



## Executive Summary

**T**he State of West Virginia is blessed with great natural beauty and a rugged landscape that enticed the explorer, the pioneer, and the settler to travel through and settle within its majestic countryside. Prior to the advent of modern earth-moving equipment and construction technology, streams and rivers and their narrow floodplains defined the pathways and wagon trails throughout West Virginia. With the exception of recent interstate highways that crisscross numerous watersheds within the State, most U.S. and State highways and Class I railroads extend the length of every major river valley in the State. The historic use of the State's rivers for commercial navigation further reinforced this floodplain-centered transportation system.

Early villages and towns sprang up at the confluence of streams and rivers to take advantage of those transportation opportunities and the nutrient-rich floodplain. Unknowingly, these early settlers initiated patterns of movement and development that would place countless thousands of West Virginians in harms way. As abundant natural resources were discovered and exploited, the economic fortunes of the State improved and floodplain communities increased in size and density to accommodate the inflow of new workers and their families. Thousands of acres of forestland were cleared for resource development. The newly constructed railroads and massive resource processing facilities further crowded the floodplains. Excess runoff generated by the combination of expanding communities and resources development quickly overwhelmed the channel capacity of the resident streams and rivers leading to flooding, losses of life and property damages.

Historically, flooding has affected each of the 32 major watersheds and 55 counties within the State. Federally declared flood disasters are far too common in the Mountain State. Thousands of West Virginians have suffered through damaged homes and businesses, lost loved ones, and deteriorating communities. Addressing a problem of this magnitude and complexity necessitated initiation of a strategic planning process that would be comprehensive in scope, sensitive to the needs of the stakeholders and their environment and well coordinated. The Statewide Flood Protection Plan is a result of that process.

## ***How Did the Statewide Flood Protection Plan Get Started?***

After years of planning and coordinating the development of isolated flood protection projects with various Federal and State agencies, the West Virginia Soil Conservation Agency (since renamed the West Virginia Conservation Agency), took the initiative to chart a new course of flood damage reduction and floodplain management in the State. Encouraged and supported by the Governor's office and legislative leadership, the Conservation Agency presented the need for a comprehensive statewide flood protection plan to Senator Byrd. The Senator responded in 1998 by providing funds to the U.S. Army Corps of Engineers for the joint development of a statewide plan for flood protection with the Conservation Agency. Showing the level of commitment needed for this effort to be successful, the Governor's office and the Legislature responded with funding to match the Federal contribution.

In 1999, the Conservation Agency, the Corps of Engineers and the Natural Resources Conservation Service created a framework for the statewide plan that specified the need for a joint Task Force. A dedicated group that could bring to bear the technical and policy expertise and experience needed to tackle the complex flooding issues in the State.

That Task Force met for the first time in September 2000. Composed of 20 Federal, State, regional and local agencies and quasi-public organizations, the Task Force dedicated staff, data, and other resources to the development of a comprehensive strategic plan that would reduce flood damages and save lives. Representatives from the Governor and Senator Byrd's offices attended the Task Force meetings.

## ***What are the Goals and Objectives of the Statewide Plan?***

The Plan is a vision for the future of West Virginia, spelling out both long-term and short-term goals, strategies and implementation schedules. Patience and dedication will be required to successfully reach the established goals. The plan addresses six specific goals:

**Reduce the unnecessary loss of lives due to flooding.**

**Reduce private and public property damages due to flooding.**

**Develop technical and administrative tools to manage flood loss reduction and floodplain management.**

**Promote technical and legislative tools that will reduce excessive runoff from land-conversion activities**

**Reduce personal and economic loss due to flooding while supporting State economic growth.**

**Protect the State's waterways and floodplain environments.**

Objectives for each of the goals were formulated that would challenge the members of the Task Force and the agency representatives tasked to create the Plan.

## ***How extensive is the flooding problem?***

Floods have been documented in West Virginia since the earliest settlements in the 1800's. More recently, between 1996 and 2004 there have been 16 Federal disaster declarations in the State involving flooding. All 55 counties have been included in at least one of those floods. The total FEMA cost during that time span is more than \$500 million.

Floods also result in a loss of life. Between 1960 and 1996, there were 252 deaths from floods or flash floods in West Virginia – more than any other state except Texas with 619 and California with 258. National statistics indicate that as many as 59% of flooding victims drown in their vehicles.

## ***What Other Issues were raised during the study?***

The task force convened a series of public workshops throughout the State to enlist the help of West Virginians in determining what the flooding problems were and what might be solutions to the problems. Information collected in those meetings helped form the foundation of the planning efforts of the Task Force.

After the meetings were completed, the primary issues were gathered into 12 categories. Those categories are discussed below:

### ***a. Floodplain Management***

The enforcement of floodplain regulations required by the National Floodplain Insurance Program has been sporadic in West Virginia, resulting in unwise development decisions within the State's floodplain.

### ***b. Flood Warnings***

Flood warnings are transmitted in a manner that is not understandable by many people; the warnings are not considered to be reliable and many times are not timely.

### ***d. Floodplain Mapping***

Existing floodplain maps are insufficient to make accurate determinations of flood hazard for new floodplain construction.

### ***c. Flood-Damage Assessment***

Information on potential flood damages in the State is not easily accessible to Federal, State or local agencies or to the public.

### ***e. Building Codes, Permitting and Enforcement***

West Virginia needs to maintain enforcement and updates to the building codes that address floodplain construction and drainage issues that can impact downstream flooding and flood damages. Citizens need information about Federal and State regulatory permit requirements when working in the State's streams.

#### ***f. Environmental Impacts of Flooding***

Construction in the floodways and floodplains can have significant environmental impacts on both the stream ecology and people living in the floodplain. Increasing amounts of stormwater runoff from development in the State's watersheds are destroying stream channels, the aquatic ecosystems and creating flood damages. Placement of materials and structures in the floodplain that become floating debris during floods causes further damages downstream.

#### ***g. Stream Crossings and Access Roads***

Incorrectly designed or constructed metal and concrete box culverts, bridges and other stream crossings may be easily blocked by debris and therefore contribute to local flooding. Regulation of the design, installation and maintenance of culverts and other stream crossings is often inadequate or non-existent.

#### ***h. Dredging***

The public has long perceived that dredging of streams is an acceptable and effective means of reducing the negative effects of floods. The continued costs, actual impacts and marginal effectiveness of dredging streams to reduce the effects of major floods are generally unknown or misunderstood.

#### ***i. Resource Extraction***

Mining, forestry operations, along with other resource extraction industries were frequently perceived as being one of the causative factors in flooding. The Department of Environmental Protection was tasked by the Governor to conduct a study of the impacts of mining and timber harvesting on flooding in two watersheds in southern West Virginia. The conclusions of this study are included in Appendix I.

#### ***j. Stormwater Management***

Excessive uncontrolled and unregulated stormwater runoff volumes create nuisance flooding in many areas of the State and the cumulative effect of these incremental runoff volumes contribute to regional flooding events within the State.

#### ***k. Education***

The knowledge of floodplain management professionals, political leaders and the public is inadequate regarding the causes of flooding, methods of reducing flood damages and floodplain ordinances.

#### ***l. Existing Flood-Prone Structures and Facilities***

A substantial number of structures and facilities were constructed within the designated 100-year frequency floodplain in West Virginia prior to existence of the National Flood Insurance Program and many remain subject to annual flood damages.

#### **Are there existing programs in Federal and State government that offer solutions to these problems?**

The short answer is: yes. During the creation of the Plan, Task Force members brought a host of Federal, State, and local flood protection programs to the table. Several flood protection projects had been constructed through those programs. Many of these programs provide viable solutions

to flood damages and other issues, but they require support from local governments, they require investments of capital funds and dedicated maintenance for the life of the project. Many more projects proposed through those programs had never left the pages of the reports that spoke of their positive attributes. For lack of support, funds or justification many of those projects remained only words, drawings and numbers.

### **What are the recommendations of the Statewide Plan?**

After analysis of the basic flooding problem, consideration of the issues raised by citizens of West Virginia, and application of existing flood protection programs and the experience of the Task Force members, the following recommendations were developed.

#### ***a. Floodplain Management***

Increase resources in the West Virginia Office of Emergency Services to support local floodplain managers statewide. Require owners of all new structures to obtain a permit certifying whether or not the structures are in the floodplain. Improve enforcement of floodplain management ordinances.

#### ***b. Flood Warning System***

Improve and expand the network of existing rain and stream gages in the State and connect those instruments to a proposed statewide flood warning system. This system would enable the National Weather Service to issue credible and reliable flood warnings. Provide markers along roads and at stream crossings subject to frequent inundation warning motorists of possible hazards at these locations.

#### ***c. Floodplain Mapping***

Update floodplain mapping to more precisely delineate floodplain areas and create more detailed hydrographic networks to improve flow models and flood risk assessment.

#### ***d. Flood Damage Assessment***

Designate a single agency or point of contact where flood damage data from Federal and State resources could be stored. Develop a system that integrates the capability of Geographic Information Systems (GIS) with flood damage data so that damage information could be used as the basis for flood protection planning.

#### ***e. Building Codes, Permitting and Enforcement***

Continue to support and adopt updates of International Building Code, which covers residential building, plumbing, mechanical, fuel-gas and private sewage disposal requirements and meets minimal flood-resistant design standards. Provide education and technical assistance to the public on the regulatory permit process.

#### ***f. Environmental Impacts of Flooding***

Enact legislation that recognizes the attributes and hazards of the State's floodplains and the needs for stricter enforcement of floodplain ordinances. The legislation should declare floodway zones to be off-limits to new development (with some exceptions), and encourage Federal agencies to evaluate all proposed projects for effects on the State's floodplains. Legislate stricter enforcement of regulations for anchoring floatable materials and structures in the floodway and

flood fringe. Convene a “Stream Summit” to formulate a standard classification of stream quality in the State. Enact legislation that supports local regulation of stormwater runoff volume. Enact guidelines for the emergency removal of stream debris to avoid long-term environmental damage. Fund studies for identification of stable stream reaches that require protection from development.

***g. Stream Crossings and Access Roads***

Establish guidelines for the sizing, installation and maintenance of culverts, drainage structures and stream or river crossings. Identify ownership of abandoned stream crossings and move to demolish unused crossings.

***h. Dredging***

The practice of local stream dredging to reduce the damages associated with large regional floods should be terminated. Channel modifications projects (which includes some dredging) where economically justified and environmentally sound should be supported to reduce flood damages. Allocate funds for stream restoration projects that can reduce flood damages and return the natural functions of damaged streams and ecosystems.

***i. Resource Extraction***

The Task Force supports the recommendations of the study conducted by WVDEP regarding mining. In addition, the Task Force recommends the WV Division of Forestry accelerate revisions to Best Management Practices to reduce the impacts of forestry operations on flooding and develop BMPs on areas severely burned by wildfire.

***j. Stormwater Management***

The Task Force recommends that all counties implement a stormwater ordinance to control the quantity and quality of stormwater and to guide the development and implementation of a stormwater management plan. It is recommended that a State agency inspect stormwater facilities and serve as a back up for local inspection and enforcement of regulations on design, installation, operation and maintenance of these facilities. It is also recommended that special stormwater regulations be prepared for karst areas in West Virginia.

***k. Education***

Encourage State, county and local officials to take the Federal Emergency Management Agency independent study course related to flooding, flood mitigation and floodplain management. Encourage education outlets to develop classes and curriculums that address floodplain and flood issues. Provide visible markers to identify for the public the Base Flood Elevation level.

***l. Existing Flood-Prone Structures and Facilities***

Evaluate the major watersheds in the State to identify opportunities to construct upstream retention facilities for flood control and water supply. Evaluate the existing municipalities in the State to identify opportunities for protection in place of those communities serving as the economic and political centers of their respective counties. Establish a voluntary program of permanent acquisition for structures within the designated floodways and a voluntary program of floodproofing and relocations to address existing structures in the flood fringe areas.

***When can these solutions be implemented?***

The Statewide Plan includes a number of recommendations that are not specified in this abbreviated executive summary. A complete list of the recommendations can be found in Chapter 6 of the Plan. Many of the recommendations listed above would require administrative or legislative actions by the State, county or municipal governments. There are several recommendations for capital construction that would require annual allocation of matching funds by the Federal government and the State through existing flood protection programs. The Task Force purposefully avoided recommending creation of entirely new flood protection programs that could require months of Congressional and Legislature debate at the expense of those in need.

Recommended changes in the State Code could be accomplished annually through the State Legislature. Modifications to county and municipal ordinances could be accomplished through County Commissions and Town/City Councils with required readings and public meetings.

Among the capital construction recommendations requiring allocation of matching funds is the installation of a statewide flood warning system. Given the existence of standing Federal authorities and funding for small flood protection projects, this system could be initiated as early as the fall of 2005. Several recommendations may require the addition to or restructuring of staff in State agencies. These staff proposals would require approval by the Governor and the Legislature along with funding to support the additional positions.

Fully implementing the capital construction and program recommendations included in this plan could cost hundreds of millions of dollars. Some of those required funds could be allocated through existing Federal programs for flood protection, but certain matching funds will need to be budgeted through the State Legislature. Fortunately, the flood-damage reduction benefits that will be generated as a result of those expenditures are cumulative in nature. Therefore, a sustained, modest annual program of expenditures well within the budget capabilities of the Federal and State governments would be effective in reducing losses of life and flood damages.

Allocation of public funds to reduce losses of life and property damages associated with annual floods must certainly be accomplished with consideration of other pressing State and national needs. National security, economic growth and employment opportunities, employment security, education, nutrition, environment, transportation, housing, and many other issues face both the Congress and the State Legislature. Allocating funds and resources to address these various issues in a responsible manner must be accomplished with a reasonable promise of some positive outcome or benefit. The recommendations outlined in this Statewide Flood Protection Plan will each yield positive benefits in reducing the reality and threat of future losses of life and property damages associated with flooding.