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# Buffalo Creek Watershed Conservation Plan

Armstrong, Butler and Allegheny Counties, Pennsylvania

September 2008

**THE PENNSYLVANIA RIVERS  
CONSERVATION PROGRAM**

**BUFFALO CREEK WATERSHED  
CONSERVATION PLAN**

**Armstrong, Butler, and Allegheny Counties, Pennsylvania**

**AUDUBON SOCIETY OF WESTERN PENNSYLVANIA  
PITTSBURGH, PENNSYLVANIA**



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Photographs by George Reese or Brian Shena unless noted otherwise.

## **LIST OF ACRONYMS AND ABBREVIATIONS**

ACC	Armstrong County Conservancy
Act 537	The Pennsylvania Sewage Facilities Act
Act 167	The Pennsylvania Storm Water Management Act
ALARM	Aquatic Resource Monitoring
AMD	Abandoned Mine Drainage
ASA	Agricultural Security Areas
ASWP	Audubon Society of Western Pennsylvania
BBS	Breeding Bird Survey
BFTC	Ben Franklin Technology Center
BMPs	Best Management Practices
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CFS	Cubic Feet per Second
CREP	Conservation Reserve Enhancement Program
CWA	Clean Water Act
CWF	Cold Water Fisheries
DHALO	Delayed Harvest Artificial Lure Only
EPA (or USEPA)	United States Environmental Protection Agency
EV	Exceptional Value Waters
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FSA	Farm Service Agency

**LIST OF ACRONYMS AND ABBREVIATIONS  
(Continued)**

FT	Federal Threatened
HSCA	The Pennsylvania Hazardous Sites Cleanup Act
HQ	High Quality Waters
IBA	Important Bird Area
MF	Migratory Fisheries
MPC	Municipalities Planning Code
NPL	National Priorities List
NRHP (or NR Status)	National Register of Historic Places
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
NWOA	National Woodland Owners Association
PA DCNR (or DCNR)	Pennsylvania Department of Natural Resources and Conservation
PaDEP (or DEP)	Pennsylvania Department of Environmental Protection
PBS	Pennsylvania Biological Survey
PCBs	polychlorinated biphenyls
PDCED (or DCED)	Pennsylvania Department of Community and Economic Development
PE	Pennsylvania Endangered
PennDOT	Pennsylvania Department of Transportation
PFA	Pennsylvania Forestry Association
PFB	Pennsylvania Farm Bureau
PFBC	Pennsylvania Fish and Boat Commission
PGC	Pennsylvania Game Commission

**LIST OF ACRONYMS AND ABBREVIATIONS  
(Continued)**

PHFA	Pennsylvania Housing Finance Agency
PHMC	Pennsylvania Historical and Museum Commission
PIF	Partners In Flight
PT	Pennsylvania Threatened
QA/QC	Quality Assurance and Quality Control
RCRA	The Resource Conservation and Recovery Act
SCC	Pennsylvania Biological Survey Species of Conservation Concern
SGL	State Game Land
TMDL	Total Maximum Daily Load
TSF	Trout Stocking Fisheries
TU	Trout Unlimited
UNT	Unnamed Tributary
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USDA	United States Department of Agriculture
USGS	United States Geological Survey
VOC(s)	Volatile Organic Compound(s)
WPC	Western Pennsylvania Conservancy
WWF	Warm Water Fisheries

## **EXECUTIVE SUMMARY**

## **EXECUTIVE SUMMARY**

Buffalo Creek is the largest tributary on the west side of the Allegheny River between Franklin (French Creek) and the Ohio. The watershed drains 171 square miles of eastern Butler, western Armstrong, and northern Allegheny Counties in western Pennsylvania. From its headwaters in Butler County the stream flows 34.4 miles to the Allegheny River at Freeport, Armstrong County (Figure ES-1).

Since the earliest period of English settlement, the “Buffalo Country” has been recognized as a unique area. In 1889 W.E. Clyde Todd, later to become an internationally renowned ornithologist, made his first visit to the Buffalo Creek valley. What he found in the rugged topography was a relict of the primeval Pennsylvania forests. Hidden in the valleys of Armstrong and Butler Counties were stands of massive northern conifers and hardwoods, dominated by Eastern Hemlock and White Pine.

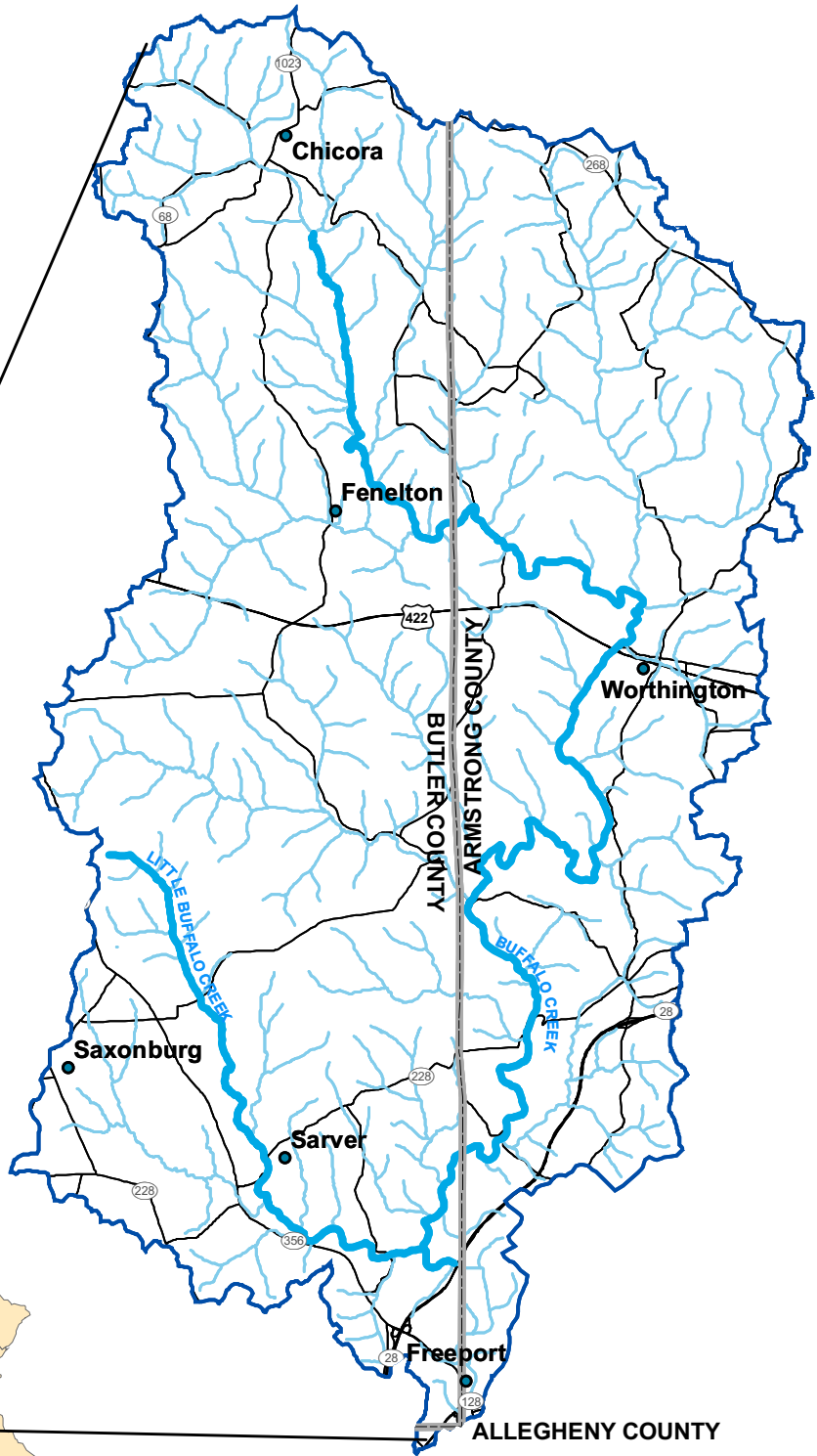
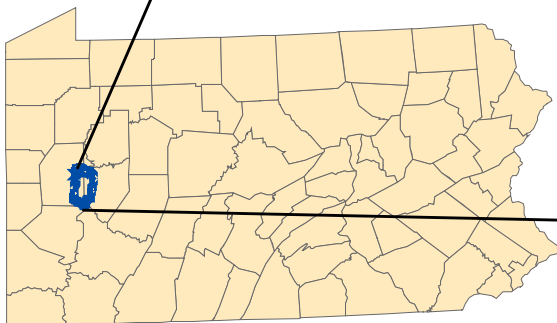
Much has changed. The uplands are much less intensively farmed now. Second growth woodlands, scattered residences, and subdivisions occupy what was once an agricultural landscape. The virgin stands of hemlock and pines are gone. But what is remarkable is how much has remained. Because of its rugged topography, the land still bears a heavy mantle of trees. When seen on a large-scale map, it is one of the closest green islands to Pittsburgh and its sprawling suburbs.

## **PROJECT BACKGROUND**





The development of a River Conservation Plan for the Buffalo Creek Watershed is an initiative of Audubon Society of Western Pennsylvania (ASWP). Founded in 1916, ASWP works to inspire and educate the people of southwestern Pennsylvania to be respectful stewards of the natural world.

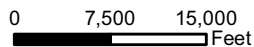
The Pennsylvania Rivers Conservation Program was established by the Pennsylvania Department of Conservation and Natural Resources (DCNR) to conserve and enhance river resources through preparation and accomplishment of locally initiated river conservation plans. The program provides technical and financial assistance to municipalities and river support groups to carry out planning, implementation, acquisition and development activities and is funded through the Keystone Recreation, Park and Conservation Act. ASWP has received funding from DCNR to develop a River Conservation Plan for the Buffalo Creek Watershed.

The River Conservation Plan is a comprehensive watershed- or river-corridor-based study identifying significant natural, recreational and cultural resources. Issues, concerns and threats to resources and values are determined locally as part of planning, and methods to conserve, restore, and enhance and waterways are recommended. Upon completion of a Conservation Plan, the watershed is eligible for listing on the Pennsylvania River Registry. The registry recognizes rivers in communities that have completed conservation plans. It is also an avenue to endorse local initiatives by binding them together in a statewide recognition program. In order for a river to be placed on the registry, it must have an approved plan and local municipal support. Registry status must be achieved to qualify for additional implementation, development or acquisition grants.



**LEGEND**

-  BUFFALO CREEK WATERSHED BOUNDARY
-  MAJOR TOWNS
-  MAJOR STREAMS
-  MAJOR ROADS



**FIGURE ES-1**  
**WATERSHED LOCATION MAP**  
**BUFFALO CREEK WATERSHED**



DRAWN BY: AML  
CHECKED: AJB

DATE: 01/31/2007  
APPROVED: GTR



Our watershed contains a wealth of ecological, recreational, and cultural resources. Both opportunities and challenges await in the future. These issues require that the watershed's stakeholders find common ground, and plan for the future with common goals. The Buffalo Creek Watershed Conservation Plan will provide a vehicle to accomplish this. By finding common ground, facilitated through the Conservation Plan, stakeholders can provide for the long-term viability and sustainability of the watershed, its unique landscape and ecological features, and the quality of life for residents and visitors.

This plan is a guide to the land, water, biological, and cultural resources of the watershed resources and a compendium of ideas to restore, maintain, and enhance these resources. The plan is non-regulatory; it is intended strictly for informational and inspirational purposes.

The Buffalo Creek Watershed is one of the as-yet undiscovered treasures of western Pennsylvania. The overall intent of this plan is to encourage the responsible stewardship of this unique area. Arriving at appropriate solutions to issues that face the watershed requires that the watershed's stakeholders find common ground, and plan for the future with common goals. By finding common ground, facilitated through the plan, stakeholders can provide for the long-term viability and sustainability of the watershed, its unique landscape and ecological features, and the quality of life for residents and visitors. This plan has been produced through the efforts of local residents, and with the extensive participation of the watershed's residents, businesses, and municipalities. It is a document prepared by and for the watershed community.

The primary objectives of the plan include:

- Establish common ground and direction among stakeholders for the watershed;
- Provide a tool to help local decision makers to use in making informed decisions;
- Identify issues and concerns within the watershed;
- Identify initiatives for the protection and stewardship of the watershed;
- Qualify the watershed for admission to the Pennsylvania Rivers Conservation Registry.

An extensive public coordination effort has served as the foundation for the preparation of this plan. These efforts have been guided by a steering committee composed of local residents, businesses, community organizations, municipal leaders, and local and state agency representatives. The public coordination process conducted to date has been designed to maximize opportunities for input and comment, and has included public meetings, distribution of surveys and newsletters, meetings with community organizations, interviews with stakeholders, and development of a project website.

The majority of land in the watershed is privately owned. Public lands represent approximately one percent of the watershed. The plan has been developed to be consistent with private property rights and landowner desires. To date, nine watershed

municipalities have provided letters of support for the Buffalo Creek Watershed Conservation Plan.

## **SECTION SUMMARIES**

The plan consists of seven primary sections. These are summarized below.

### **Project Area Characteristics**

Twenty-one municipalities are located wholly or partly within the 171 square-mile watershed. The watershed is somewhat unique in western Pennsylvania in that it is experiencing population growth. Butler County was the only county in western and northern Pennsylvania that exceeded the national rate of growth during the 1990s.

In 2000, the total population of communities located within the watershed was 65,046, a gain of 4 percent from 1990. The median age of communities in the watershed typically is older than the state as a whole. The construction/ manufacturing sector is typically the largest individual employment sector in most watershed communities.

Land use in Pennsylvania is primarily controlled through local zoning ordinances. Overall direction is often provided through comprehensive plans that identify county or municipal policies and identify conceptual land use plans. Of the 21 municipalities in the watershed, 12 have comprehensive plans, 11 have zoning ordinances, and 11 have subdivision ordinances.

Infrastructure influences land use patterns. All watershed communities have an Act 537 Plan for sewage management. The majority of these plans are 20 years old or more. Six community sewage systems serve higher population areas within the watershed. Each county within the watershed has an agency designated to enforce Act 537 Plans. Residents and businesses in the majority of the watershed rely on private wells to supply potable water needs. Ten community suppliers provide water to limited areas of high population density. The watershed has an adequate highway network. Railroad lines were formerly much more extensive; many former rail lines have been abandoned or developed into rail trails.

### **Land Resources**

The Buffalo Creek watershed is typified by rolling uplands dissected by deeply entrenched valleys. The largest and deepest of these valleys, created by the lower reaches of Buffalo and Little Buffalo Creeks, form gorges with precipitous slopes and sandstone cliffs. The watershed has a total relief of nearly 800 feet, with elevations ranging from approximately 1,525 feet to 745 feet. Eleven soil associations consisting of 30 soil series have been characterized within the watershed. Among these are a number of specific soils that are considered indicative of prime farmland.

Forest (63.0 percent) and agricultural (34.2 percent) land uses dominate the watershed as a whole. However, the percentage of these uses varies among subwatersheds, with the Lower Buffalo Creek and Little Buffalo Creek Watersheds having the highest percentage of urban land uses.

Nearly two-thirds of the land within the watershed is forested. These forests are almost all second growth stands. These forest resources currently have a large local economic impact. The vast majority of forest resources within the watershed are privately managed and have traditionally operated under diameter-limited harvests.

Agriculture has suffered substantial declines in recent decades. There are various reasons for these declines. A number of communities have implemented programs to help maintain agriculture in the watershed. There are presently 14,354 acres of Agricultural Security Areas in the watershed.

Mining and mineral extraction have historically been significant in the economic development of the watershed. Oil fields in the northern portion of the watershed were developed as part of the world's first oil boom in the 1870s. Coal has been extracted at various locations throughout the watershed, and limestone and sandstone mining are also substantial industries in some locations.

### **Water Resources**

Buffalo Creek arises in Butler County north of the borough of Chicora. The mainstem extends 34.4 miles to the Allegheny River at Freeport. The watershed contains at least 341 miles of perennial and intermittent streams. Buffalo Creek is unique among the major Allegheny River tributaries in this area in that it has maintained relatively good water quality through the rise and decline of industry in western Pennsylvania. It bears an additional distinction of being one of the only free-flowing major Allegheny tributaries.

Major tributaries include Little Buffalo Run, Patterson Run, Rough Run, and Little Buffalo Creek. For descriptive and planning purposes, seven major subwatersheds have been identified. These include the Upper Buffalo Creek, Central Buffalo Creek, Patterson Run, Little Buffalo Run, Rough Run, Little Buffalo Creek, and Lower Buffalo Creek subwatersheds.

Water quality in the Buffalo Creek watershed is generally recognized to be better than most streams in the Lower Allegheny River drainage. The PaDEP identifies use classifications for waters of the Commonwealth under 25 Pa. Code §93.1. Most of the Buffalo Creek Watershed has been designated as High Quality waters. Only the portion of the watershed downstream of the mouth of Little Buffalo Creek does not carry an HQ designation.

According to PaDEP, 83 stream segments in the watershed require a Total Maximum Daily Load to be developed. Predominant causes of degradation are siltation, nutrients, and metals. The primary sources for siltation and nutrients is agriculture, with abandoned mine drainage the source of metals contamination. Coal mining has occurred extensively in the watershed, and although little AMD degradation is obvious, a combination of factors may obscure the actual effects of AMD.

Due to topographic conditions, wetlands are not extensive in the watershed. Natural wetlands are largely restricted to floodplains of streams and relatively level headwater areas. Several larger wetland communities are present, primarily in the upper portions of the watershed.

Flood damage is typically related to abnormally high rainfall rather than snowmelt or ice dams. All of the communities within the watershed participate in National Flood Program. The current flood maps for many municipalities in the watershed are 20 or more years old.

Residents and businesses in the majority of the watershed rely on private wells to supply potable water needs and on-lot septic systems for sewerage discharge. Stormwater issues are of increasing concern in the watershed due to increasing residential and commercial development. There is currently no Act 167 Plan in effect or under development for the overall Buffalo Creek Watershed. A number of municipalities are in the process of implementing ordinances based on Pennsylvania's model stormwater ordinance.

### **Biological Resources**

The high diversity of biological resources in the Buffalo Creek Watershed has been noted and commented upon for over a century. This remarkable historical record is unique. The biodiversity of the region presents a regional legacy worthy of responsible stewardship, an important contribution to the quality of life to area residents, and an important economic element both as a natural resource and as a regional tourism resource.

A number of noteworthy habitats occur within the watershed. The largest of these are the extensive areas of deciduous forest habitat that occur in much of the watershed. The steep and narrow ravines of a number of tributary streams support outstanding examples of northern hardwoods – conifer forest communities. Several large wetland areas occur in the central and upper main stem watersheds and along the floodplain of Little Buffalo Run.

The watershed has been identified as the Buffalo Creek Valley Important Bird Area by the National Audubon Society. In addition, locations in the Upper Buffalo Creek subwatershed have been identified as Important Mammal Areas 6 and 7 by the Mammal Technical Committee of the Pennsylvania Biological Survey. Seventeen specific areas of conservation concern have been identified within the watershed for this plan.

At least 70 species of conservation concern occur in the watershed. Many of these are birds that depend upon forest interior habitats, which the watershed contains in abundance. The Eastern Massasauga Rattlesnake (*Sistrurus catenatus*), a Pennsylvania endangered species, reaches the southeastern limit of its range in the watershed.

The presently high population levels of the White-tailed deer (*Odocoileus virginianus*) pose a threat to the ecological health of the watershed ecosystem. If left unchecked, deer will have lasting and irreversible effects on the state of the ecology and diversity within the watershed and beyond. Invasive species are an increasingly serious threat to natural ecosystems in the watershed. Japanese Knotweed (*Polygonum cuspidatum*) presently represents the most serious and immediate threat to the watershed. Immediate and long-term action is required to prevent its spread to upstream areas.

## **Cultural Resources**

Outdoor recreation has long been a vital quality of life issue to residents. Popular activities within the watershed include hiking, fishing, hunting, bird watching, bicycling, canoeing, and golfing. Approximately one percent of the watershed is in public ownership. Therefore, many of these activities occur on private lands. Although outstanding fishery resources exist throughout the watershed, public access to streams is inconsistent and largely restricted to the upper portions of the watershed. Among the primary outdoor recreational facilities are the Butler Freeport Trail, Harrison Hills County Park, three State Game Lands, and the Buffalo Creek delayed harvest artificial lure only (DHALO) area maintained by the Arrowhead Chapter of Trout Unlimited. Preserves operated by ASWP and the Armstrong County Conservancy also provide important hiking opportunities. There are no formally designated greenways in the watershed at present. Buffalo and Clinton Townships are currently preparing a Joint Greenway Plan for their communities.

The approximately 21-mile section of Buffalo Creek between Worthington and Freeport is a notable canoeing resource. However, except for road crossings there are no public access points on Buffalo Creek, with the exception of the PFBC launch at Freeport near the mouth of the stream.

The watershed has a rich and varied history. Various portions of the watershed were notable in regional settlement, industrial and railroad development, and the origination of the oil industry. A comprehensive survey of historical sites or structures in the watershed does not appear to presently exist. Currently, only two of many potentially eligible sites are listed on the National Register of Historic Places. Three museum facilities are devoted to preservation and interpretation of historic resources in the watershed.

## **Issues and Concerns**

Issues and concerns were identified through the implementation of an extensive coordination effort. This included public meetings, distribution of surveys, participation in community events, meetings with organizations and individuals, coordination and meetings with municipalities, coordination with regulatory agencies, and information exchange via the Project's website.

The rural and small town atmosphere that typifies the area, with its abundance of greenspace and natural beauty, was seen as the most important aspect contributing to quality of life in the watershed. The natural landscapes and ecological communities present here are important components of daily life to watershed residents.

Foremost among the concerns raised was a common theme of the need to retain the rural character and natural landscapes that define quality of life in the watershed. Some of the challenges that face the watershed include water quality degradation from agricultural runoff and malfunctioning septic systems, limited public recreational access and opportunities, greenspace preservation, loss of agricultural land, invasive species, need for historic preservation, and a perceived lack of planning. Many stakeholders expressed frustration at a lack of information and coordination among municipalities, organizations, and interested individuals in the watershed. While there are numerous

initiatives and opportunities being pursued by these various interests, there is no centralized source of information or advocate for the watershed as a whole.

A number of stakeholders also noted that the watershed is increasingly gaining recognition as a regional destination for its recreational opportunities, rural landscape, and small-town atmosphere. This attention could result in substantial economic benefit to local communities. However, this issue is currently not addressed in a comprehensive manner and as a result opportunities are being lost.

### **Action Plan**

Based upon the public input obtained through the planning process, an action plan was developed for activities recommended to address issues, concerns, and opportunities. Action items were identified based upon the problems, their respective potential, and the interest expressed by the community. The primary objectives for the Action Plan for the Buffalo Creek Watershed can be organized according to the following major themes:

- Retain the rural landscape and small-town sense of community that typifies the watershed and attracts people to the area.
- Conserve, restore and protect the biological communities present in the watershed, with particular emphasis on stream ecosystems, the regionally significant forest associations, and reducing potential impact from exotic invasive species introductions.
- Enhance the regionally significant recreational resources in the watershed in order to provide for increased quality of life for residents as well as to provide increased economic opportunities through tourism, and to encourage all to develop a sense of stewardship.
- Create a sense of community stewardship. Encourage and enable residents and local governments to take active and proactive roles pertaining to natural resources, landscape, aesthetics, biodiversity, and other resources that affect their quality of life.

Within these themes, various action items have been developed to meet the goals to restore, maintain, and enhance, as appropriate. For each action item, potential partners in implementing the recommendation are suggested, potential sources of funding are identified, and a priority level is recommended.

Potential partners were identified through the public coordination process, review of organizations present in the watershed with interests consistent with the action plan item, and based upon regulatory provisions or requirements for municipal participation. These partnerships are merely suggestions and do not represent a commitment by any party to participate. In fact, it is quite possible that many items may be implemented by individuals and groups not identified in this plan document. It is the intent of this plan to serve as an invitation for all to become involved, and to assume active roles in implementing recommendations of individual interest.

The implementation of these themes must be consistent with landowner preferences and private property rights. Almost all of the watershed is in private ownership. Many initiatives will depend on private landowners for success. It is also the

responsibility of governments to take an active and proactive role to achieve the goals of this plan. It is essential for governments to assume leadership where needed and appropriate.

Formation of an active, functioning watershed coalition is viewed as one of the critical priorities for the implementation of this watershed conservation plan. This coalition is urgently needed to lead or coordinate many of the items included in this action plan. Efforts to organize such a coalition began in September 2007 as an outgrowth of this plan.

It is to be expected that priorities and opportunities will change over time in response to environmental and social conditions. Therefore, this plan must continue to evolve. Therefore, it is intended that the plan be updated periodically.



Hesselgesser Run