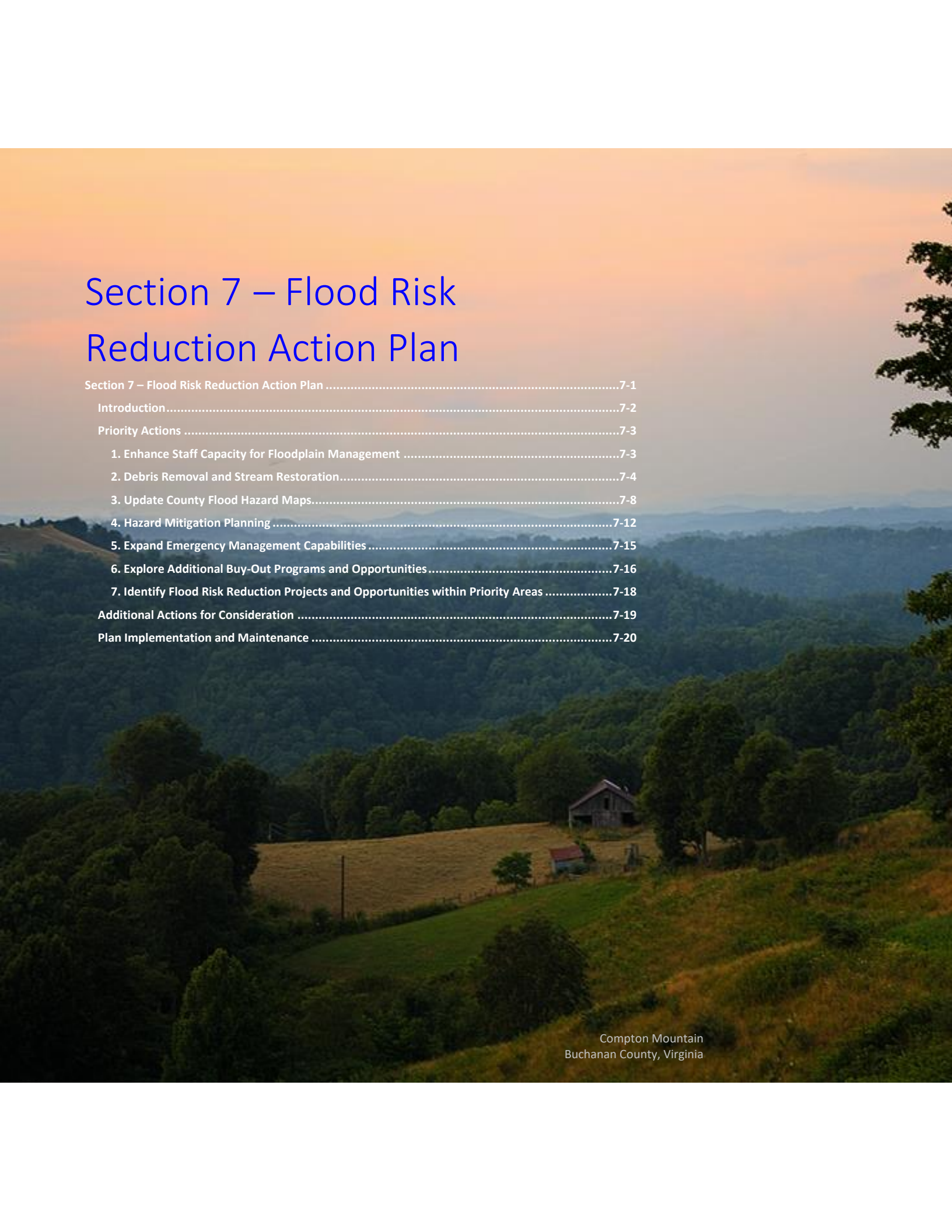




Section 7 – Flood Risk Reduction Action Plan

Section 7 – Flood Risk Reduction Action Plan	7-1
Introduction.....	7-2
Priority Actions	7-3
1. Enhance Staff Capacity for Floodplain Management	7-3
2. Debris Removal and Stream Restoration.....	7-4
3. Update County Flood Hazard Maps.....	7-8
4. Hazard Mitigation Planning	7-12
5. Expand Emergency Management Capabilities	7-15
6. Explore Additional Buy-Out Programs and Opportunities.....	7-16
7. Identify Flood Risk Reduction Projects and Opportunities within Priority Areas	7-18
Additional Actions for Consideration	7-19
Plan Implementation and Maintenance	7-20

Introduction

The purpose of the Flood Risk Reduction Action Plan is to provide Buchanan County with strategies to reduce the impact of flood hazards. It is designed to be targeted, strategic, and functional in nature:

- In being targeted, the action plan focuses on actions the County can take to reduce unique flood risks identified in the plan's risk assessment (Section 6) with consideration to the County's capabilities and capacity (Section 5) and previous or ongoing flood mitigation efforts.
- In being strategic, the action plan ensures that the actions are presented in a logical manner. Actions are designed to build off the capabilities gained by achieving a prior action. This structure aims to minimize potential roadblocks and improve the potential for successful implementation.
- In being functional, each prioritized action, when possible, is broken down into implementable steps. When available, funding sources are identified that may assist in project implementation.

Developing the Flood Risk Reduction Action Plan involves the identification, consideration, and analysis of available flood mitigation measures (i.e., activities, policies, projects, etc.) that will reduce flood risk within Buchanan County. These actions include plans and policies (such as the regulation of land in known hazard areas through a local ordinance), data and studies to enhance understanding of localized flood risks, and flood mitigation projects that seek to address targeted flood risks (such as the acquisition and relocation of structures at high risk to flooding).

The action plan includes seven prioritized actions for flood risk reduction. These actions are identified as those necessary to expand the County's ability to appropriately scope future projects and/or those considered to be highest priority for life safety. **Priority actions are those that should be implemented as soon as possible, with an estimated timeline of 0-3 years, unless otherwise noted.** Priority actions are focused on:

1. Enhance staff capacity for floodplain management;
2. Debris removal from waterways;
3. Floodplain mapping;
4. Hazard mitigation planning;
5. Emergency management;
6. Buy-out programs; and,
7. Identifying projects within areas prioritized for flood risk reduction.

Priority actions are detailed, and when necessary, broken in multiple steps to provide direction on how actions can be achieved. In addition, potential funding sources and/or additional resources have been identified for priority actions. It should be noted that identified funding sources may have their own unique requirements (e.g., benefit-cost analysis, programmatic requirements); these requirements have been taken into consideration when possible.

In addition to priority actions, several additional actions have been identified. These actions were identified through the planning process, however given the County's current needs and capacity, may not be a priority relative to other actions. Identified actions (priority and otherwise) are further detailed below.

Priority Actions

1. Enhance Staff Capacity for Floodplain Management

Buchanan County currently has a limited capacity to conduct floodplain management activities, as described further in *Section 5: Capability and Capacity Assessment*. A county official dedicated to a floodplain manager role, with a CFM designation, would have the capacity and expertise for such activities.

Description	Timeline	Estimated Cost	Potential Funding Sources
Grow Buchanan County's ability to implement flood risk reduction measures by: 1) hiring a staff member who is a Certified Floodplain Manager (CFM) under the Virginia Association of Floodplain Managers, 2) having an existing staff member obtain the CFM designation, or 3) contracting out the position to a qualified firm. The CFM should act as a dedicated Floodplain Manager for the County and should also be identified as a lead to track the need for and implementation of flood risk reduction activities. The responsibilities of the CFM should include, but not be limited, to the following: 1) The tracking, application, and management of grants and awards allocated to Buchanan County for the purpose of flood risk reduction. 2) Implementation and enforcement of Buchanan County's Flood Damage Prevention Ordinance. 3) Act as a community resource for the National Flood Insurance Program (NFIP). 4) Participate in FEMA Risk Mapping, Assessment, and Planning (MAP) studies (i.e., updates to FIRMs and development of floodplain mapping products for Buchanan County). 5) Coordination with state and local agencies for the purpose of flood risk reduction activities. 6) Participating in the CPPDC Hazard Mitigation Plan Update as a representative from Buchanan County.	Through December 2023	For new hire or contract position: annual cost of staff salary and benefits, CFM maintenance For existing staff: cost of exam, study materials, and CFM maintenance	Funding for a staff member to obtain CFM designation was under 2021 CFPF award; County general funds

2. Debris Removal and Stream Restoration

The localized extreme rain and flood events of the past two years created tremendous damage to infrastructure and the environment. Much of the damage was caused by the incredible amount of debris that the floods moved through the valleys. The federal government administers grant programs to help local governments pay for debris removal and the repair or replacement of community facilities and public infrastructure. These grant programs, while helpful, require considerable expertise to successfully apply for and administer the funds. Many local governments hire on-call disaster recovery services contractors to provide the necessary expertise and staff needed to complete applications and maintain compliance with state and federal regulations. These contractors also assist with procurement for additional services such as debris removal and monitor those activities.

One of the largest disaster recovery federal grant programs is the Federal Emergency Management Agency (FEMA) Public Assistance (PA) Program, as authorized by section 406 of the Stafford Act. All FEMA PA grants come with an additional 5% for management costs (Category Z), which most local governments use to pay the disaster recovery services contractor. FEMA also provides additional funding as part of the PA program for hazard mitigation, so that recovery projects built using PA funds are more sustainable and resilient in the face of future, similar disasters. Finally, once FEMA PA funds are totaled, a percentage of those funds may be added and given to the state to manage and fund other types of hazard mitigation projects as part of the Hazard Mitigation Grant Program (HMGP) as authorized by section 404 of the Stafford Act.

This resilience action recommends Buchanan County hire a disaster recovery services contractor immediately to assist the County with securing FEMA, HUD, and other disaster recovery grants. The contractor must be hired immediately so that the County can meet the application deadlines for the FEMA PA funds approved for the July 2022 floods (4674-DR-VA).

Removing debris from the July 2022 floods is the highest priority. Following debris removal, stream restoration projects will be necessary to repair the creeks, re-establish proper flow, and provide natural flood mitigation and water storage where possible. The steps outlined below offer the County an action plan for hiring a contractor, removing debris, and beginning stream restoration projects.

Description	Timeline	Estimated Cost	Potential Funding Sources
Coordinate with Virginia Department of Environmental Quality (DEQ) to develop an Emergency Debris Management Plan. This plan may be integrated into the County's Emergency Operations Plan, and is intended to identify the following prior to an emergency event : ¹ Staff roles and responsibilities,	ASAP	\$50,000-\$100,000 (contracted out) or staff time to develop plan	County operating funds

¹ Virginia DEQ: Severe Weather Debris Management. Retrieved from [Severe Weather Debris Management | Virginia DEQ](#).

Description	Timeline	Estimated Cost	Potential Funding Sources
- Waste and debris collection methods (curbside pickup, citizen drop-off, etc.), - Potential locations for emergency debris management sites, - Waste management options (reuse, recycle, mulch, compost, landfill, etc.), - Resources needed (such as heavy equipment, fuel, or additional staff), - Contracted services for cleanup and monitoring (see next action), - Special procedures for private property demolition and debris removal, and - Plans for communicating information to the public.			
Hire a disaster recovery services contractor to manage Public Assistance and other recovery grant applications and administration. Recovery contractor will guide County in submitting applications to fund debris removal, pump station repairs, road and culvert repairs and other recovery projects. Recovery contractor may be paid with a portion of the 5% administration costs that accompany FEMA grants.	ASAP	Staff time to prepare RFP, advertise, and initiate a contract	County operating funds; PA Management Costs (Category Z)
Meet with FEMA Program Delivery Manager (PDMG) and establish what meetings (Recovery Scoping Meeting) have occurred and deadlines for project submittal. Discuss options for debris removal and stream restoration, including Natural Resources Conservation Service (NRCS) and United States Army Corps of	ASAP	Staff time to meet with recovery contractor and FEMA	County operating funds

Description	Timeline	Estimated Cost	Potential Funding Sources
Engineers (USACE) management of debris removal projects and stream restoration.			
Under direction of recovery contractor, complete Damage Inventory (DI), including detailed inventory of debris associated with the July 2022 storm (quantity and amount can be updated). Identify sources of debris and what debris was already removed.	ASAP	Staff time to contribute to damage inventory	County operating funds; PA Management Costs; NRCS Emergency Watershed Protection (EWP) funds; USACE Direct Federal Assistance (DFA) or Federal Operations Support (FOS) Mission Assignments
Under direction of recovery contractor, prepare and issue RFP for July 2022 storm debris removal. RFP should highlight requirement that contractor comply with all environmental regulations, including the Endangered Species Act and Clean Water Act in addition to FEMA debris removal requirements.	ASAP	Staff time to approve and post RFP	County operating funds; PA Management Costs
In coordination with recovery contractor and RES identify funding sources to assist property owners with debris removal not covered by FEMA PA	May - August 2023	Staff time for meetings	County operating funds
Compete debris removal projects	May-December 2023	25% of project costs	County operating funds, bonds, FEMA PA; NRCS Emergency Watershed Protection (EWP) funds; USACE Direct Federal Assistance (DFA) or Federal Operations Support

Description	Timeline	Estimated Cost	Potential Funding Sources
			(FOS) Mission Assignments
In coordination with recovery contractor and RES, identify projects to repair damage to streams and provide additional flood mitigation.	June 2023	Staff time to meet with recovery contractor and RES	County operating funds
In coordination with recovery contractor and RES, develop scopes of work and identify potential funding sources for stream restoration projects	June 2023	Staff time for meetings with RES	County operating funds
In coordination with RES and recovery contractor, apply for funding and complete projects to repair damage to streams	2024-2025	TBD	Grants - FEMA PA-Hazard Mitigation, FEMA-HMGP; Housing and Urban Development (HUD)-Community Development Block Grant (CDBG); NRCS Emergency Watershed Protection (EWP), Watershed and Flood Prevention Operations (WFPO), other funds; USACE Aquatic Ecosystem Restoration Projects (Section 206, other); Environmental Protection Agency (EPA) grants

3. Update County Flood Hazard Maps

Buchanan County's current flood maps (FIRMs) were developed over 25 years ago, in 1997. Further, while the 1997 study was countywide, certain stream reaches were not within the study boundaries. For instance, the stretches of Dismal Creek in the Whitewood/Jewell Valley that do not have mapped flood hazard area had extensive flooding and damages during the July 2022 flood event. Ideally, Flood Risk Data products should be developed for the entire county (e.g., Base Level Engineering (BLE)). BLE mapping would allow for maps that cover areas beyond the one square mile drainage area associated with traditional modeling and will allow for development of products such as depth and water surface elevation (WSEL) grids. In some studies, additional products such as velocity and particulate movement grids may be produced. Given the prevalence of structures in Buchanan County being washed downstream during flood events, depth and velocity grids could be used to better inform risk and could be incorporated into planning (e.g., Flood Damage Prevention Ordinance, transportation), building code updates, soil and erosion control, emergency management (e.g., evacuation planning), capital improvement planning, and decision-making. Further, flood risk products often include flood data for additional flood recurrence intervals other than the 100-year (1% annual) and 500-year (0.2%) events.

Description	Timeline	Estimated Cost	Potential Funding Sources
Work with the Virginia Floodplain Management Program (administered through the DCR) and FEMA Region 3 to have an updated county-wide flood study produced to replace current regulatory floodplain maps (FIRMs). Buchanan County is currently scheduled for a new flood study under the FEMA Risk MAP program, to begin in 2023. Draft maps are currently being completed in the northern portion of the county. DCR anticipates the first touchpoint with local leaders for the rest of the county, the Discovery Meeting, to be held prior to the end of the 2023 calendar year. An overview of the Risk MAP process is presented in Figure 7-1.	Discovery meeting to be scheduled prior to end of calendar year by DCR. Flood study estimated to be completed within 5 years.	Minimal cost to the County, includes staff time to participate in the flood study.	Flood study funded by FEMA Region 3
Prep for Discovery Meeting. Designate a County official to lead participation in the Risk MAP Discovery Meeting. This person should lead communication with DCR and FEMA Region 3 to understand opportunities for the County to participate in the floodplain mapping process. In addition, this person should be tasked with collecting the necessary data to successfully participate in the Discovery process. Flood data shared by the County will facilitate map products that more accurately represent flood risk. Data to	ASAP	Staff time to collect information and participate in meetings.	Flood study funded by FEMA Region 3

Description	Timeline	Estimated Cost	Potential Funding Sources
be shared includes, but is not limited to, high water marks, damage/claims information, areas of known risk, and local infrastructure data. The information collected during this planning process should be leveraged in during Discovery along with other local data and knowledge.			
Participate throughout the Risk MAP process. Opportunities for County officials to participate in the flood study process include: • Discovery (data gathering and information sharing; • Flood Risk Review Meeting (review draft floodplain data); • Resilience Meeting (plan for the future); and, • Consultation Coordination Officer (CCO) Meeting (review preliminary FIRMs and FIS).	2023 - 2028	Staff time to collect information and participate in meetings.	Flood study funded by FEMA Region 3
Adopt new flood data. Once the preliminary flood data completes its required 90-day appeal period and the County receives a Letter of Final Determination (LFD), the County must adopt or amend the Flood Damage Prevention Ordinance to reflect new regulatory maps within 6 months in order to remain compliant.	2025-2028	Staff time	Flood study funded by FEMA Region 3
Pursue additional flood risk products and/or studies, as necessary. If flood risk products outside of the standardized sets provided through the flood study (depths grids, WSELs, and changes since last FIRM (CSLF)) are desired to achieve targeted emergency management and planning needs, the County should pursue funding outside of the current FEMA Risk MAP study to develop these products. For example, the County may wish to pursue a Comprehensive Watershed-wide Drainage Study for the Whitewood area (part of the Upper Levisa Watershed) prior to the completion of the Risk MAP study, as the Whitewood area does not currently have mapped FEMA special flood hazard	1-10 years	Variable (>\$50,000)	CFPF; FEMA Mitigation Technical Assistance

Description	Timeline	Estimated Cost	Potential Funding Sources
areas. A drainage study could be used to identify locations where culverts may need to be upsized to accommodate current and/or future flows, and where other flood control measures would reduce risk. In certain instances, the County may adopt flood data developed outside of the Risk MAP program as “best available data.” Generally, this can be done in areas where there is no mapped FIRM available, or where the data being used as “best available” is more conservative than FIRMs.			



FEMA Risk MAP Process

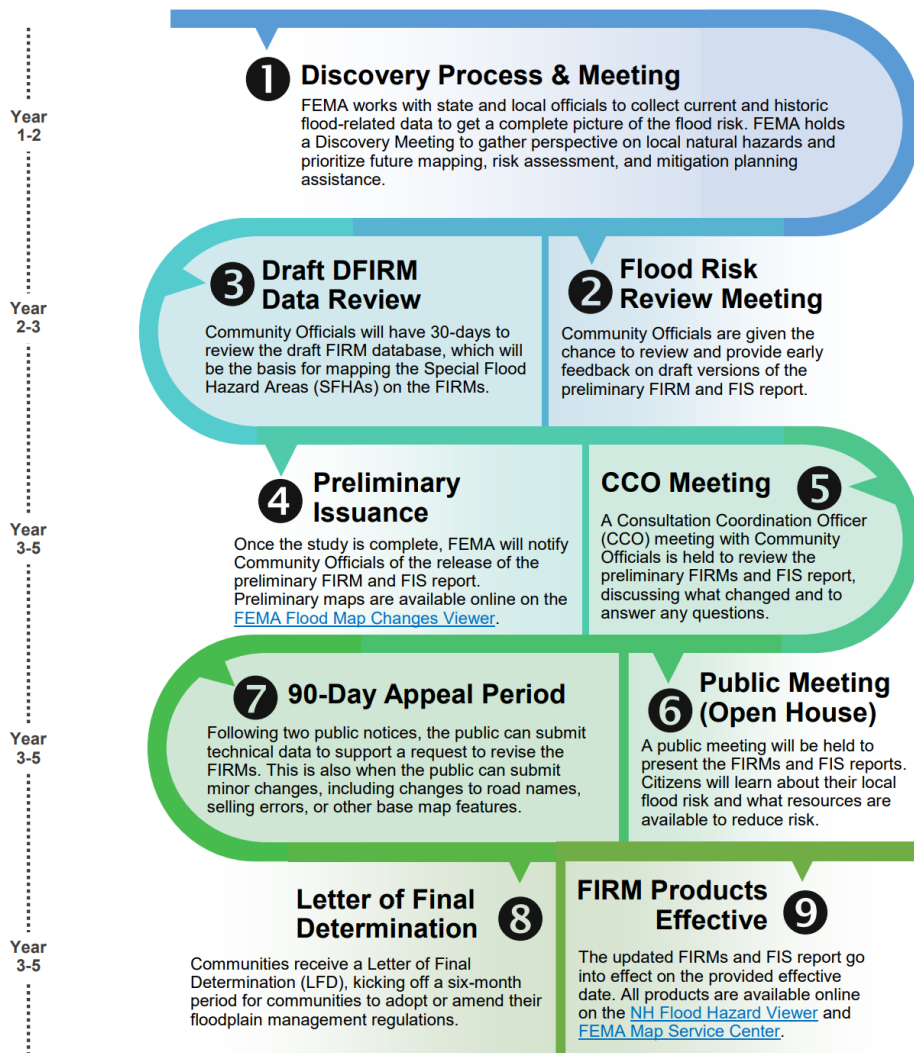


Figure 7-1: FEMA Risk MAP Flood Study Process

4. Hazard Mitigation Planning

Hazard mitigation planning reduces loss of life and property by minimizing the impact of disasters. It begins with state, tribal and local governments identifying natural disaster risks from all hazards and vulnerabilities that are common in their area. After identifying these risks, they develop long-term strategies for protecting people and property from similar events.

FEMA-approved hazard mitigation plans are required in order to be eligible for certain types of FEMA funding aimed at mitigating risk from natural hazards, including flooding. Hazard mitigation plans must be updated every five years and approved by the State and applicable FEMA region and adopted by the community in order to maintain eligibility. Types of FEMA grants requiring a community to have an approved hazard mitigation plan in place include:

- **Hazard Mitigation Grant Program (HMGP):** HMGP provides funding to state, local, tribal and territorial governments so they can develop hazard mitigation plans² and rebuild in a way that reduces, or mitigates, future disaster losses in their communities. When requested by an authorized representative, this grant funding is available after a presidentially declared disaster. Types of projects covered under HMGP include planning and enforcement, flood protection (e.g., acquisitions, levees, floodwalls, elevation, drainage improvements), retrofitting, and slope stabilization.³
- **Building Resilient Infrastructure and Communities (BRIC):** BRIC supports state, local, tribal and territorial governments as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. Projects covered under BRIC include planning/ordinance updates, building codes, flood control, drainage improvements, buy-out programs, stormwater management, nature-based solutions, and landslide mitigation, among others.⁴
- **Flood Mitigation Assistance (FMA):** FMA is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the [National Flood Insurance Program](#).

Buchanan County is currently eligible for these funds by participating under the CPPDC Hazard Mitigation Plan. However, this plan was last updated in 2018 and will expire this year, in 2023. Per information from the CCPDC, the District has requested FEMA funding in order to complete the plan update, however it is possible that the current plan will expire prior to an update being completed, approved, and adopted. The State Hazard Mitigation Officer (SHMO) can provide guidance for hazard

² Planning grants are available to communities without current, approved hazard mitigation plans in order to develop plans.

³ [Hazard Mitigation Grant Program \(HMGP\) | FEMA.gov](#)

⁴ [About BRIC: Reducing Risk through Hazard Mitigation | FEMA.gov](#)

mitigation planning. Two pathways for Buchanan County to maintain a current hazard mitigation plan are presented below.

Description	Timeline	Estimated Cost	Potential Funding Sources
Path A Work with CCPDC to complete the 2023 update of the CCPDC Hazard Mitigation Plan. This is dependent on the CPPDC obtaining funding for and completing the plan update. Buchanan County should designate an official to spearhead this effort. This individual should be tasked with: • Maintaining communication with CPPDC regarding plan updates and information (e.g., selection and award for funding to update the plan, plan schedule); • Participating on the hazard mitigation plan Planning Team; • Acting as a liaison between the CPPDC planning effort and Buchanan County, including notifying County officials and the public of opportunities to participate in plan development and supporting timely plan adoption by the Board of Supervisors; • Providing required information for the Buchanan County sections of the plan update, such as an updated critical facilities list, information of previous events and damages since last plan, and risk reduction actions or projects (also called mitigation strategies or actions). Much of this information can be leveraged directly from this flood resilience planning effort. Including this type of information in the hazard mitigation plan is essential – projects must be included in the plan’s mitigation strategy to be eligible for funding, and information on previous events and critical facilities can be pulled from the plan for use in grant applications.	2023 - 2024	Minimal cost to the County, includes staff time to participate in the planning process.	Hazard Mitigation Plan funded by FEMA via CPPDC

Description	Timeline	Estimated Cost	Potential Funding Sources
Path B Apply for funding to develop a standalone all-hazards mitigation plan for Buchanan County. It is recommended this path only be pursued if CPPDC does not undertake the effort to update their hazard mitigation plan, which is not anticipated. It is unlikely the County would be awarded FEMA funds (administered through the State) to complete a hazard mitigation plan if Buchanan County was included in an awarded scope under CPPDC's submitted application. Under this path, the County would need to apply for and be selected for funds and meet grant requirements throughout the planning process.	2024 - 2025	Staff time to complete plan OR approximately \$100,000 - \$200,000 if contracted out	HMGP; BRIC (excluding local match requirements); CFPF

5. Expand Emergency Management Capabilities

The two recent catastrophic flood events in Buchanan County reinforced the need to update the County's Emergency Operations Plan (EOP) and to create an Evacuation Plan, Continuity of Operations Plan (COOP), and Disaster Recovery Plan. The EOP provides a description of the roles, responsibilities, tasks, actions, and processes for integration with other departments and agencies. EOPs should be updated annually to respond to changing conditions. Newer EOPs follow the concept of operations presented in the National Response Framework (NRF) and the 15 Emergency Support Functions (ESF), which group and describe the kinds of resources and types of Federal assistance available to augment state and local response efforts. The ESFs cover topics such as communications, transportation, mass care, hazardous materials, and search and rescue. Topics addressed in evacuation plans include evacuation routes, timeframes, shelter locations, and communications. COOPs detail how and where the government will perform essential functions during and following an emergency event. Disaster recovery plans assess needs following an event and identify projects and programs to address those needs while making the community more resilient. These plans typically create redevelopment policies and activities focused on reducing hazard risk. Evacuation plans, COOPS, and disaster recovery plans can be stand-alone plans or integrated into the EOP. The steps below offer a path for the County to update the EOP and create an Evacuation Plan, COOP, and Disaster Recovery Plan.

Description	Timeline	Estimated Cost	Potential Funding Sources
With assistance from recovery contractor, apply for funding to support updating the County's Emergency Operations Plan (EOP) and creating an Evacuation Plan, Continuity of Operations Plan (COOP), and Disaster Recovery Plan.	June 2023-October 2020	Staff time to complete applications, local match	FEMA Emergency Management Performance Grant (EMPG) ⁵ , County operating funds
With assistance from recovery contractor, develop RFP and advertise for consulting services to update/create the County EOP, Evacuation Plan, COOP, and Disaster Recovery Plan.	August 2023	staff time to review, approve and post RFP	County operating funds
Update EOP and develop new plans.	September 2023-March 2024	\$200,000	FEMA EMPG, County operating funds
Develop evacuation route materials for communities across the county and educate the public on evacuation routes and procedures. Consider installing evacuation route signage.	April-June 2024	\$50,000	FEMA EMPG, County operating funds

Commented [BJ1]: what if they don't have one of those contractors? Can RES administer that through the CFPF grant?

Commented [BJ2]: same

⁵ <https://www.fema.gov/grants/preparedness/emergency-management-performance>

6. Explore Additional Buy-Out Programs and Opportunities

Buy-out programs are designed to remove structures with the highest risk of flooding out of harm's way. Often, these are homes or businesses that have flooded repeatedly in the past, or are within high-risk flood hazard areas, such as the floodway. Property owners typically participate voluntarily in such programs, and are paid market value for their property, giving them the opportunity to relocate to a lower risk area. The acquired structures are then removed, and the property is reverted to its natural state, which further reduces flood risk within the watershed by removing impervious cover and increasing capacity to store floodwaters.

Buchanan County has a current buy-out program in place through USACE. This program, called the Section 202 program (see Section 5: Capability and Capacity Assessment) made structures that flooded during the 1977 flood of record eligible for a buy-out. According to County officials, the program has been well-utilized, however there are structures within the county that have flooded one or more times in recent years that remain ineligible as they did not flood in 1977. Given the community's familiarity with the Section 202 buy-out program, there is potential for another program, targeted at properties not included under the Section 202 program, to be successful. Any potential buy-out program implemented by the County should consider equity and strive to make sure participants achieve a higher quality of life post buy-out.

A timeline is not provided for this action, as several other steps may need to be taken prior to undertaking this action, such as adopting the Flood Resilience Plan and adopting an updated hazard mitigation plan to be eligible for funding. Further, the County may wish to wait until updated FEMA flood maps and/or watershed drainage studies have been performed to achieve a better understanding of risk.

Description	Timeline	Estimated Cost	Potential Funding Sources
Select properties to be included in buy-out application: 1. Target highest risk properties. Consider structures that 1) are within FEMA special flood hazard areas (Zone A or Zone AE), with special consideration for properties within floodway; 2) have previously flooded (e.g., recipient of Individual Assistance (IA), prior NFIP claims, and have documentation of damages). Data documenting flood damages should be obtained. Structures within identified priority areas (see Section 6) may also be considered. 2. Once the highest risk properties are identified, work with property owners to understand interest/support for buy-outs.	N/A	Staff time to complete applications or completed as part of grant application assistance (see below)	County operating costs

Description	Timeline	Estimated Cost	Potential Funding Sources
3. Prioritize highest risk properties that were not eligible for a buy-out under the USACE Section 202 program. 4. Prioritize highest risk properties that have been identified as critical facilities (see Section 6). 5. Prioritize residential structures within socially vulnerable areas or those within low-income geographic areas. Properties housing socially vulnerable populations (such as the elderly or disabled) should be given special consideration. 6. Prioritize critical facilities (see Section 6). 7. Prioritize abandoned properties. Abandoned properties, especially those abandoned after sustaining damages during previous flood events, contribute to debris.			
Update / amend local comprehensive plan to include areas selected for buy-outs, with future land uses identifying these areas as natural or open space (e.g., floodplain restoration). *Best practice, can help achieve higher score under CFPF.	N/A	staff time to update comprehensive plan	County operating costs
Apply for buy-out funding. Assistance with grant application materials may need to be obtained (e.g., contracted out) to meet requirements. Each funding mechanism will have specific application criteria that will need to be met.	N/A	Buy-out program cost: \$1M+ Application assistance costs: \$5,000 - \$10,000 (potential for reimbursement through grant award)	FEMA HMGP; FEMA BRIC; CFPF; VDEM (excluding any local match requirements)
Once obtained, administer buy-out program and restore high risk properties to achieve floodplain restoration. Program should be administered in a manner that meets grant requirements. The County may wish to contract out the administration of the buy-out program.	N/A	Administered using funds awarded.	N/A (see above)

7. Identify Flood Risk Reduction Projects and Opportunities within Priority Areas

Section 6: Risk Assessment describes areas within Buchanan County that should be prioritized for risk reduction. These are areas with recorded flood impacts. In many of these areas, there are concentrations of structures and/or infrastructure within FEMA special flood hazard areas, including structures within the floodway (area of highest risk). In addition, these areas may house vulnerable populations or have high social vulnerability relative to other parts of state.

Description	Timeline	Estimated Cost	Potential Funding Sources
As opportunities are presented, identify and pursue flood risk reduction projects within areas prioritized for risk reduction. Such projects may include: • Property acquisition and/or relocation (e.g., buy-outs); • Structure, road, or bridge elevation; • Retrofitting (e.g., dry floodproofing, elevating utilities and mechanical equipment); • Hardening of critical facilities and infrastructure; • Construction of levees/floodwalls, storm sewers, detention/retention basins, or channel modifications; • Stream restoration; • Floodplain protection or preservation; and • Acquisition of temporary flood barriers or sandbags for deployment in priority areas. Actions 13-16, presented below, may present specific opportunities for reducing flood risk within priority areas. These opportunities should be considered as staff time, funding, or external opportunities permit.	Ongoing	N/A	CFPF; FEMA BRIC; FEMA HMGP; FEMA FMA

Additional Actions for Consideration

In addition to the seven priority actions detailed above, the following flood risk-reduction actions were identified during the planning process. These actions should be revisited as this plan is implemented and updated in the future.

Action No.	Action
Data Collection	
8	Expand and enhance the county's network of stream and rain gauges that update in real time and can provide warnings when flood stages are being approached. Rain gauges can be used to understand changes in the frequency and severity of extreme rainfall events. - Funding: Gauges are eligible for funding through CFPF. - Additional Resources: VDEM can assist the County with revamping the iFlows Program (Sarah Harrington is VDEM point of contact for this program).
9	Develop and maintain a system to track damages from flood events (to both private and public property).
10	Develop a High Water Mark program, which is a community awareness program to train volunteer residents to collect high water mark data after flood events. High water marks can be used to update flood studies (FIRMS) produced by FEMA and in post-disaster studies. High water marks can also be used to inform whether a flood event is a 100-year event or caused by something greater (such as a mine blowout) by comparing high water marks to base flood elevations and event rainfall totals. Additional Resources: the State Flood Data Intel Unit Manager, Steven Pile, can provide assistance with a High Water Mark Program.
11	Pursue funding to survey and map abandoned mines within the county. DMME provides locations of known abandoned mine lands, but it is incomplete and does not reflect risk throughout the county. Note: this is considered a low-priority action relative to other actions.
Public Education	
12	Develop a public education campaign for the following: - Response and evacuation procedures (e.g., evacuation routes, when to call 9-1-1); - Requirements under the Flood Damage Prevention Ordinance, including why compliance is important for maintaining good-standing in the NFIP. This can be timed with the adoption of the County's updated ordinance; - Permitting requirements for grading, drainage, and erosion control; - Opportunities for post-disaster assistance and how to access.
Property Protection	
13	Perform hydrologic and hydraulic (H&H) modeling in order to appropriately upsize culverts at identified pinchpoints in order to reduce flooding during extreme rainfall events, especially road-flooding. This should be completed after a watershed-wide drainage study is performed or new FEMA flood maps are available to achieve a watershed-wide approach to managing extreme rainfall events with consideration to future conditions. Pinchpoints identified during the planning process include: - Dismal River Road and Spruce Pine Road (high priority – culvert overtops every 2 years); - Slate Creek Road at Enochs Branch Road (road flooding near Heritage Hall);

Action No.	Action
	- Hurley Road at Lester's Fork Road (high priority); - Greenbriar Road and Lovers Gap Road (Vicey); and, - Riverside Drive and Garden Creek Road (Oakwood) (low priority relative to others).
14	Elevate section of Slate Creek Road at Heritage Hall. This area floods every 1-2 years and creates access issues (people cannot get to work or school, or get home).
15	Work with AEP to protect/harden the county's electrical system, particularly AEP substations that are impacted by flooding and landslides.
16	Relocate the water utility's SCADA building to an area not vulnerable to flooding that also has cellular service. The SCADA building was damaged during recent floods, and the temporary location currently being utilized does not have cellular service. Acquire a back-up SCADA server to be located on a separate site for redundancy.
Programs and Policies	
17	Consider joining the Community Rating System (CRS) to reduce flood insurance premiums for residents.
Emergency Response	
18	Explore opportunities to enhance cellular, radio, and broadband coverage in the Hurley / Guesses Fork area. Current gaps in coverage have caused gaps in emergency communication and information sharing, impacting preparedness and response, including evacuations.

Plan Implementation and Maintenance

The actions included in this section are intended to provide a near-term roadmap for Buchanan County to implement flood risk reduction measures. Going forward, it is recommended that the Planning Team meet annually (at a minimum) to review progress and discuss actions to be taken in the following year.

Further, while not required, it is recommended that the County update the Flood Resilience Plan every 5-10 years in order to reassess capability and capacity and flood risk and vulnerability, as well as understand the progress made toward implementation of actions identified during this planning process, and to identify new actions for flood risk reduction.