



6. Recommendations

The specific issues and findings that relate to these recommendations can be found in Chapter 2 of the report. More detailed discussion of these topics and recommendations can be found in the accompanying appendices. Although many of the recommendations can be implemented through Federal and State agencies' programs, the realization of this Plan will be through the dedicated work of the counties, municipalities, watershed associations and floodplain residents. Without their support, this Plan will not be successful. The recommendations are numbered for identification purposes only and does not suggest or imply a priority of actions.

a. Floodplain Management. The Task Force recommends the following actions:

1. The Task Force recommends that the WV Insurance Commission require all insurance agents selling property insurance in West Virginia either offer flood insurance or maintain a referral list of agents who do offer flood insurance in their community. One such referral mechanism is the LEADS program operated by FEMA. By calling a toll-free number (1-800-720-1093) the caller can obtain contact information for three agents offering flood insurance in any given zip code area.

2. In addition, the Task Force recommends that the Insurance Commission address this problem by requiring all insurance agents to:

- a. Obtain a signature on a statement that acknowledges that the purchaser is aware that flood insurance is not included with their standard policy; and,
- b. Obtain a separate signature stating that the client has declined purchase of a separate policy to cover flood damages if they decline to purchase such a policy.

3. Increase staff in West Virginia's Office of Emergency Services to support local floodplain managers statewide. Adequate support to the 55 counties and 248 municipalities requires additional human resources.

This increase in staff would include:

- a. A staff member to handle training and education of State agencies and regional floodplain technical specialists,

- b. A staff member to handle disbursement of grant funds and to coordinate regional meetings of floodplain managers that will focus on training and peer support for county and local floodplain managers,
 - c. Staff members to provide technical support to local government units and State agency projects throughout the State.
4. Allocate one million dollars annually as the “Flood Loss Reduction Fund.” This fund would provide:
 - a. Non-Federal cost share to match Federal funds for flood damage reduction projects (structural or non-structural).
 - b. Stand alone funds for State initiated flood damage reduction projects.
 - c. Grants to improve local floodplain management.
5. FEMA and WVOES should meet FEMA’s stated goal of conducting a Community Assistance Visit in every community once every 5 years to ensure that the floodplain ordinances are being properly implemented and enforced. This would require them to conduct approximately 72 Community Assistance Visits each year in West Virginia.
6. The State should provide monetary incentives to encourage communities to participate in FEMA’s Community Rating System (CRS) program.
<http://www.fema.gov/nfip/crs.htm> The State should further promote the CRS by coordinating activities too extensive for every community to do on their own.
7. Require all participating communities to adopt and enforce improved floodplain ordinances or to enter into enforcement compacts with adjacent local governments. It is also recommended that cities be required to adopt surrounding floodplain maps at some stage in the annexation process.
8. Require all new floodplain ordinances to prohibit storage of floatable materials in the floodway and establish a program to identify and either remove, stabilize, or anchor floatable structures and materials in the floodplain.
9. Require all propane and fuel-oil dealers to ensure that all LPG and propane tanks over 30 pounds in size and all fuel-oil tanks located within the regulated floodplain or within 50 feet of a perennial stream to be anchored to a fixed structure to resist expected flood waters and impact from debris.
10. To improve enforcement of floodplain management ordinances by requiring every county and municipality to file their floodplain ordinance with the West Virginia Office of Emergency Services within 30 days of enactment.
11. Require that all participating communities have a certified floodplain manager (CFM) on staff or on retainer by 2008. Where fiscal restraints limit a county or municipal government from complying with this requirement, counties and municipalities should enter into cooperative agreements that allow sharing the costs for a regional floodplain manager.

12. All relevant Federal and State agencies should assist in the establishment of a West Virginia Floodplain Management Association in coordination with the Association of State Floodplain Managers, Inc. (ASFPM). The State should encourage participation and membership in the Association of State Floodplain Managers by paying membership dues for one floodplain manager in each county.

13. Require Real Estate Agents to determine location of structures by latitude and longitude, city-style street address, or Tax Parcel number and whether the structure is within the regulated floodplain before the structure is listed for sale. The agent must notify potential purchasers of the location and whether the structure is within the regulated floodplain prior to execution of a purchase agreement.



Figure 6-1. Inadequately Secured Manufactured Home Following A Flood

14. Require that all structure renovation valued at \$10,000 or more, and all new structures obtain a permit document from the appropriate city or county floodplain manager legally certifying whether their site is in or out of the floodplain. All permits identifying sites as being in or out of the floodplain should allow for on site inspection of construction activities. Construction, installation, or renovation of a structure within the floodplain without a permit would be punishable by a fine of not less than \$5,000 and removal of the structure. A copy of this permit must be provided to the utility company before the utility is connected. All utility companies must receive and keep a copy of the approved permit prior to connecting utility. Should no permit be obtained prior to construction, the builder, homeowner, utility company, and property owner shall be held liable. Where local communities have adopted combined building code and floodplain ordinance enforcement and permitting, the local code enforcement office may provide such certification if he or she holds the CFM designation and appropriate CABO and/or ICBO certification through the local permitting processes.

15. Require that the builder, homeowner, mobile-home installer, or property owner provide a copy of a certification signed and sealed by a WV Registered Professional Engineer, confirming that the manufactured home is properly installed (including anchoring) to the utility company before the utility is connected. Require all utility companies to receive and keep a copy of this certification. If a certification is unavailable, the manufactured home must be inspected and a certificate signed and sealed by a WV Registered Professional Engineer. This document confirms that the manufactured home has been properly installed before any utility can be connected.

16. The Task Force recommends that a program be established to identify “gap” structures, (structures that affect the flow characteristics of a stream, such as bridges, retaining walls, culverts etc., constructed during the gap between the time the watershed was studied and the Flood Insurance Rate Map (FIRM) was published) and report them to WVOES so the appropriate watersheds can be moved to a higher priority for restudy.

17. Require all surveyors and professional engineers to include the floodplain boundaries, when applicable, as delineated on the FIRM on registered plat maps with the latitude, longitude, and elevation of a reference point.

18. The Governor should issue an Executive Order and the Legislature should issue a resolution that supports floodplain management and recognizes the natural and beneficial role of the floodplain in providing ecological and economic benefits to the State.

19. Discourage development within the floodplain through:

- a. Relocation assistance to property owners in the floodway.
- b. Floodplain ordinances to forbid future development in floodways.
- c. Legislation to prohibit installation of new infrastructure in floodway unless there is no other alternative.

20. Deny all financial assistance to local governments and public institutions that construct new buildings or enter into new leases in buildings located in the regulated floodplain.

21. If a regional or State agency is providing floodplain management assistance to a local government, that local government must consult with the regional or State agency providing assistance on all proposed variances from the floodplain ordinances.

22. Require all new public structures or significant improvements to existing public structures within the regulated floodplain to be constructed in a flood-resistant manner.

23. Initiate a program to relocate all critical facilities, such as government administration buildings, hospitals, jails, and water and sewer treatment plants out of the floodway.

24. Require all State agencies to prepare a 10-year plan to eliminate, relocate or renovate structures and facilities within the regulated floodplain that are not constructed in a flood resistant manner.

25. The Task Force also recommends that the appropriate state agencies develop location standards that prohibit locating floatable materials within the regulated floodplain at the following types of facilities:

- a. Solid Waste non-disposal facilities,
- b. Solid Waste disposal facilities,
- c. Hazardous Waste treatment, storage and disposal facilities,
- d. Natural Gas facilities, and
- e. Underground storage tank facilities.

26. Enable the WV Public Land Corporation through legislative enactment and increased staffing to enforce current permitting requirements for in-stream construction or channel alteration.

27. Enable the WV Public Land Corporation to develop and enforce a legal contract requiring permit applicants to agree to maintain a specified minimum hydraulic carrying capacity of the structure being installed.

28. The Task Force recommends that guidelines for the disposal of removed stream obstructions and debris be developed through a joint effort of the Federal and State agencies on the Task Force.

29. The Task Force recommends a consistent policy be established for addressing the following issues:

- a. Areas outside the State's boundaries that affect flooding events within West Virginia.
- b. Islands with residences or industry located entirely within the floodplain.
- c. County seats located within the floodway.
- d. Recreational areas in floodplain.
- e. Ponds and dams removed or altered and the subsequent planned or inadvertent reduction of flood protection.

30. The Task Force recommends that every county identify and prepare relocation areas for use in the event of a disaster. These areas should be provided with water and sewage service. In the interim, these areas should be developed as parks, athletic fields or similar recreational use.

31. Amend § 7-1-3 of the West Virginia State Code as follows:

- a. Not restrict local governments to the minimum floodplain standards established in the NFIP

- b. To require all new development to obtain a permit at least to the floodplain determination stage. This permit process would require the developer to obtain documents delineating the site location relative to the floodplain.
- c. To mandate that communities must have language in their floodplain management ordinance that requires a buffer zone equal to twice the width of the stream from the top of the bank of all perennial streams **without a delineated floodway**.

b. Flood Warning System. The Task Force recommends the following actions :

1. Improve the flood warning system in incremental steps over a 5-year period by:
 - a. Adding ALERT and GOES transmission equipment at 118 stream gages.
 - b. Install an additional 60 rain gages,
 - c. Install an additional 28 stream gages with ALERT and GOES communications,
 - d. Install an additional 9 radio repeaters for the ALERT communication system.

These improvements would require \$2,183,000 capital expenditure for the new equipment and installation.

2. It is also recommended that all gages be provided with modern communications equipment to reduce the lag time in reporting to one hour or less. This would cost an estimated \$656,800 over the next five years in addition to the \$2,183,000 itemized above. It is recommended that every gage have two methods of communicating the data collected to the inquiring parties.

3. Provide adequate funds and staffing for the West Virginia Office of Emergency Services to ensure adequate operations and maintenance of the expanded IFLOWS gages and system.

4. Improve the dissemination of flood warnings and other disaster warnings by mandating the rebroadcast of warnings on all fire, police, and emergency medical-service frequencies. Individuals and businesses with radio scanners will receive these warnings in a more timely and reliable fashion.

5. In an effort to reduce vandalism of rain gages it is recommended that priority be given to locating rain gages with cellular telephone towers where possible. It would also be possible to establish communications with these gages via the cellular telephone network to eliminate the dependence upon land lines for communication.

6. Improve the flood warning system by providing each county warning point one computer and the appropriate software dedicated to the Storm Watch Program. This can

be accomplished over a 3-year period through Federal grants from the National Weather Service.

7. Encourage local communities to participate in the StormReady program conducted by the National Weather Service.

8. Improve the maintenance of historical data by providing funding for archiving of data from rain and stream gages on a statewide level.

9. Improve the flood warning system by installing three Specific Area Message Encoding (S.A.M.E.) radio transmitters to broadcast disaster warnings throughout the State. This would cost approximately \$90,000 for the transmitters. This will assist local communities in participating in StormReady. This technology (S.A.M.E.) can also be used to disseminate information on hazardous-materials (HAZMAT) incidents, terrorist activities, and other disasters.

10. Improve dissemination of disaster warnings by requiring all public facilities receiving State funds to purchase and use S.A.M.E. receivers to receive warnings of disasters that apply to their local area. These receivers cost between \$40 and \$90 each. This will assist local communities in participating in StormReady.

11. Improve dissemination of disaster warnings by encouraging the public to purchase and use S.A.M.E. receivers to receive warnings of disasters that apply to their local area. These receivers cost between \$40 and \$90 each.

12. That the WV Department of Environmental Protection, Division of Water and Waste Management Dam Safety Program be provided additional staff, resources and funding from the general fund specifically targeted to provide improved capability for Monitoring and Emergency Action Plans (EAP) technical review, approval and exercise. Improve the dam-related EAPs through public education and enhanced capability to review new and updated plans in coordination with local emergency services offices. Perform tabletop and field exercises of existing EAPs.

13. It is recommended that the Department of Transportation be funded to design and install signage similar to the “Bridge Freezes Before Road” sign to identify State highways that are frequently blocked by high water.

14. It is recommended that the WV Office of Emergency Services establish procedures for the review and updating of existing county emergency evacuation plans related to flooding.

c. Floodplain Mapping. The Task Force recommends the following actions:

1. Encourage FEMA and dedicate sufficient funds to re-map all watersheds in the State using a modern suite of mapping technology that will:

- a. Create enhanced elevation and terrain data, as well as more detailed hydrographic networks to improve flow models and flood risk assessment.
- b. Accurately identify the channel shape.
- c. Eliminate all “Approximate A” zones by conducting detailed studies to delineate more accurate and realistic flood-prone areas.
- d. Delineate floodplains in previously unmapped areas.
- e. Upgrade the quality of floodplain maps statewide with priority given to heavily populated floodplain areas, areas of repetitive losses, areas with high levels of flood damages and areas with insufficient mapping as identified by the Map Needs Update Support System (MNUSS).

2. The Task Force recommends that West Virginia initiate a program to develop DFIRMs for all counties to replace the Q3 and paper maps for use in planning and regulation.

3. The Task Force recommends that West Virginia initiate a program to provide hardware, software and training in the use of Geographic Information Systems (GIS) and DFIRMs to all West Virginia jurisdictions in the National Flood Insurance Program.

4. That FEMA provide funds for the Corps of Engineers to populate the MNUSS database as has occurred in other states such as Virginia and Pennsylvania.

5. The Task Force further recommends that WVOES be provided the staff and resources to coordinate maintenance of floodplain maps in West Virginia.

6. All State and Federal agencies should adopt current FEMA guidelines for floodplain mapping, in defined project areas, that is consistent with the Federal Emergency Management Agency’s document “Draft Guidelines and Specifications for Flood Hazard Mapping Partners.”

7. Appropriate state agencies, local governmental units and Regional Planning and Development councils should assist in the mapping process by becoming Cooperating Technical Partners (CTP) in Flood Hazard Mapping.

8. Fund Regional Planning Councils (RPC’s) or Economic Development Authorities (EDA’s) to re-evaluate flood hazards in non-participating communities. Many communities were not originally mapped under the NFIP due to a lack of growth potential or low frequencies of flooding. Many of these same communities are now confronted with development issues in their floodplains through new growth or annexations of county development. The RPC’s or EDA’s could assist any non-participating community interested in joining the NFIP. This item has been completed since initiation of the Task Force study.

9. All hydraulic studies conducted by or through Federal and State agencies within the State for the purposes of identifying, enhancing or developing floodplain areas should be required to delineate a floodway zone (in accordance with procedures used in the NFIP) with the study.

10. The Task Force recommends that State agencies, local governmental units and Regional Planning and Development councils assist in the mapping process by becoming

Cooperating Technical Partners (CTP) in Flood Hazard Mapping. The Task Force also recommends that West Virginia investigate the possibility of becoming a Cooperating Technical State with FEMA in developing new flood studies and new DFIRMs.

11. Delineate inundation areas resulting from sunny-day and heavy rainfall dam failures on Flood Insurance Rate Maps and other floodplain maps as appropriate for planning purposes.

12. Promote the collection of accurate latitude, longitude, and elevation data on all repetitive-loss sites, flood control facilities, and significant flood damage sites.

13. Initiate a new “off-budget” State instrumentality (such as the West Virginia State Mapping Board) to develop and maintain digital mapping statewide for flood and other disaster planning. The program should be implemented and operated in cooperation with Federal partners (FEMA, USGS, USACE, and EPA) and State agencies with hydrologic-mapping expertise or regulatory responsibilities.

d. Flood Damage Assessment. The Task Force recommends the following actions:

1. Designate a single agency within State government as a point of contact or clearinghouse where a flood data repository could be established. This agency would be mandated to manage all flood data including an inventory of at-risk structures, repetitive-loss data, flood control project data, and other databases. This data should include information on losses sustained by residences, businesses, farms/agricultural losses, roadways, railroads, and other types of losses. WVOES would be the appropriate place for such a database assuming that adequate staffing and funding could be provided. The Watershed Resource Center, or any of the many universities or colleges in the State are alternative locations for a repository.

2. Develop flood and flood damage data with latitude, longitude, and elevation data so that both counties and watersheds can be used as the geographic basis for planning.

3. Update existing damage assessment data for 11-digit Hydrologic Unit Catalog (HUC) code watersheds for use as a planning tool. The U. S. Army Corps of Engineers and the Natural Resources Conservation Service should collaborate to develop flood damage data along all rivers within the State. Individually authorized protection projects will still have to develop damage estimates for their own cost-benefit analyses. Copies of this project specific data will be provided to the clearinghouse discussed above.

4. Encourage local jurisdictions to obtain the repetitive-loss data from WVOES and determine latitude, longitude, and elevation figures for each repetitive-loss structure in their jurisdiction so this data can be included in a GIS database for use by local, State, and Federal agencies.

5. Develop a chart that identifies specific Federal and State offices where flooding information or assistance may be obtained. This chart should be available in printed and web-based versions.

6. Conduct a study of the expected mortality from flooding at different recurrence levels.

7. Appropriate the necessary funds to the West Virginia State Medical Examiner's Office to purchase, equip and staff a portable morgue for use in mass casualty disasters.

e. Building Codes, Permitting and Enforcement. The Task Force recommends the following actions:

1. The Task Force recommends that the State should adopt all six separate sections of the "2000 International Building Code" for use in the regulated floodplain. Developed by the International Code Council in 1999, this updated code covers residential building, plumbing, mechanical, fuel-gas, and private sewage-disposal requirements and meets minimum flood-resistant design standards of the NFIP. This code would replace the existing Building Officials and Code Administrators (BOCA) and the Council Of American Building Officials (CABO) codes included by reference in 87CSR4 (State Building Code).

2. The State should mandate that all counties adopt and enforce the international codes within 5 years after legislative adoption. At a minimum these codes should apply to new construction within the floodplain and to significant improvements to existing structures within the floodplain.

3. The West Virginia Development Office should prepare and disseminate to counties and municipalities a model sub-division regulation that contains a requirement that every residential, commercial or industrial lot include a portion of developable land that is out of the floodway for construction of a structure.

4. The State should expand the Division of Labor's Manufactured Housing Section enforcement unit to a total of 11 field enforcement people with appropriate supervisory and support staff. An alternative recommendation would be to eliminate the Manufactured Housing Section and combine it with the new Building Codes Division.

5. The Department of Labor should require all appropriate staff to become conversant with floodplain management issues and incorporate the use of Flood Insurance Rate Maps in inspection procedures.

6. That the appropriate Corps of Engineer District offices and State offices involved in the issuance of regulatory permits in West Virginia waters develop and deploy a public information and awareness program for local officials and private landowners.

f. Environmental Impacts of Flooding. The Task Force recommends the following actions:

1. That the Governor's Office issue an Executive Order recognizing the beneficial attributes of the State's floodplains. That order also should declare the designated floodway zones within the State to be off-limits to development unless the local floodplain jurisdiction receives documentation from a WV Registered Professional Engineer showing that such development will not increase the Base Flood Elevation and has been designed and will be constructed to an engineering standard that will sustain the water depths and velocities associated with the floodway location. That order also should encourage Federal agencies operating in West Virginia to evaluate all proposed or financially subsidized projects in accordance with Federal Executive Order 11988.

2. The Task Force recommends that State legislation be enacted that will empower local floodplain management officials to prohibit placement or storage of floatable material within floodways that does not include suitable anchoring. Administration and enforcement of these regulations would be through county and municipal floodplain managers using the enforcement powers contained in the floodplain management ordinances.

3. That a "Stream Summit" be convened in 2005. The purpose of this summit would be to coordinate the various stream quality designation programs used by the Federal and State agencies working in the State. Many of the anticipated participating agencies are current members of the Task Force that identified a range of definitions of "stream quality" during the preparation of the Statewide Plan. The long-term goal of the summit and subsequent meetings would be to agree on a standard classification of stream quality in the State that could guide future planning and project development.

4. That a study be conducted to identify, document and preserve stable streams. This study would be a collaborative effort between WVDEP, WVDNR, WVCA, NRCS and USACE. The results of the study would provide a foundation for legislative statewide protection of stable streams. Although the existence of stream channel stability does not lessen the potential for over-bank flooding, stable streams are capable of accommodating high flows without excessive erosion or bank displacement. Such streams provide a base condition for future stream rehabilitation and restoration activities in each region of the State.

5. That a "Wetlands Summit" be convened in 2005. The purposes of this summit would be to: (1) identify those Federal, State, regional and local agencies having a mission or purpose to identify, protect and restore riverine-related wetlands, (2) assess the relative condition of the State's riverine wetlands including threats to existing wetlands, (3) identify those areas within the State where riverine wetlands restoration or creation would be most effective (such as, non-productive agricultural lands within the floodplains, abandoned mine lands or abandoned industrial lands, conservation easements set aside for wetland development), and (4) identify potential sources of funding for wetlands protection and restoration.

7. That State guidelines for emergency removal of stream debris be developed that would guide emergency response agencies and contractors during these removal operations. Such guidelines could be developed through a collaborative effort of the Task Force member agencies. These guidelines would ensure that in-stream debris removal

following a flood event would not result in excessive, long-term environmental damage to the stream or river affected. The guidelines would increase awareness of the need for permits for in-stream work and ensure that debris disposal does not further inhibit floodwaters. Included within these guidelines would be information on the location of stable streams and high quality streams (when available) and a series of best management practices to guide response agencies and their contractors.

g. Stream Crossings and Access Roads. The Task Force recommends the following actions:

1. That voluntary guidelines or Best Management Practices (BMP) for the sizing, installation, and maintenance of culverts, drainage structures and stream/river crossings be developed by the Task Force. Municipalities and individuals installing stream crossings should install one with a diameter or cross section at least as large as the closest appropriate downstream Division of Highways crossing unless an alternative size is provided by a professional engineering study that would ensure that these facilities would carry the stream capacity during a 10-year storm event without contributing to flood damages.



Figure 6-2. Roadway under Interstate 77 blocked by high water during a major flood event

2. That guidelines or BMPs for installation and maintenance of stream crossings for the 10-year storm event without causing additional upstream flooding be developed and enforced. Appropriate sizing for culverts and bridge openings must consider the potential for future development in the watershed. Where such development potential exists, culverts and bridge cross sections should be enlarged to handle anticipated runoff. Establish a program, including a permitting process, within a State agency to control the design, installation, and maintenance of private and public non-highway drainage structures.

3. That the State create a technical assistance program that includes funding and resources for a State agency to provide assistance in the design, installation, and maintenance of public and private stream crossings.

4. That \$100,000 annually be provided to the WV Division of Highways from the general fund for a study of abandoned stream crossings (public or private road or railroad bridges or culverts) to ascertain ownership of said facilities, and provide recommendations for condemnation and removal if deemed necessary to reduce flood damages.

5. That regulations and/or best management practices including minimum criteria for construction and closure or abandonment of access roads be developed and applied consistently to all industries throughout West Virginia.

h. Dredging. The Task Force recommends the following actions:

1. That regulatory permit requests for dredging operations in the State **as a means of reducing flood damages** be approved only where documentation demonstrates that flooding will be mitigated, environmental impacts are not excessive, and where annual maintenance is assured through executed agreements. This should not hinder permitted channel modifications that are designed and maintained to reduce flood elevations of high frequency floods (low level), stream restoration, or restoration of aquatic environments. Nor should this hinder efforts by any Federal or State agency to address major flood events through an authorized and designed channel modification or a snagging and clearing operation where that activity is proven through engineering documentation to be an effective and cost efficient method for reducing flood heights and where annual maintenance is assured through local agreements.

2. That the State provide funding for State stream restoration programs to match existing Federal programs and that regulations for preservation of stable streams be developed through a collaborative effort of the WVDEP, WVCA and WVDNR. Candidate streams for restoration will be identified by the agencies participating in the recommended “Stream Summit”.

3. The Task Force recommends that guidelines for the disposal of removed stream obstructions and debris be developed through a joint effort of the Federal and State agencies on the Task Force.

i. Resource Extraction. The Task Force recommends the following actions:
AGRICULTURE

1. It is recommended that the WV Department of Agriculture, the WV Conservation Agency, and the USDA – Natural Resources Conservation Service review existing BMPs and expand the number of agricultural facilities adhering to them.

FORESTRY OPERATIONS

1. The Task Force recommends that the State Attorney General's office evaluate the current agency authorities to determine which agency(s) has been empowered to regulate the location of sawmills, sawn-log storage areas, load-out areas and consolidation yards within designated regulatory floodway zones. Should no State or county agency currently be so empowered, the Legislature should authorize and fund an appropriate agency to regulate the location of these facilities in the regulatory floodway. Such regulatory authority should be vested in an agency that is not directly involved with harvesting timber resources within the State. Timber harvesting companies and contractors should be required by the regulation to coordinate the location of these temporary timber storage and milling facilities with local municipal or county floodplain managers prior to construction.
2. That the organizational structure of the WV DOF be realigned to prioritize as urgent the inspection of each logging job during and at the end of each operation and deemphasize the need for a reduction in the number and severity of wildfires.
3. That the WV DOF develop BMPs for the restoration of areas that have been severely burned by wildfire to prevent erosion.
4. That the WV DOF and the WV Department of Environmental Protection, Office of Environmental Enforcement determine the need for a Memorandum of Understanding to clearly define each organizations responsibility and improve enforcement efficiency.
5. That the WV DOF improve quality control of inspections by publishing an annual report of logging operations and inspections.
6. That the WV DOF continue to provide training and technical assistance to loggers in regard to BMPs.
7. That the WV DOF establish a toll free message center so loggers can easily and rapidly notify the WV DOF when they are completing a logging operation or are forced to move due to adverse weather, equipment problems and/or any other reason.
8. That the WV DOF prepare educational material on the effects of wildfires and repetitive wildfires on soils and the resulting increase in runoff and flood damages for presentation to high school students, landowners, public officials, floodplain managers and the public.
9. That the WV DOF investigate possibilities for economic uses for slash, logging waste and less desirable wood to prevent logging waste from being left in and along streams.
10. That the WV DOF be provided the resources and authorization to employ additional employees including: Forest Hydrologist, Wildfire Specialists and Foresters to address timber management and field enforcement of BMP's.
11. The Task Force supports continuing development of new regional hydrological models specifically for forested areas by the USFS.

MINES AND QUARRIES

1. That all recommendation of the Flood Advisory Technical Team (FATT) study relating to mines be implemented.

2. That the Department of Environmental Protection develop and enforce regulations which meet the minimum standards detailed in the Stream Crossings And Access Roads appendix of this plan.

OIL AND GAS

1. That the Department of Environmental Protection develop and enforce regulations which meet the minimum standards detailed in the Stream Crossings And Access Roads appendix of this plan.

j. Storm Water Management

1. It is recommended that all counties in West Virginia implement a storm water ordinance to control the quantity and quality of storm water and to guide the development and implementation of a storm water management plan. These local ordinances must be at least as strict as State regulations. Local jurisdictions must provide for enforcement of their own ordinances.

2. It is recommended that a State agency inspect storm water facilities and serve as a back up for local inspection and enforcement of regulations on design, installation, operation and maintenance of these facilities. In the event no suitable State agency is found to provide the technical assistance and enforcement support needed, it is recommended that the regional watershed flood protection authorities based on the eight digit watershed basins be given this responsibility. Details on these groups are provided above.

3. It is recommended that all storm water conveyances (ditches, culverts, piping etc) be sized no smaller than the nearest appropriate downstream Department of Transportation storm water conveyance unless hydraulic/hydrology studies indicate otherwise. It is further recommended that the Department of Transportation be allocated funding to provide technical assistance on determining the appropriate size to persons installing storm water conveyances.

4. It is recommended that any development of greater than 3 acres during any 5-year period must provide storm water management plan that addresses the total run off to the entire catchment.

5. That additional resources in staff and funds be provided to the Division of Forestry to address wildfires. Due to rugged terrain and limited access into some areas, wildfires are a serious threat to the forest resources. These forested lands absorb tremendous quantities of rainfall that would otherwise reach the State's streams and rivers. Forests

devastated by wildfires do not have the capability to absorb rainfall and therefore increased runoff and erosion occurs.

6. It is recommended that any storm water detention facility discharging to a cold-water trout stream be designed to detain water no more than 12 hours. In addition the pond should be designed so that it discharges from the bottom, cooler portion of the pond. Detention facilities discharging into warm water streams should be designed to detain storm water at least 24 hours.

7. It is recommended that the Department of Transportation design signage similar to the “Bridge Freezes Before Road” sign to identify roads that are frequently blocked by storm water.

8. The Task Force recommends that any county with karst topography develop specific ordinances to protect the karst topography and groundwater supply from the effects of excessive stormwater.

k. Education. The Task Fore recommends the following actions:

1. Encourage State, county, and municipal officials involved in floodplain management, community planning, building inspection, emergency services, or enforcement of land use planning to take the Federal Emergency Management Agency Independent Study Courses related to flooding, flood mitigation, and floodplain management.

2. WVOES should present at least one Federal Emergency Management Agency field course specifically addressing flooding each year in West Virginia.

3. WVOES should develop and present at least 1 state-specific workshop each year that is related to flooding in West Virginia. Topics could include:

- a. Local floodplain ordinances
- b. Relevant sections of the West Virginia State Code
- c. Flood Insurance Rate Maps, Digital Flood Insurance Rate Maps, Q3, GIS data and other data sources used to update flood maps
- d. Updating flood maps
- e. Land-use management
- f. Stormwater management
- g. Flood damages
- h. Floodplain management
- i. Floodplain protection
- j. Potential impact of flooding in their region
- k. Factors contributing to flooding (floatable debris in the floodway, constricted floodways, undersized or poorly constructed stream crossings)
- l. Perils of building in the floodplain
- m. Flood proofing
- n. Flood-resistant construction techniques
- o. Reducing flood-insurance premiums

- p. Concepts of stable streams.
- q. Benefit-cost analysis of flood damage reduction
- r. Elevation certificates.
- s. Dam Safety Monitoring and Emergency Action Plans
- t. Natural Stream Restoration and the inter-relationship of stream morphology, land use, channel encroachment, dredging, stormwater/ erosion control, stable streams, and flooding.

4. The Task Force in conjunction with the National Flood Insurance Program Coordinator should develop and conduct an annual conference/seminar on floodplain management in West Virginia for all floodplain managers, public officials, and other interested parties to encourage training and develop peer support. If the West Virginia Floodplain Managers Association becomes a reality, the Association could take over this responsibility.

5. The Insurance Commission should provide incentives for insurance agents to be educated about the National Flood Insurance Program (NFIP). Ten to twenty agents should be randomly checked each year to ensure that they are offering flood insurance to businesses and residents or providing appropriate referrals; and to determine if flood policies are being rated properly.

6. The State should encourage participation in the annual seminars by providing this training at no cost and reimbursing qualifying jurisdictions for a portion of the salary of trained and nationally certified floodplain managers and certified building inspectors. Total reimbursement would be limited to \$10,000 to qualifying jurisdictions for training and permits reimbursement. (The total estimated cost statewide is \$550,000).

7. Encourage participation in floodplain management training activities by providing certification or continuing-education credits for courses and workshops. Attendees should include: (a) State, county, and municipal government, (b) insurance companies, (c) financial institutions, (d) real estate companies, (e) utility companies, (f) watershed associations, (g) professional land surveyors, (h) professional engineers, (i) floodplain managers, (j) public officials, (k) elected officials, (l) building inspectors, (m) community planners, and (n) other interested parties.

8. Encourage educational outlets in West Virginia (Vo-tech, Community Colleges, publicly owned colleges and universities) to develop classes and curriculums that address floodplain and flood issues. Floodplain management and flooding should be addressed during appropriate sessions of the current curriculum.

9. Brochures should be prepared and distributed on flood proofing methods, flood-resistant construction techniques, and strategies for reducing flood-insurance premiums to all National Flood Insurance Program policyholders in WV.

10. A brochure on the values and concepts of protecting stable streams should be prepared and distributed.

11. The Vocational Technical schools should incorporate training on retrofitting floodplain structures and other flood mitigation techniques in all construction-related courses. Individuals receiving such training should be encouraged by counties to work with communities and individuals immediately after a flood event to “build back smarter” and in a sustainable manner.



Figure 6-3. Task Force Flood Display presented at West Virginia State Capitol

12. All surveying classes (college, university, vocational, and high school levels) should include a session on the completion of elevation certificates, their importance in floodplain management, and a general outline of the floodplain permitting process.

13. To provide the public with a readily visible indication of the Base Flood Elevation (BFE) (elevation of the 100-year frequency flood), surveying classes should prepare projects that require students to survey the BFE and indicate this elevation on utility poles and/or street signposts, where practical, within a community. These would be general guides and wouldn't be legal reference points for determining flood-insurance premiums.

14. The WVDOH should establish or reestablish elevation reference marks on all bridges.

15. The Department of Motor Vehicles should identify the dangers of flooded roadways through all high school drivers' education classes and through the license testing process.

16. WVOES should make training in maps and map reading available to all Federal, State, local and volunteer personnel involved in flooding in West Virginia on a regular basis.

I. Strategy To Reduce Damages To Existing Flood Prone Structures And Facilities. The Task Force recommends the following actions:

1. Through a collaborative effort, the USACE and NRCS work jointly with the WVCA and other Task Force member agencies to assess the State's major watersheds. The purpose of this assessment would be to determine whether there are any opportunities to construct additional upstream flood storage/retention facilities in the watersheds that would reduce downstream flood damages, potentially provide a reliable source of potable water for communities within the region and provide improvements in downstream water quality and flow. Several of the watersheds shown on the statewide watershed map (see Figure 1-5) have existing storage facilities (see Appendix L) operating for flood control, low-flow augmentation and water supply. Previous studies conducted for the watersheds by various Federal and State agencies would form the basis for these studies.

This assessment could be funded in part through the USACE Section 22 Planning Assistance to States program for State/regional flood protection studies. Full consideration of the anticipated environmental effects of these potential storage facilities would be coordinated with the WVDNR, WVDEP and USFWS during the assessment. Those potential storage projects generating substantial flood protection benefits would be proposed for more detailed study through existing or new Congressional authorities. More detailed feasibility evaluations would be initiated only after firm commitments from eligible and financially capable non-Federal sponsors.

2. Through a collaborative effort of the USACE and NRCS work jointly with WVCA and other Task Force member agencies to conduct watershed specific assessments that determine whether existing municipalities and major unincorporated commercial/industrial centers within the State need to be protected in place (floodwalls, levees, channel modifications, relocations) to preserve the commercial, service and employment base that now supports the surrounding county population. These protected centers also can serve as relocation sites for commercial and residential development acquired from the floodway (see item 3 below). Existing data from previous protection studies for these communities can form the basis for this assessment. The recommendations of these watershed assessments would form the basis for funding requests to pursue specific protection projects at critical municipal centers.

The watershed assessments may be conducted through programs such as the Section 22 PAS and PL 83-566 Watershed Protection and Flood Prevention Act. Full consideration of the environmental effects of these potential structures would be coordinated with the WVDNR, WVDEP and USFWS during the assessment.

3. A voluntary program of permanent floodway acquisition should be established to address the inventory of existing structures in the regulatory floodway. These structures and their associated facilities are subject to frequent and severe flooding and impact damages by floating debris. During flood events, these structures can become floatable debris blocking stream crossings and battering other downstream floodplain development. These structures can also serve as point sources of stream pollution. The

floodway acquisition program would be initiated in the non-municipal areas to avoid interference with possible structural protection of incorporated cities, towns, villages and communities and commercial centers discussed in item 2 above. The program would be voluntary in nature and relocation benefits and services would be provided to assist families to secure flood-safe replacement housing. Feasible commercial and industrial relocations would be assisted through Federal and State economic development grant and loan programs. Federal, State and local government offices and facilities would be relocated to flood-safe sites.

The Section 202 Nonstructural flood Damage Reduction program, being implemented in the Tug Fork Valley since 1985, has acquired several hundred floodway structures in West Virginia and Kentucky. This action has resulted in an overall reduction in flood damages and a reduction in the 100-year frequency flood profile in project areas. In conjunction with this program, three replacement housing sites were constructed to accommodate relocated families. In some cases, commercial structures were acquired in the floodway relocated within communities protected by local protection projects (floodwalls). WVOES projects administered through FEMA's Hazard Mitigation Grant Program have also successfully acquired floodway structures throughout the State.

The proposed floodway acquisition program could be best administered through FEMA (Pre-Disaster Mitigation Program) in cooperation with WVOES. The WVHDF and WVDO could support this effort through identification and funding of replacement housing and commercial relocation sites. The success of the floodway acquisition program would be partially contingent upon the ability to secure decent, safe and sanitary replacement housing outside of the floodplain. Equally important would be a site development process for commercial relocations from the floodplain.

4. A voluntary program of nonstructural protection should be developed for structures located in the flood fringe areas of the State that cannot be protected by structural floodwalls, upstream retention, or channel modifications. Nonstructural protection would include floodproofing, replacement on-site or permanent acquisition depending upon the height of flooding at the structure, the structure type and building condition and comparative option costs.

The Section 202 Nonstructural flood Damage Reduction program being implemented in the Tug Fork Valley since 1985 has floodproofed several hundred flood fringe structures in West Virginia and Kentucky. This action has resulted in an overall reduction in flood damages and an improvement in housing quality throughout the basin. The proposed program would not be initiated until the assessments in (1) and (2) above are completed and the floodway acquisition program has been initiated in a watershed. This nonstructural program would be best administered through the USACE, NRCS, WVCA and WVOES.