

Deer Creek Watershed Restoration Action Strategy

Harford County, Maryland

July 2007

Prepared for:

**Harford County
Department of Planning and Zoning
220 South Main Street
Bel Air, Maryland 21014**

Prepared by:

**KCI Technologies, Inc.
10 North Park Drive
Hunt Valley, Maryland 21030**

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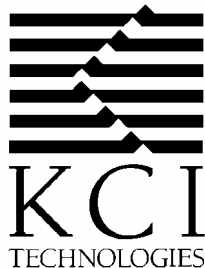
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In Consultation with the
Deer Creek Stakeholder Committee

Acknowledgement

Deer Creek Stakeholder Committee

The Deer Creek WRAS was developed with cooperation and input from citizen organizations and local, state and federal agencies that represent the interests of the Deer Creek watershed.

<i>Organization</i>	<i>Representative</i>
Landowners	Lee McDaniel, Gene Umbarger, Tim Hopkins, Aberdeen Proving Grounds (Jim Bailey), Eden Mill Nature Committee, Isaak Walton League
Deer Creek Watershed Association, Inc.	Lee McDaniel
Harford County Soil Conservation District	Gary Davis
Deer Creek Scenic Rivers Board	Lee McDaniel
Harford County Forestry Board	Charles Day
Harford County Farm Bureau	Candace Lohr
Harford Land Trust	Stephanie Stone
Deer Creek Rural Legacy Board	Charles Day and Lee McDaniel
Lower Susquehanna Heritage Greenway	Mary Ann Lisanti
Izaak Walton League	Jim Thomas
Watershed Alliance of York (PA)	Gary Peacock
Harford County Agriculture Preservation Board	Gene Umbarger
Susquehanna River Basin Commission	Susan Buda
Homebuilders Association	Tim Hopkins
Eden Mill Nature Committee	Mike Kohler and Lou Etgen
Harford Community College	Tami Imbierowicz
Upper Western Shore Tributary Team	Carrie Decker, Stephanie Stone, Lee McDaniel, Pat Pudelkewicz, Christine Buckley, Gary Davis, Jim Bailey
Aberdeen Proving Grounds	Jim Bailey
National Park Service	Wink Hastings
Baltimore County Department of Environmental Protection and Resource Management	Steve Stewart
Harford County Planning and Zoning	Pat Pudelkewicz (Project Manager), Matt Kropp, Bill Amoss, Michele Bynum, Nick Walls
Harford County Public Works	Christine Buckley, Michele Dobson
Harford Parks and Recreation	Arden McClune
Maryland Department of Natural Resources (MDNR)	Jon Neuendorff and David Taylor (State Parks), Kevin Smith
Maryland Department of the Environment (MDE)	Danielle Lucid (WRAS Program Manager)

Development of the Deer Creek WRAS was supported technically by the following assessments and technical reports:

<i>Technical Report</i>	<i>Representative</i>
Synoptic Survey	Niles Primrose MDE
Watershed Characterization	Rita Bruckler, Kathleen Ellis, Danielle Lucid, MDE; Ken Shanks, MDNR
Stream Corridor Assessment	Robin Pellicano, MDE
Aquatic Conservation Targets	Jay Killian, Scott Stranko, Jason Frentress, MDNR

The KCI Project Team:

<i>Staff</i>	<i>Responsibilities</i>
Mike Pieper	Environmental Scientist, Project Manager
Bill Frost	Project Engineer
Andrea Poling	Environmental Scientist, GIS Analyst

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Acronyms

ACT	Aquatic Conservation Targets
ACUB	Army Compatible Use Buffer
APG	Aberdeen Proving Grounds
BIBI	Benthic Index of Biotic Integrity
BMP	Best Management Practice
CBCA	Chesapeake Bay Critical Area
CDS	Conservation Development Standards
CIP	Capital Improvement Program
CREP	Conservation Reserve Enhancement Program
CWP	Center for Watershed Protection
CWAP	Maryland Clean Water Action Plan
COMAR	Code of Maryland Regulations
DO	Dissolved Oxygen
DPW	Harford County Department of Public Works
EPA	U.S. Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FIBI	Fish Index of Biotic Integrity
FIDS	Forest Interior Dwelling Species
GIS	Geographic Information System
GNIS	Geographic Names Information System
HCALP	Harford County Agricultural Land Preservation
HLS	Habitat of Local Significance
LSHG	Lower Susquehanna Heritage Greenway
MACS	Maryland Agricultural Water Quality Cost Share
MALPF	Maryland Agricultural Land Preservation Funding
MBSS	Maryland Biological Stream Survey
MCC	Maryland Conservation Corps
MDE	Maryland Department of the Environment
MDNR	Maryland Department of Natural Resources
MDP	Maryland Department of Planning

MET	Maryland Environmental Trust
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System, Stormwater Permits Program
NRCS	Natural Resources Conservation Service
NTU	Nephelometer Turbidity Units, measure of water clarity
PDR	Purchase of Development Rights
PFA	Priority Funding Area
RESAC	Regional Earth Science Applications Center
SCA	Stream Corridor Assessment
SCD	Harford Soil Conservation District
SRBC	Susquehanna River Basin Commission
SSPRA	Sensitive Species Project Review Area
SWM	Stormwater Management
TDR	Transfer of Development Rights
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAY	Watershed Alliance of York
WHIP	Wildlife Habitat Incentives Program
WIP	Woodlands Incentive Program
WRAS	Watershed Restoration Action Strategy
WRP	Wetlands Reserve Program
WSSC	Wetland of Special State Concern
WTM	Watershed Treatment Model
YCPC	York County Planning Commission

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Executive Summary

The Deer Creek Watershed Restoration Action Strategy (WRAS) was initiated by the Harford County Department of Planning and Zoning to help restore and protect the Deer Creek Watershed. The goal of the WRAS is to protect water quality, conserve fish and wildlife habitats, and restore those areas found to be impaired. The WRAS program is a statewide program that is implemented at the local level with public input and review. The WRAS is a planning document that defines the issues that affect watershed health and provides potential solutions, or management strategies that watershed and landuse managers can use to correct them. The strategies developed in the WRAS work in concert with other existing state and county programs to restore and protect Maryland's waterways and meet the goals of the Chesapeake 2000 Agreement.

The Deer Creek Watershed is 171 square miles in size and is located in Harford and Baltimore Counties in Maryland and York County Pennsylvania. The Deer Creek flows to a confluence with the Susquehanna River. Close to 80 percent of the Watershed is located in Harford County. The Watershed retains a predominantly rural character with land use that is primarily agricultural (54 percent) and forest (30 percent). Less than one percent of the Watershed area lies within Harford County's development envelope and it has an overall existing imperviousness of only 4.3 percent.

The Deer Creek is a State Scenic River and Stream Use classifications include both natural and recreational trout waters. The Watershed is home to many rare, threatened and endangered species and maintains a high level of biodiversity. Sensitive terrestrial habitats are also present including Critical Areas, non-tidal Wetlands of Special State Concern and Habitats of Local Significance.

The Deer Creek Stakeholder Committee, organized for this Study and broadly representative of interests within the watershed, collaboratively identified the Watershed's current assets and set a vision for the desired condition of the watershed. The Committee articulated a vision for the watershed describing a desired future condition to guide the preparation of the Strategy.

We envision a healthy, vibrant Deer Creek Watershed by preserving high quality streams and rivers supportive of diverse aquatic life and conserving our treasured natural resources for this and future generations. We celebrate today's rural legacy of farms, forests, historic villages, and scenic parklands.

Based on this vision, the Committee then set goals and objectives in the areas of Agriculture, Natural Resources, Development, Outreach and Education and Interjurisdictional Coordination. The Deer Creek WRAS Management Strategies were built around the

framework provided by the goals and objectives and include both specific projects and broad strategies applicable to the entire Deer Creek Watershed.

Development of the Deer Creek WRAS relies heavily on technical studies that are a part of the WRAS process including the Watershed Characterization, Synoptic Survey, Stream Corridor Assessment and Maryland Biological Stream Survey. Using data from these studies as well as additional analysis of land use, impervious cover and pollutant loading as indicators, the Deer Creek's subwatersheds were prioritized to identify those areas that are degraded and most in need of *restoration*, and those areas that are of high quality or vulnerable to change, and most in need of *protection*. The overriding theme is that the management strategies will be *targeted* for implementation whenever possible in the highest priority restoration and protection subwatersheds.

Based on the Deer Creek's conditions the *highest priority* strategies are focused on agricultural BMPs, riparian buffer planting, land preservation, and outreach. Harford County Government and the Harford Soil Conservation District will take the lead role in the implementation phase of the plan and success tracking with major support from the Deer Creek WRAS Stakeholder Committee.

1 Introduction

The Deer Creek Watershed Restoration Action Strategy (WRAS) was initiated by the Harford County Department of Planning and Zoning in 2005 to identify and prioritize those subwatersheds and stream systems that are degraded and in need of management efforts and those resources that are of high quality and are in need of protection.

1.1 Deer Creek Watershed Background

The Deer Creek Watershed is the largest watershed in Harford County, covering 38 percent of the County's land area. Other major watersheds in the County include the Bush River, Broad Creek and the Gunpowder River. The entire watershed covers approximately 109,400 acres (171 square miles) across two states and three counties. In Maryland there are 86,000 acres in Harford County, and 7,160 acres in Baltimore County. The Pennsylvania portion of the watershed lies in York County and covers 16,250 acres (see Maps 1 and 2, below).

The Deer Creek flows from its headwaters in York and Baltimore Counties in a southeasterly direction to a confluence with the Susquehanna River near Susquehanna State Park. Deer Creek lies in the Piedmont physiographic region and is part of the Upper Western Shore Basin.

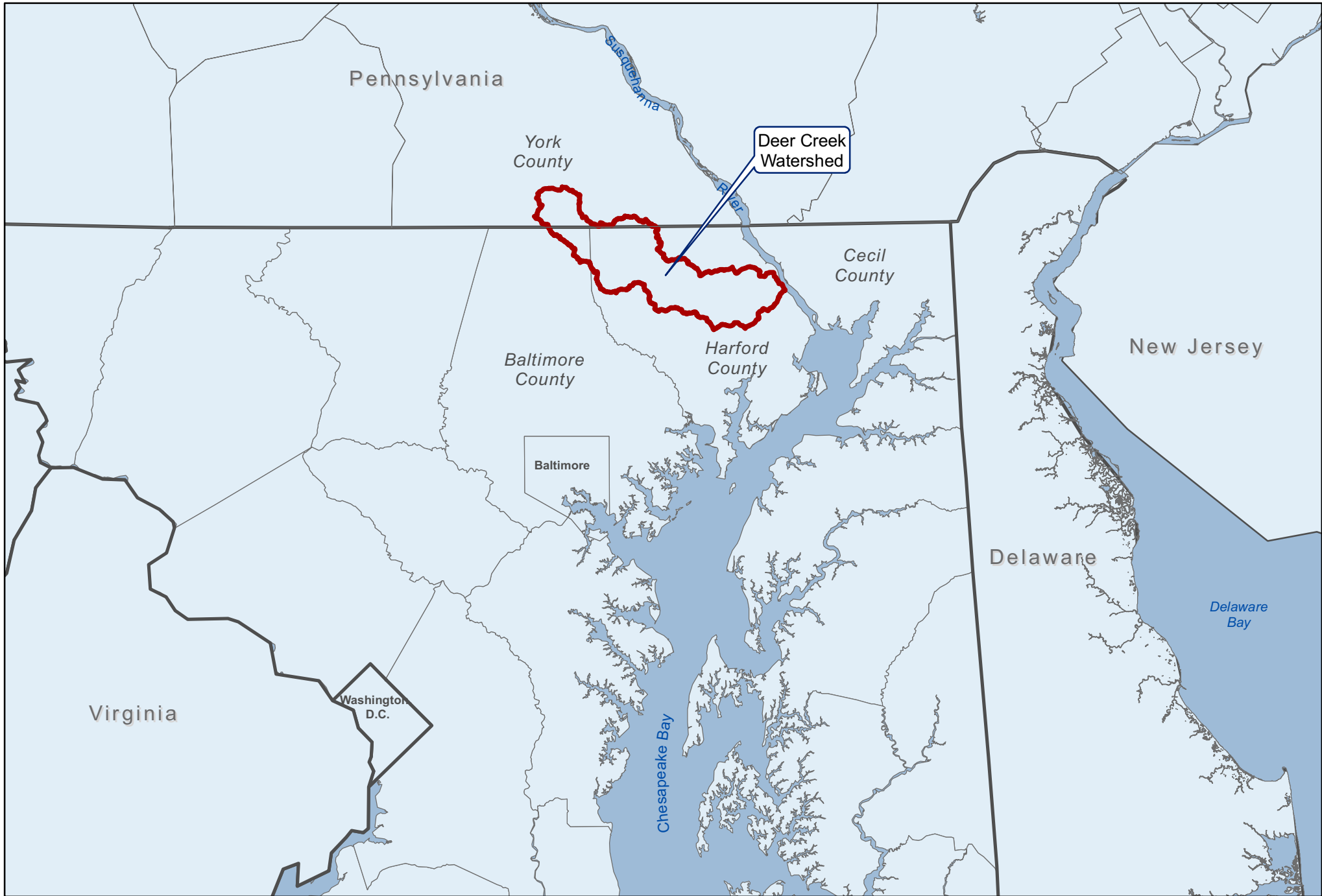
Land use in the Watershed has been historically agricultural. The area retains its agricultural heritage through preservation programs and the watershed lies outside the County's "development envelope." As of 2002 the Harford County portion of the watershed is comprised of agricultural use (54 percent), forest (30 percent) and developed land (15 percent).

Sensitive species in the Watershed include the bald eagle, bog turtle, Davis' sedge, butternut, brook trout, Maryland darter and the logperch. The Deer Creek was named a State Scenic River in 1973; a local Scenic River Advisory Board has been established to promote the protection of the natural and cultural values of Deer Creek. Many streams in the Watershed are designated trout waters.

1.2 WRAS Purpose and Process

Overview

In 1998, the Maryland Clean Water Action Plan (CWAP) (MDNR, 1998) categorized all 127 of Maryland's eight-digit watersheds for restoration, and protection priority. The Deer Creek was listed as both a Category 1 watershed in need of restoration and a Category 3 watershed indicating that protection measures are also needed. The Deer Creek was further listed as a "Select" Category 3 watershed, which indicates a more pristine or sensitive watershed in need of higher levels of protection.



-  State Boundary
-  County Boundary
-  Major Waterbodies
-  Deer Creek Watershed

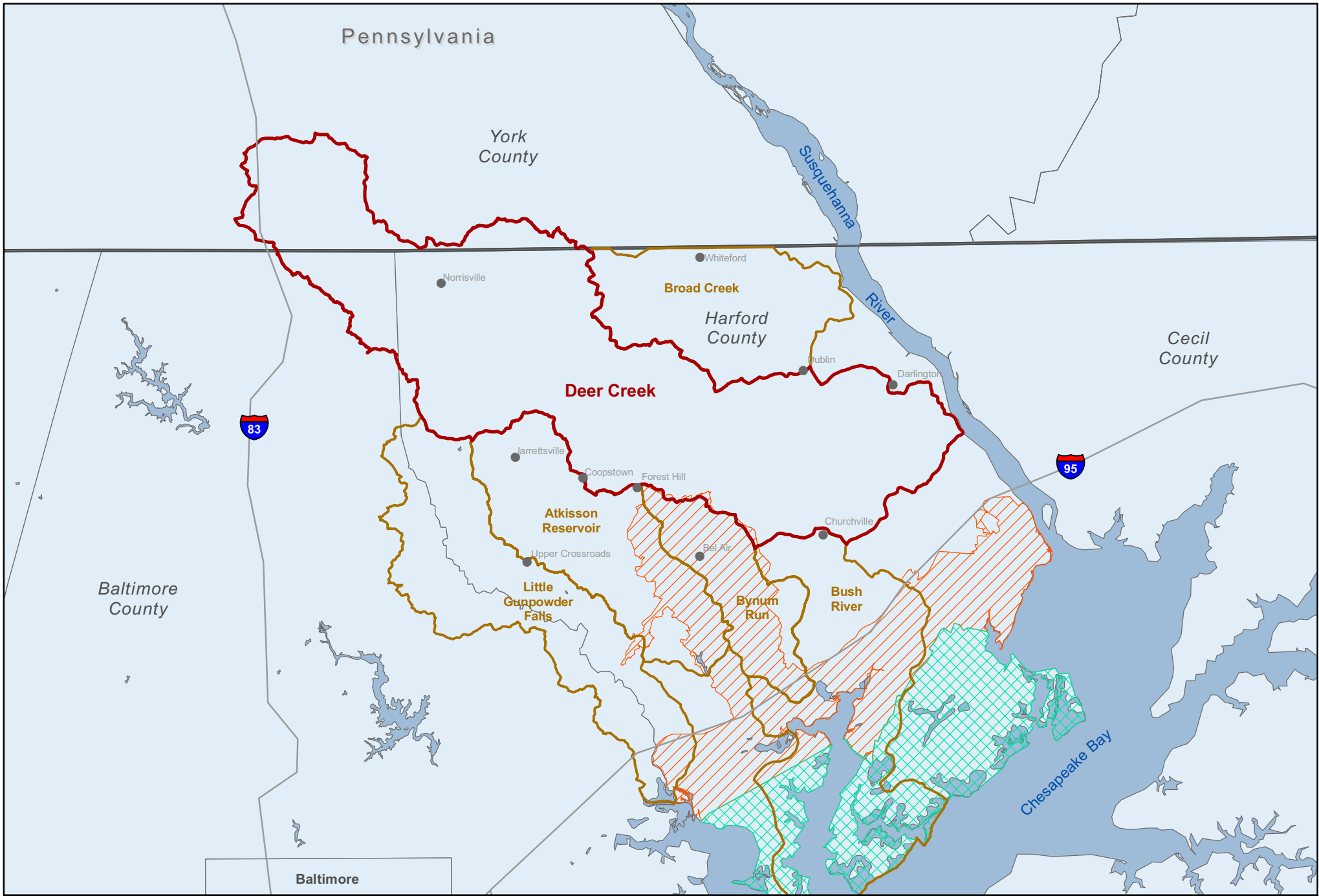


1 inch equals 14 miles

DEER CREEK
Watershed Restoration Action Strategy

Map 1: Vicinity Map





- Deer Creek Watershed
- Adjacent 8-Digit Watersheds
- Aberdeen Proving Ground
- Development Envelope


 NORTH
 1 inch equals 5 miles

DEER CREEK
Watershed Restoration Action Strategy
Map 2: Watershed Location Map



The CWAP laid the foundation for the WRAS program which was initiated in 2000 as a long term means to characterizing watershed conditions and developing management plans for water quality and habitat restoration and preservation. The WRAS program moves Maryland towards meeting its Chesapeake 2000 Agreement goals.

The WRAS program is intended to work in concert with existing programs such as the Tributary Strategy Program, MDE's Source Water Protection Program, MDE's Total Maximum Daily Load (TMDL) Program and Maryland's National Pollutant Discharge Elimination System (NPDES) Stormwater Permits Program.

The WRAS program is coordinated at the state level by MDE and MDNR and has the support of MDNR's Coastal Zone Division and MDNR's Non Point Source Program. Local governments, with collaboration from citizens and stakeholders hold the primary responsibility for developing the individual WRASs and coordinating implementation. To date, 25 WRASs have either been completed or are in development.

Harford County and Deer Creek

The 2004 Harford County Master Plan and Land Use Element Plan lays out the major policies of the County for addressing future growth and preservation and protection of agricultural and natural resources. The current plan continues the concept of a "Development Envelope", first introduced in the 1977 Master Plan, in which a specific geographic area is designated for planned development. Less than 1 percent of the Deer Creek watershed lies within this "Development Envelope."

Preservation of the rural heritage of the County and protection of the natural environment are major goals addressed in the Land Use Element Plan:

- Goal: Preserve and protect the County's natural environment
- Goal: Protect and preserve the County's agricultural heritage and the continued viability of agriculture

Protection of the County's natural environment focuses on maintaining high quality surface and groundwater resources, and protecting and enhancing the County's wetland and forest resources, open space and greenways, and riparian buffers. Watershed planning is identified as an important tool in this effort.

Protection of its agricultural and rural heritage is of great importance to the County. Many efforts are currently underway to maintain the County's agricultural industry, ranging from a nationally recognized agricultural preservation program to an Agricultural Economic Development initiative addressing the economic viability of agriculture.

The WRAS process supports the goals of the Harford County Master Plan and Land Use Element Plan and strives to address ways to ensure the preservation and protection of the agricultural, water quality and ecological resources of the watershed.

As a means to meet the Plan's guiding principles, Harford County completed a WRAS for the Bush River in 2003. The Bush River Watershed includes approximately 25 percent of the County. With completion of the Deer Creek WRAS, 67 percent of the County will be under current watershed management plans.

The Deer Creek WRAS process began in 2005 with acquisition of grant funding and initiation of the supporting technical studies including the Watershed Characterization, Synoptic Survey and Stream Corridor Assessment (<http://dnr.md.gov/watersheds/surf/proj/wras.html>). The formation of the Deer Creek Stakeholder Committee followed. The Committee met to collaboratively identify the Watershed's current assets and to develop goals and a vision of the desired future conditions.

2 Vision, Goals and Objectives

2.1 Vision Statement

The Deer Creek Stakeholder Committee adopted the following vision statement that would guide the development of the WRAS.

We envision a healthy, vibrant Deer Creek Watershed by preserving high quality streams and rivers supportive of diverse aquatic life and conserving our treasured natural resources for this and future generations. We celebrate today’s rural legacy of farms, forests, historic villages, and scenic parklands.

2.2 WRAS Goals

The goals and vision for the Deer Creek Watershed are based on, and grew out of, the Watershed assets and desired future conditions. The assets and future conditions were developed by the Deer Creek Stakeholder Committee.

Table 1: Deer Creek Watershed Assets

Predominance of agricultural land use	Economic value of Natural Resources
Rural legacy and Agricultural Preservation Areas	Soils – Agricultural productivity and Stormwater Receptor capability
Historical settlement patterns and structures	Forestlands
National Historic Districts	Water resources and source water
Parklands – Rocks State Park, Eden Mill Nature Center, Susquehanna State Park	Unique wetland habitats
Recreational benefits	Neotropical bird habitat
Waterfalls – Kilgore Falls, Falling Branch	Unique flora and fauna
Viewsheds	Lower Susquehanna Heritage Greenway

Table 2: Desired Future Conditions

Maintain rural industries	Improve water quality
Maintain Village character – Darlington and others	Greater Lower Susquehanna Heritage Greenway connections and protection of resources
Additional public lands with greater access	Greater protection of valuable resources
Increased tourism capacity	Greater riparian buffers
Maintain relative distribution of assets	Improve natural hydrologic flows
Continued funding for preservation of agricultural and natural resources	Increased educational opportunities and interpretation of history, culture and natural environment

Broad goals for the WRAS include those developed by the Chesapeake 2000 Watershed Commitments Task Force.

- Address the protection, conservation and restoration of stream corridors, riparian forest buffers and wetlands,
- Improve habitat and water quality,
- Identify implementation objectives, and
- Have demonstrated local support.

In addition the Environmental Protection Agency (EPA) has identified several Watershed Plan Elements (Section 319 of the Clean Water Act) that will be addressed by the WRAS. The elements are listed below with the WRAS sections that address each:

- A. Identification of pollutant causes and sources to achieve load reductions addressed in watershed management plan, (3.2, 3.7, 7.3)
- B. Estimate of load reductions anticipated to be achieved through management measures specified below, (7.3)
- C. Description of non point source management measures necessary to achieve load reductions, (6, 7.3)
- D. Estimate of technical and financial assistance, cost, and authorities necessary to implement the watershed management plan, (6, 7.6)
- E. Information or education component to enhance public understanding of watershed management, (6)
- F. Schedule for implementing the non point source management measures specified in plan, (6)

- G. Interim, measurable milestones to determine implementation of non point source management measures, (6)
- H. Criteria to determine if load reductions are being achieved, and a (6, 7.5)
- I. Monitoring component to evaluate effectiveness of implementation efforts (7.5)

The final goals and objectives of the Deer Creek WRAS are listed below. They are split into several categories; Agriculture, Development, Natural Resources, Education and Outreach, and Interjurisdictional Coordination. The goals and objectives in each of these categories became the framework for which the Management Strategies were constructed. The Deer Creek WRAS is developed based on a 10 year planning horizon.

Table 3: Goals and Objectives

AGRICULTURE	
Goal	Promote the recognition of the value of farming, awareness of best management practices, preservation of farmland and financial resources necessary for their implementation.
Objective 1	Promote the awareness of and implement best management practices in agricultural areas in order to protect water quality.
Objective 2	Preserve agricultural land to maintain the rural character of the watershed and preserve habitats.
NATURAL RESOURCES	
Goal	Manage natural resources on a sustainable basis, including forests, wetlands, stream corridors, sensitive species and wildlife.
Objective 1	Protect and restore stream corridors.
Objective 2	Protect and restore forest and wetland resources.
Objective 3	Protect sensitive species habitat in order to maintain a high level biodiversity.
Objective 4	Undertake additional research in order to protect and improve water quality and natural resources.
DEVELOPMENT	
Goal	Utilize sustainable development and implementation approaches to manage impervious surfaces and protect water quality.
Objective 1	Minimize the impacts of new development.
Objective 2	Reduce the impact of existing development on water quality and natural resources.

EDUCATION AND OUTREACH

- | | |
|-------------|---|
| Goal | Develop and promote watershed awareness and stewardship. |
| Objective 1 | Promote a stewardship ethic among residents in the watershed through an understanding of watershed values and issues. |
| Objective 2 | Promote projects that encourage public access and public environmentally-oriented education and recreation. |
-

INTERJURISDICTIONAL COORDINATION

- | | |
|------|--|
| Goal | Network with regional jurisdictions to address common goals of water quality protection and environmental stewardship. |
|------|--|
-