parks, and forests is well known in the real estate industry.

> **Gap:** There is often a disconnect between local proponents and supporters of healthy waters and the public and private sector tools that can establish and sustain watershed protective

measures. When it occurs, local engagement is likely to be unique, case-specific, and highly dependent on the organizations and issues involved. Outreach, awareness building, and education will be needed to inform local communities regarding the resources and tools available, and how they might be applied locally. Outreach efforts will need to focus on 1) the importance and value of local waters, not necessarily the Bay, and 2) a powerful, consistent message that resonates locally – such as drinking water protection, natural resource stewardship, recreation, and other relevant values.

Addressing federal and state management and permitting agencies

Both state and federal agencies have planning functions and review authorities over actions on the ground which alters land use. Two prominent examples of such actions are energy-related infrastructure such as pipelines, compressor stations, and transmission lines, and , transportation infrastructure. Cumulatively these actions have a significant influence on the health of watersheds across the Chesapeake Bay watershed. Protection of healthy watersheds is a recognized priority of certain state or federal programs, but it can be a challenge to insert healthy watersheds considerations into decision-making of energy and transportation agencies.

Gap: Agencies or programs that generate information about the location, status, and trends of healthy watersheds do not always effectively deliver this information to other agencies or programs whose management or decision-making impacts healthy watersheds. Champions for healthy watersheds do not have unified voice to convey to their colleagues in state and federal agencies the importance for protecting healthy watersheds.

V. Management Approaches

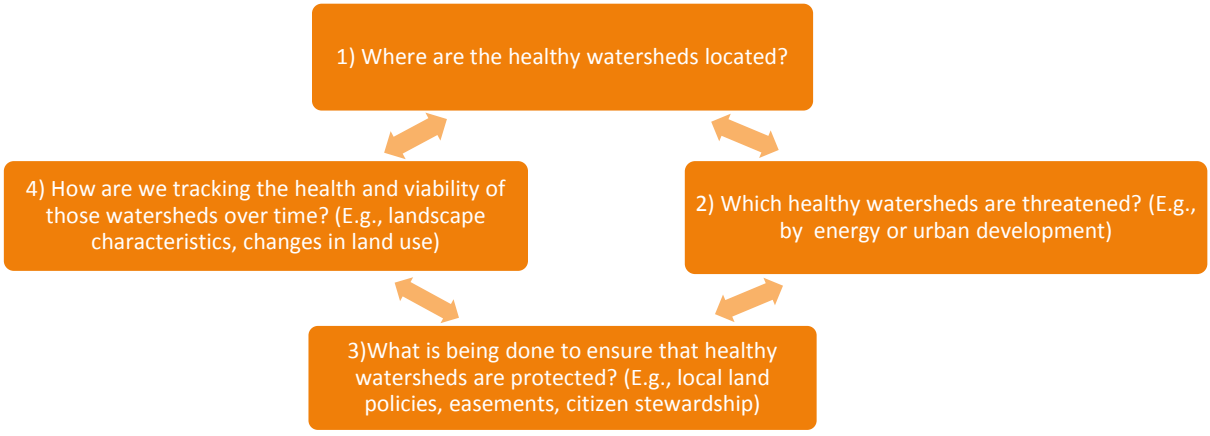
The Healthy Watersheds Outcome can only be achieved through the cumulative impact of a wide variety of actions undertaken by a multitude of actors at many scales. Recognizing this, our management approach is to focus on four key areas where the Partnership's investments can make the highest contribution: 1) tracking the health of watersheds and our effectiveness in protecting them, 2) strengthening local commitment and capacity to protect healthy watersheds, 3) improving 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.

These actions address high priority factors and gaps, *and* take advantage of the unique strengths of the Goal Team Partnership – cross management strategy coordination, aligning 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 complimented by actions that states may undertake unilaterally, such as improving assessment and monitoring of healthy watersheds, strengthening implementation of anti-degradation and other regulatory programs, and better targeting land protection programs. The Goal Team Partnership provides a valuable forum for mutual learning and exploration of scientific and management issues that can support state efforts in these areas.

The 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 Team has formed a Tracking Workgroup of State, Federal and NGO's 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 waters 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 assure 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 the 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.

- **Assessment Information** – To the extent resources allow, States will work with the Team to maintain and expand their assessment activities where possible to ensure that conditions in healthy watersheds in the Bay region 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.

- **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, and other factors.

- **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.

For reference, Jurisdictions' healthy waters and watersheds definitions are provided here:

- **Delaware:** no healthy waters or watersheds identified
- **District of Columbia:** no healthy waters or watersheds identified
- **Maryland:** Anti-degradation Tier II Catchments will be used for MD'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 were 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, were 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" which represents "segments where monitoring data and information indicate that there are no use restrictions or other water quality impacts/issues" is being used for New York's healthy waters and watersheds.
- **Pennsylvania:** designated or existing uses classified as Exceptional Value or High Quality were used as the basis for identifying Healthy Watersheds.
  - High Quality Water
    - Chemistry meets water quality criteria at least 99% 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%)
      2) Class A wild trout stream

  - Exceptional Value Water - Meets requirements of High Quality and…
    - Is located in a National Wildlife Refuge
    - Is located in a designated Stake 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% 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 VA'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 (4th 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:** WV does not have a state defined "healthy watersheds" program or definition. WV's anti-degradation rule can be applied to help define this category of streams. WV'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	John Schneider (DNREC)
Maryland	Helen Stewart (MDNR)
New York	Ben Sears (NYDEC)
Pennsylvania	Diane Wilson (PADEP)
Virginia	Todd Janeski (VDCR), Greg Garman (VCU)
West Virginia	Tim Craddock (WVDEP)

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. The right ingredients for this change exist in communities of all sorts across the Bay Watershed – but the task of educating and mobilizing communities at a great enough scale to achieve the Healthy Watersheds Outcomes seems almost impossible. Local leadership is the key to unlocking local potential and harnessing the power and creativity of local actors to protect healthy watersheds.

The Team will support the Local Leadership Management strategy to increase knowledge and capacity of local officials. It is important to recognize "unofficial" local leaders for championing healthy watersheds. Other local leaders include watershed organizations and local or regional land trusts. This Team will seek to collaborate with others to support and engage these groups to ensure that they have the knowledge and skills they need to succeed, as well as the information needed to effectively protect healthy watersheds.

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 for 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 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) and US Department of Transportation (US DOT) and State DOTs, as well as US 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 Chesapeake Bay watershed 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, so state-led and state-based activities to identify, assess, and monitor healthy watersheds play an important role in achieving the Outcome. Different states have taken different approaches to defining and identifying healthy watersheds, and likewise have different plans to improve assessment and monitoring over time. The Partnership will encourage and support states in implementing and improving their assessment and monitoring programs. The Maintain Healthy Watersheds Goal Implementation 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, but also grant programs such as the National Fish and Wildlife Foundation, 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 such as 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, or upstream projects that address wastewater discharges, stormwater impacts, or nonpoint sources of pollution. The 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 Chesapeake Bay 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 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
- 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, and assist citizens, communities and local governments in undertaking conservation initiatives in the Bay region.
- Local Government Advisory Committee: support them in developing training capacity to increase local knowledge and skills; provide content relevant to Healthy Watersheds Goal

VI. Monitoring Progress

Current monitoring programs

While there are existing programs to assess water quality and sometimes biota and habitat in at least a portion of waters biannually, comprehensive monitoring program that track the status of healthy watersheds are undeveloped at best. States and other entities have been 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 be useful in healthy watersheds tracking efforts (see figure 2 above). 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 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 CWA Section 319 Nonpoint Source Management Programs. Some states (e.g., New York) have already identified partnerships with US EPA's 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 locals 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 the jurisdictions to continually improve and increase the healthy waters and habitats throughout the watershed. Streams are on a spectrum of health from those that are deemed impaired to those that the states have identified as being outstanding and healthy. The Stream Health outcome focuses on improving the impaired streams while the Healthy Watersheds team works to sustain 100 percent of state-identified current healthy waters and watersheds. The complementary efforts of the two teams focus on improving the health of streams and protecting the streams that the states identify as outstanding and healthy. There is a gap on how to address the streams that are neither impaired nor state-identified as healthy. The function and health of these marginal streams have the potential to be improved to the level needed to be identified as a healthy watershed by the states. In the meantime, actions need to be taken to prevent these marginal streams from further degradation. Streams have degraded over time and further research is needed to understand and predict how the streams will react to anthropogenic and natural pressures. There is a data gap that needs to be addressed in order to develop a method to track the improvement/degradation of marginal streams.

VII. 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 Bay Agreement Outcomes and developing a methodology to track the protection status will rely on the development and results of other indicators including, but not limited to, data related to protected lands, stream health, black duck, oyster as well as other Outcomes. In addition, The Team is actively coordinating 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.

VIII. 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 regarding 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.

IX. Biennial Workplan

Biennial workplans for each management strategy will be developed by December 2015. It will include the following information:

- Each key action
- Timeline for the action
- Expected outcome
- Partners responsible for each action
- Estimated resources