



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

Chesapeake Bay Program Office



The Watershed Agreement + The Phase 3 WIP...

Tools for Telling a Story



Objectives – Summarize Work of Action Team

- Work Products Requested
 - Definition of Outcomes that Overlap with the WIP
 - Development of Messaging Tools
 - Templates
 - Powerpoint Presentation
 - Development of Standard Language for Incorporation into Phase 3 WIPs
- What Next?
 - ASK of the Management Board:
 - Commitment to move forward with the products developed to use these in each jurisdiction's WIPs, as appropriate.
 - Include reference to the products developed in the EPA Expectations Document
 - Future Incorporation and Cross-Referencing between the WIP and the Outcomes

Bay Program “Stacking” Efforts

- Brook Trout
- Climate Resiliency
- Fish Habitat
- Forest Buffers
- Healthy Watersheds
- Protected Lands
- Public Access
- Stream Health
- Submerged Aquatic Vegetation
- Toxic Contaminants
- Tree Canopy
- Wetlands

Templates

Forest Buffers:

Principles for Phase III Watershed Implementation Plans

Planting buffers for human health, economic development, and infrastructure

Restoring riparian forest buffers is tantamount to a healthy watershed. Buffers are a cost-effective, common-sense water quality practice—every dollar spent on this practice reduces the need for more costly urban practices and less effective agricultural practices. Funding is available to restore riparian forest buffers. Through the federal-state Conservation Reserve Program, almost all costs for this practice can be met. Each year, there is more funding than is used in this program.

Buffers are effective at cleaning water—they reduce bacteria, other microorganisms, micro plastic fibers, harmful algal blooms, and an unknown number of emerging contaminants that are easily found in surface waters. Buffers also keep stream temperatures down which can reduce the occurrence of algal blooms and bacteria, making the water in our streams more swimmable and drinkable. Cows also benefit directly-- herd health improved once cows are fenced out of the stream, allowing a buffer to establish.

Buffers help municipalities by treating stormwater and dissipating flood energy and erosion potential of streams, rivers, and tides. Floodplain buffers are particularly important for treating flood water. Buffers improve recreational services such as fishing, boating, swimming, hiking, biking, and wildlife viewing. Quality-of-life is perceived higher around trees. Streams and buffer restoration offer a great opportunity for economic revitalization.

Best Management Practices with Forest Buffers in Mind

Of the many best management practices (BMPs) used to improve quality of Chesapeake Bay waterways, the restoration of forest buffers might be the best. Forest buffers provide critical barriers between polluting landscapes and receiving waterways, reducing the adverse effect of excessive nitrogen, phosphorus, and suspended sediment inputs using relatively little land. In addition to their well-recognized role in improving water quality, riparian forests fulfill important habitat needs for a host of aquatic and terrestrial species. See the table below for forest buffer BMPs with other co-benefits*

Best Management Practice	Forest Buffers	Additional Co-Benefits					
		Habitat Biodiversity	Brook Trout	Stream Health	Fish Habitat	Healthy Watersheds	Tree Canopy
Agricultural Forest Buffer	5	4	4.5	4	4.5	4	4.5
Forest Conservation	3.5	5	4	4	4	5	5
Forest Harvesting Practices	3.5	2	2	4	3	3	2
Narrow Forest Buffer	5	2.5	3.5	2	3.5	2	5
Streamside Forest Buffers	5	4	4.5	3	4.5	3	5
Urban Forest Buffers	5	5	5	4	4	3.5	4.5

*Values were taken from the [Quantification of BMP Impact on the Chesapeake Bay Program Management Strategies](#) study by Tetra Tech. [Appendix E](#) Final Impact Scores evaluates BMP effects on outcomes on a scale of +5 (very beneficial) to -5 (very harmful). This table shows BMPs that scored a 3.5 or higher and -3.5 or lower for the Forest Buffer Outcome.

-5 -4.5 -4 -3.5 -3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

Guiding Principles for Incorporating Outcome

WIP Development

- Calculate benefit of establishing buffers by using CAST.
- Identify areas where more buffers are needed.
- Staff-up for establishing buffers on agricultural and developed land.
- Insist on buffering all streams on conserved agricultural land.
- Improve internal and external education around the importance of buffers.

WIP Implementation

- Engage over buffer restoration at every opportunity: whenever there is landowner contact- whether for a different restoration practice or conservation easements.
- Educate landowners and increase incentives to them for establishing a buffer.

Tools and Resources

- [A Guide for Forestry Practices for Phase III WIPs](#)
Packet of information on all forestry practices
- [Healthy Watersheds Forestry TMDL Forest Retention Study](#)
(http://www.chesapeakebay.net/channel_files/25322/healthy_waters_forest_retention_-_final_report.pdf)
This report includes a toolbox of recommendations and incentives for stimulating forestland retention
- [Chesapeake Riparian Forest Buffer Network](#) (<http://chesapeakeforestbuffers.net/>)
Website with information, resources, and success stories related to riparian forest buffers
- More can be found on the Forestry Workgroup page
https://www.chesapeakebay.net/who/group/forestry_workgroup

Contacts for More Information on Forest Buffers in your Jurisdiction

Jurisdiction	Website	Lead	Email
Delaware	Delaware Forest Service	Marcia Fox	marcia.fox@state.de.us
D.C.	DOEE – Trees in the District	Luke Cole	luke.cole@dc.gov
Maryland	MD Forest Service Buffer Initiative	Anne Hairston-Strang	astrang@dnr.state.md.us
New York	NYDEC Riparian Buffers	Lauren Townley	lauren.townley@dec.ny.gov
Pennsylvania	PA DCNR Riparian Buffers	Matt Keefer	makeefer@pa.gov
Virginia	VA DOF Riparian Forest Buffers	Greg Evans	gregory.evans@dof.virginia.gov
West Virginia	WV Chesapeake Bay Forestry	Herb Peddicord	herb.f.peddicord@wv.gov
CBP Contact	CBP Forestry Workgroup	Sally Claggett	sclaggett@fs.fed.us

Powerpoint for Outreach

- Tool to explain connection between outcomes and the Phase 3 WIP
- Audience would be those identified as part of local engagement strategies
- Facilitate additional thinking at the local level as to how participation in the Phase 3 WIP process can help local decision makers achieve their own goals and priorities



Phase III Watershed Implementation Plans

Including programmatic outcomes in your planning to provide co-benefits for your community and reduce pollution

Name/Title/Organization

****INSERT DATE HERE****



Why are we here today?

- To explain why building certain conservation practices into your Phase III Watershed Implementation Plans (WIPs) can benefit:
 - you and your community by providing economic and public health benefits,
 - your state by helping to meet their goals for reducing nutrient pollution,
 - and your local waterways by helping with their restoration and protection.



Chesapeake Bay watershed

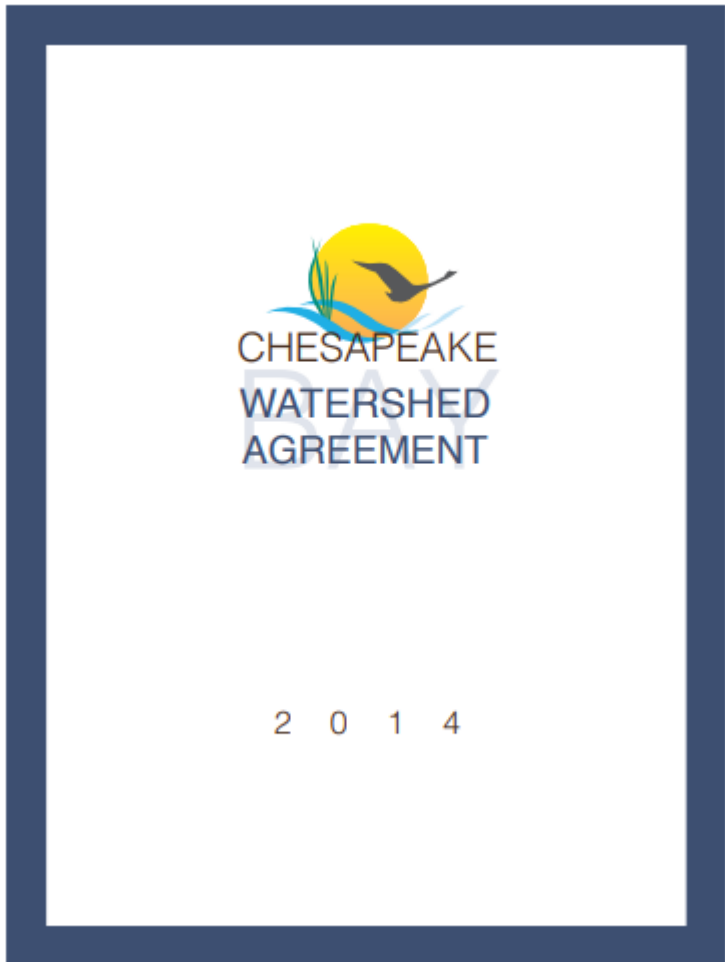


What are the Phase III WIPs?

- Detailed, specific steps to address nutrient and sediment pollution.
- Required to meet the pollution reduction goals set in the Chesapeake Bay Total Maximum Daily Load, or Bay TMDL.
- Your conservation practices can be credited to help your state meet their pollution goals.
- Beneficial for keeping your local waterways healthy.



Chesapeake Bay Watershed Agreement



- Signed in 2014 by the six watershed states, the District of Columbia, the Environmental Protection Agency and the Chesapeake Bay Commission.
- Contains 10 goals and 31 outcomes to advance the restoration and protection of the Bay watershed.



Why are co-benefits important?

- Implementing certain conservation practices can help meet your state's pollution reduction goals but also can....



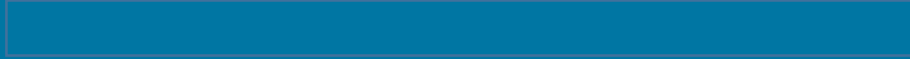
Help meet the goals of the *Watershed Agreement*



Provide economic benefits to and your community



Improve the health and welfare of your friends and family



How can these outcomes provide co-benefits?

- Co-benefit graphic.



A Rural Story – Mercer Vu Farms



Conservation practices implemented: no-till farming, cover crops and riparian buffers.



Benefits: cost savings, innovative uses of by-products, reduction in air pollution and minimal climate impacts.



Outcomes met: climate resiliency, forest buffers, stream health



A Suburban Story – READY Program



Conservation practices implemented: rain gardens, forest buffers, rain barrels, impervious surface treatment



Benefits: job creation, environmental education, reduced stormwater loads



Outcomes met: forest buffers, tree canopy, diversity, environmental literacy



An Urban Story – Greening Virginia's Capital



Conservation practices implemented: green alleys, permeable pavers, rain gardens



Benefits: nitrogen and phosphorus reductions, abated stormwater runoff, recreation



Outcomes met: toxic contaminants, healthy watersheds, climate resiliency, fish habitat



Chesapeake Bay Program



Forest Buffers:

Principles for Phase III Watershed Implementation Plans

Name of outcome.

Planting Buffers for Human Health, Economic Development, and Infrastructure

Restoring riparian forest buffers are tantamount to healthy watersheds due to their effectiveness at cleaning water. Buffers reduce bacteria, microorganisms, microplastic fibers, harmful algal blooms, and many emerging contaminants that are found in surface waters. They also keep stream temperatures down, which can reduce the occurrence of algal blooms and bacteria, making the water in our streams more swimmable and drinkable. Herd health also directly improves once cows are fenced out of a stream and a forest buffer is established.

Riparian forest buffers are also a cost-effective water quality practice. Every dollar spent on forest buffers reduces the need for costlier urban practices and less effective agricultural practices. Funding is available to restore riparian forest buffers. Through the federal and state [Conservation Reserve Program](#) almost all costs for this practice can be met.

Stream and buffer restoration offers great opportunities for economic revitalization. Buffers help municipalities by treating stormwater, dissipating flood energy, and reducing erosion potential of streams, rivers, and tides. Floodplain buffers are particularly important for treating flood water. Buffers also improve recreational services such as fishing, boating, swimming, hiking, biking, and wildlife viewing. In addition, quality of life is perceived higher around trees.

Short summary about the outcome and its co-benefits.

Best Management Practices (BMPs) with Forest Buffers in Mind

Many believe that forest buffers are the best BMP especially when considering their multiple co-benefits and cost-effectiveness. All growing forests contribute to clean water, but forest buffers provide critical barriers between polluting landscapes and receiving waterways, reducing the adverse effect of excessive pollutants (including nitrogen, phosphorus, and suspended sediment) while occupying relatively little land. In addition to their well-recognized role in improving water quality, riparian forests fulfill important habitat needs for a host of aquatic and terrestrial species. See the table below for forest buffer BMPs with other co-benefits.*

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		Habitat Biodiversity	Brook Trout	Stream Health	Fish Habitat	Healthy Watersheds	Tree Canopy
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Forest Conservation	3.5	5	4	4	4	5	5
Forest Harvesting Practices	3.5	2	2	4	3	3	2
Narrow Forest Buffer	5	2.5	3.5	2	3.5	2	5
Streamside Forest Buffers	5	4	4.5	3	4.5	3	5
Urban Forest Buffers	5	5	5	4	4	3.5	4.5

Table showing best management practices with co-benefits in mind. The table shows the effects of best management practices on outcomes on a scale from +5 (very beneficial) to -5 (very harmful).

*Values were taken from the [Quantification of BMP Impact on the Chesapeake Bay Program Management Strategies](#) study by Tetra Tech. Appendix E Final Impact Scores evaluates BMP effects on outcomes on a scale of +5 (very beneficial) to -5 (very harmful). This table shows BMPs that scored a 3.5 or higher and -3.5 or lower for the Forest Buffer Outcome.

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Guiding Principles for Incorporating Outcome

WIP Development

- Calculate benefit of establishing buffers by using the Chesapeake Assessment Scenario Tool (CAST)
- Identify areas where more buffers are needed
- Increase resources for establishing buffers on agricultural and developed land
- Insist on buffering all streams on conserved agricultural land
- Improve internal and external education around the importance of buffers

WIP Implementation

- Use every opportunity to engage with landowner about buffer restoration efforts, including when contacting for a different restoration practices or conservation easements
- Educate landowners and increase incentives to establish a buffer

Guiding principles for incorporating outcome (WIP development and implementation).

Tools and Resources

- [A Guide for Forestry Practices for Phase III WIPs](#)
Packet of information on all forestry practices
- [Healthy Watersheds Forestry: IMDL Forest Retention Study](#)
This report includes a toolbox of recommendations and incentives for stimulating forestland retention
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Website with information, resources, and success stories related to riparian forest buffers
- Additional information can be found on the [Forestry Workgroup page](#)

Additional tools and resources.

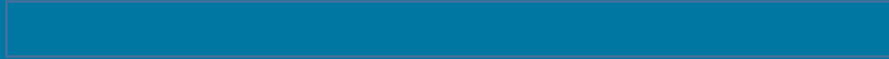
Contacts for More Information on Forest Buffers

Jurisdiction	Website	Lead	Email
Delaware	Delaware Forest Service	Marcia Fox	marcia.fox@state.de.us
D.C.	DOEE – Trees in the District	Luke Cole	luke.cole@dc.gov
Maryland	MD Forest Service Buffer Initiative	Anne Heirston-Strang	Anne.Heirston-Strang@maryland.gov
New York	NYDEC Riparian Buffers	Lauren Townley	lauren.townley@dec.ny.gov
Pennsylvania	PA DCR Riparian Buffers	Matt Keefer	makeefer@pa.gov
Virginia	VA DOF Riparian Forest Buffers	Todd Groh	todd.groh@dof.virginia.gov
West Virginia	WV Chesapeake Bay Forestry	Herb Peddicord	herb.f.peddicord@wv.gov
CBP Contact	CBP Forestry Workgroup	Sally Claggett	sclaggett@fs.fed.us

Points of contact.

Brook Trout





Outcome: Restore and sustain naturally reproducing brook trout populations in Chesapeake headwater streams with an eight percent increase in occupied habitat by 2025.

Progress: A formal indicator of progress for brook trout is under development.

Implementing these conservation practices:

- Agricultural forest buffers
- Streamside forest buffers

Will also benefit these outcomes!

- Habitat and biodiversity
- Stream health
- Fish habitat
- Healthy watersheds
- Forest buffer
- Tree canopy



What should I know about brook trout?

- Water quality is imperative to sustaining a healthy brook trout habitat. They thrive in clean, cool streams (under 68 degrees Fahrenheit). Plant agriculture and streamside buffers conserve nearby forests to reduce temperature and sediment inputs.
- Brook trout are highly prized by recreational anglers who spend millions of dollars annually on related goods and services, including travel, that would directly benefit local and state economies.



Climate Resiliency



Goal: Increase the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions.

Progress: A formal indicator of progress for climate adaption and climate monitoring and assessment is under development.

Implementing these conservation practices:

- Urban Forest Buffers
- Forest Conservation

Will also benefit these outcomes!

- Climate adaption
- Energy efficiency
- Flood risk mitigation

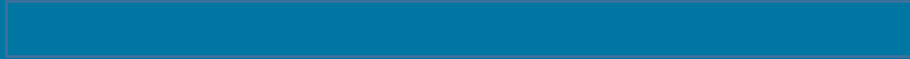


What should I know about climate resiliency?

- Addressing climate impacts in conjunction with ongoing restoration efforts will prepare your community for greater variability and can help achieve cost savings and reduce risks.
- Considering future impacts during the planning, siting, design and implementation of conservation practices can help to reduce the vulnerability of a project to fail.
- Assessing climate impacts at the initial stage of watershed implementation planning will increase effectiveness, decrease maintenance costs and contribute toward meeting pollution reduction goals.



Fish Habitat



Outcome: Continually improve effectiveness of fish habitat conservation and restoration efforts by identifying and characterizing critical spawning, nursery and forage areas within the Bay and tributaries for important fish and shellfish, and use existing and new tools to integrate information and conduct assessments to inform restoration and conservation efforts.

Progress: A formal indicator of progress for fish habitat is under development.

Implementing these conservation practices:

- Agricultural forest buffer.
- Streamside forest buffer.
- Urban stream restoration.

Will also benefit these outcomes!

- Protected lands.
- Habitat biodiversity.
- Brook trout.
- Blue crab.
- Recreation.
- Forage fish.
- Wetlands.



What do I need to know about fish habitat?

- Fish are important to ecosystem function and provide economic and social benefits.
- Local land use decisions impact the production and sustainability of fish resources.
- If designed effectively, infrastructure projects and conservation practices can improve fish habitat, create resiliency to projected climate change impacts and decrease erosion.

Forest Buffers





Outcome: Continually increase the capacity of forest buffers to provide water quality and habitat benefits throughout the watershed. Restore 900 miles per year of riparian forest buffer and conserve existing buffers until at least 70 percent of riparian areas throughout the watershed are forested.

Progress: As of 2015, seven percent of the annual target achieved.

Implementing these conservation practices:

- Agricultural forest buffer.
- Forest conservation.
- Urban forest buffers.

Will also benefit these outcomes!

- Habitat biodiversity.
- Brook trout.
- Stream health.
- Fish habitat.
- Healthy watersheds.
- Tree canopy.



What do I need to know about forest buffer?

- Riparian forest buffers reduce bacteria, microorganisms, microplastic fibers, harmful algal blooms, and many emerging contaminants that are found in surface waters, including drinking water.
- Riparian forest buffers keep streams cool for fish and wildlife.
- Buffers help municipalities by treating stormwater, dissipating flood energy, and reducing erosion potential of streams, rivers, and tides. Buffers also improve recreation like fishing, boating, swimming, hiking, biking, and wildlife viewing.

Healthy Watersheds





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

Progress: Each of the six watershed states and the District of Columbia have different definitions of healthy waters and watersheds in which they use to track and support protection.

Implementing these conservation practices:

- Agricultural forest buffers.
- Forest conservation.
- Urban forest buffers.
- Urban growth reduction.
- Urban stream restoration.

Will also benefit these outcomes!

- Protected lands.
- Biodiversity habitat.
- Brook trout.
- Stream health.
- Fish habitat.
- Forage fish.
- Flood mitigation.
- Recreation.

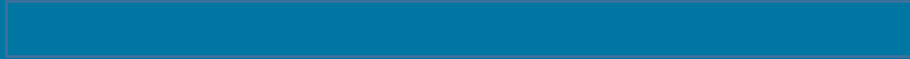


What should I know about healthy watersheds?

- It's important to know where the healthy watersheds in your community and state are located.
- Designing conservation practices to reduce vulnerability to healthy waters can lessen land use change, offset future urban growth, increase land protection and reduce water demand and withdrawals.
- Conservation practices that protect healthy watersheds provide several co-benefits.

Protected Lands





Outcome: By 2025, protect an additional two million acres of lands throughout the watershed – currently identified as high conservation priorities at the federal, state or local level – including 225,000 acres of wetlands and 695,000 acres of forest land of highest value for maintaining water quality.

Progress: As of 2015 – 2016, fifty percent of the outcome had been achieved.

Implementing these conservation practices:

- Agricultural forest buffers.
- Forest conservation.
- Urban forest buffers.

Also benefit these outcomes!

- Biodiversity and habitat.
- Wetlands.
- Healthy watersheds.
- Land use metrics and methods.
- Fish habitat.
- Climate adaption.
- Forest buffers.
- Recreation.



What should I know about protected lands?

- Preserving lands increase the economic benefits generated by the outdoor recreation industry and improves human health and well-being through regularity of spending time in nature.
- Local economies are buoyed by tourism to preserve historic, cultural and heritage sites and landscapes.
- The Chesapeake Bay Program is perfecting for the first time a set of new “Conservation Plus Best Management Practices” with estimated pollution load reductions for the retention of high quality forests, agricultural lands, and growth management. These new conservation practices will be available for localities projected to experience future growth and development to consider in preparing their Phase III WIPs.

Public Access





Outcome: By 2025, add 300 new public access sites, with a strong emphasis on providing opportunities for boating, swimming and fishing, where feasible.

Progress: As of 2016, 44 percent of the outcome has been achieved.

Implementing these conservation practices:

- Agricultural forest buffer.
- Forest conservation.
- Urban stream restoration.

Also benefit these outcomes!

- Biodiversity habitat.
- Brook trout.
- Stream health.
- Healthy watersheds.
- Fish habitat.
- Forage fish.



What do I need to know about public access?

- Providing public access is a significant contributor to the economy of the Bay watershed. According to the 2006 study *The Active Outdoor Recreation Economy*, paddle-based recreation and fishing alone have a total national economic value of \$97.5 billion.
- Open, green spaces and waterways with ample public access bolster public health and quality of life. Outdoor time strengthens family bonds and nurtures creative children, while building personal connections with the very places that have shaped life in the region for centuries—especially its streams, rivers and bays.
- Designing and developing access sites in harmony with major infrastructure needs such as roads, utilities and schools can help to maximize benefits of dollars spent. Appropriate conservation practices developed as part of other infrastructure needs close to an access site may reduce the potential development impact of the access facility.



Underwater Grasses



Chesapeake Bay Program

Outcome: Sustain and increase the habitat benefits of underwater grasses in the Chesapeake Bay. Achieve and sustain the ultimate outcome of 185,000 acres of grasses Bay-wide necessary for a restored Bay. Progress toward this ultimate outcome will be measured against a target of 90,000 acres of 2017 and 130,000 acres by 2025.

Progress: Fifty-three percent of the outcome has been achieved.

Implementing these conservation practices:

- Nutrient management plan.
- Wetland and streamside wetland restoration.
- Agriculture stream restoration.
- Advanced grey infrastructure nutrient discovery program.

Also can benefit these outcomes!

- Wetlands.
- Blue crab abundance.
- Oyster.
- Stream health.
- Fish habitat.
- Forage fish.
- Drinking water protection/security.





What should I know about underwater grasses?

- Underwater grasses are integral to the life cycle of many bay creatures; it provides oxygen, food and shelter for blue crabs and juvenile rockfish, supporting the health of valuable commercial and recreational fisheries.
- Underwater grasses are sensitive to changes in water quality, particularly clarity. Large sediment and nutrient loads lead to impaired conditions; it needs sunlight to grow.
 - Avoid increases in nearby impervious surface
- Underwater grasses are sensitive to sea level rise; it requires adjacent non-hardened shoreline in order to migrate and sustain.





Outcome: Continually improve stream health and function throughout the watershed. Improve health and function of ten percent of stream miles above the 2008 baseline for the Chesapeake Bay watershed.

Progress: As of 2010, 43 percent of streams across the watershed were in fair, good or excellent condition.

Implementing these conservation practices:

- Forest conservation.
- Agricultural forest buffers.
- Urban forest buffers.
- Urban stream restoration.

Also benefit these outcomes!

- Brook trout.
- Healthy watersheds.
- Forest buffers.
- Flood control/mitigation.
- Protected lands.



What should I know about stream health?

- Healthy streams and floodplains provide benefits for water filtration, flood mitigation and recreational opportunities while removing public safety and infrastructure hazards.
- Threats to streams include increased water volume and velocity due to land use changes, channelization and erosion from human development, as well as alteration of habitat features and water quality that reflect riparian development.
- When functioning together, stream and wetland complexes should be considered a powerful resource for complete upland filtration and habitat benefits.

Toxic Contaminants





Goal: Ensure that the Bay and its rivers are free of effects of toxic contaminants on living resources and human health.

Progress: Eighty percent of the Chesapeake Bay and its tidal tributaries was partially or fully impaired by toxic contaminants in 2014.

Implementing these conservation practices:

- Narrow forest buffer.
- Agricultural forest buffer.
- Urban forest buffers.

Also benefit these outcomes:

- Urban pollutants.
- Agricultural pollutants.
- Stream health.
- Forage fish.
- Citizen stewardship.

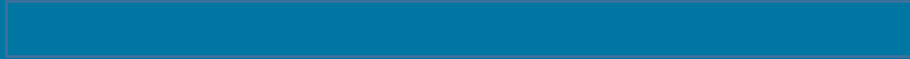


What should I know about toxic contaminants?

- Approximately 80 percent of the Bay's tidal water segments are at least partially impaired by one or more toxic contaminants, indicating that the problem is widespread.
- Contaminants vary by source sector and many are associated with either agricultural or urban land uses.
- Toxic contaminants can be partially controlled through practices that manage sediment—this applies to all sectors (urban, agricultural, forested and open spaces).



Tree Canopy



Outcome: Continually increase urban tree canopy capacity to provide air quality, water quality and habitat benefits throughout the watershed. Expand urban tree canopy by 2,400 acres by 2025.

Progress: A formal indicator of progress for climate adaption and climate monitoring and assessment is under development.

Implementing these conservation practices:

- Agricultural forest buffers.
- Forest conservation.
- Urban forest buffers.

Also benefit these outcomes:

- Habitat biodiversity.
- Air quality.
- Land use methods.
- Fish habitats.
- Healthy watersheds.
- Forest buffers.



What should I know about tree canopy?

- Tree canopy provides numerous benefits to human and watershed health.
- The shading powers of tree canopy produce energy savings to homeowners, businesses, local governments and utilities.
- Trees are the 'green infrastructure' of communities. Green stormwater infrastructure is designed to mimic the function of a natural forest. Tree intercept and slow the delivery of stormwater runoff to local waterways while filtering and taking up pollutants.

Wetlands





Outcome: Continually increase the capacity of wetlands to provide water quality and habitat benefits throughout the watershed. Create or re-establish 85,000 acres of tidal and non-tidal wetlands and enhance the function of an additional 150,000 acres of degraded wetlands by 2025. These activities may occur in any land use (including urban) but primarily occur in agricultural or natural landscapes.

Progress: As of 2015, nine percent of the outcome has been achieved.

Implementing these outcomes:

- Wetlands.
- Wet ponds.
- Urban forest buffers.

Also benefit these outcomes:

- Black ducks.
- Climate adaption.
- Flood control/mitigation.
- Groundwater recharge/infiltration.
- Recreation.



- Wetlands provide areas of infiltration for water and runoff to connect with the groundwater, thus filtering pollutants and toxins and recharging below ground reserves, while also creating vital habitat patches for wildlife which provide hunting and recreational opportunities with economic benefits to surrounding communities.
- Wetlands are threatened by direct land use conversion as well as development and land use changes that affect groundwater flow patterns, which can isolate wetlands from the rest of the landscape or permanently remove the source of water.
- When functioning together, wetland and stream complexes should be considered a powerful resource for complete upland filtration and habitat benefits.



Therefore.....

Co-benefits can be powerful!



Name
Title
Organization
Email
Phone Number



Chesapeake Bay Program
Science. Restoration. Partnership.

Standard Language for WIPs

- One of the requests from the states during the survey
- First draft developed
- Need comments back in two weeks
- Finalize by the end of March



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION



Chesapeake Bay Program Office

Contact Information:

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717-772-4053

DEP Chesapeake Bay Program Website:

<http://www.dep.pa.gov/ChesapeakeBay>

Phase 3 WIP Website:

www.dep.pa.gov/chesapeakebay/phase3